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PLANNING FOR THE FUTURE

JULY 2023

ENVIRONMENTAL IMPACT ASSESSMENT REPORT VOLUME 1 – MAIN BODY

KILDARE INNOVATION CAMPUS AT BARNHALL ROAD, LEIXLIP, COUNTY KILDARE.

PREPARED FOR:

THE DAVY PLATFORM ICAV FOR AND ON BEHALF OF THE LIFFEY SUB-FUND
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1.0 INTRODUCTION

1.1 Outline Details

This Environmental Impact Assessment Report (EIAR) relates to a project and planning application by The Davy Platform ICAV for and on behalf of the Liffey Sub Fund, (referred to as the Applicant throughout) for development that includes for the phased expansion of the existing Kildare Innovation Campus, allowing for a mix of Deep Tech, ICT and Innovation uses. This is referred to as the KIC Masterplan and includes all works subject to the application for consent, described on the public notices and included within the 'redline' boundary on the Site Layout Plan. The KIC Masterplan (i.e. the proposed development), the subject of the planning application, will include for the demolition of some of the existing buildings on site and construction of new buildings, an energy centre and replacement substation, significant public infrastructure including a new signalised intersection on Celbridge Road (R404), a new Public Link Road through the campus (between Barnhall Road and the new signalised intersection), a pedestrian/cycle overpass of the M4, pedestrian and cycle links through the site and along the designated protected view corridor, and supporting infrastructure. The project to which this EIAR relates also includes facilitation works which comprise uprating of existing 110kV power lines to the site and enhancement of the local gas network and connection to the site. The facilitation works which are described and assessed as part of the project in accordance with the requirement of the EIA Directive, do not form part of the development for which planning consent is sought. Future consents for the facilitation works will be required through EirGrid and GNI. A detailed description of the project is outlined in Chapter 2 of this EIAR.

The development site which is subject to the application for consent measures c. 72.23 ha and is principally bounded by: the M4 Motorway and Barnhall Meadows to the north; Cellbridge Road to the east; Barnhall Rugby Football Club to the south; and by grounds associated with Castletown House to the west.

The site comprises the existing Kildare Innovation Campus, which was formerly the Hewlett Packard Campus originally permitted in 1995 under KCC Reg. Ref 95923. The development site also encompasses lands within the ownership of Kildare County Council (KCC). A letter of consent from KCC for the application to be made is included with eth application documents.

Refer to Chapter 2 for a more detailed description of the site's location and context.

A Non-Technical Summary of the EIAR has also been submitted with this application.

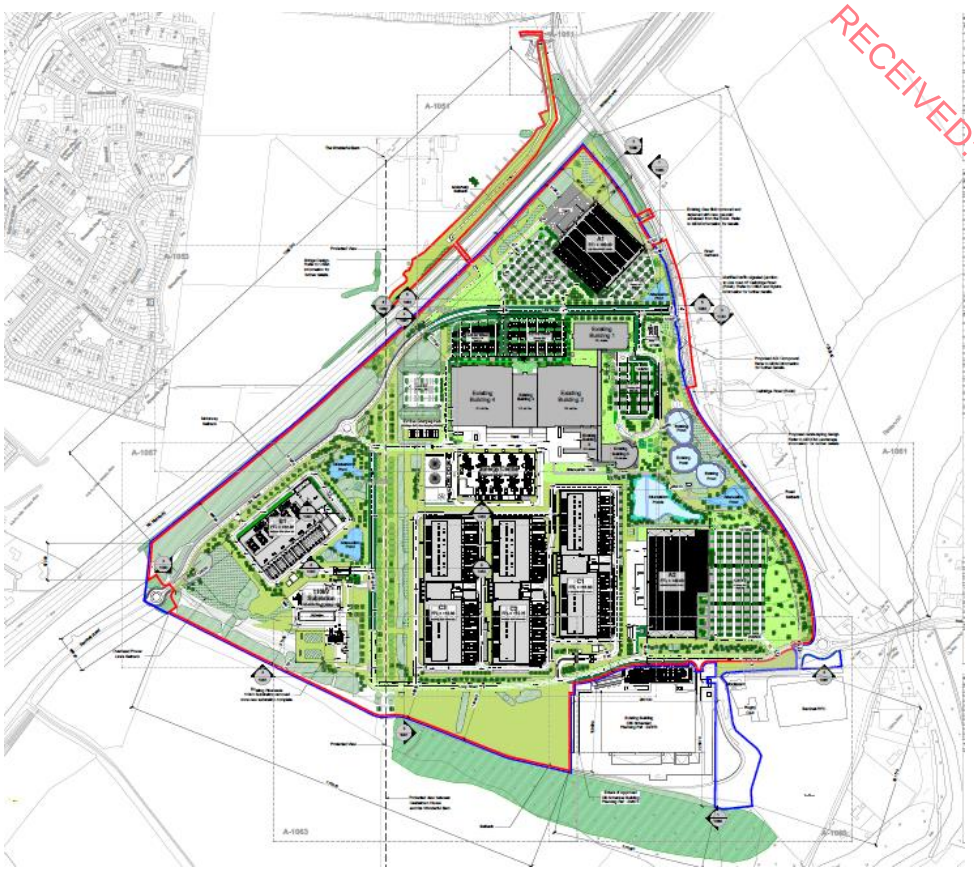


Figure 1.1: Site Layout Plan. Note that the 'Project' for the purposes of this EIA and EIAR contains 'facilitation' works outside the redline site boundary for which this planning application does not seek development consent. See Chapter 2 for full breakdown of the 'Project' works. (Source: RKD Site Location Plan, Drawing No. KIC-RKD-ZZ-ZZ-DR-A-1030)

1.2 EIA Process

The requirement for an environmental impact assessment (EIA) derives from, and is governed by, Directive 2011/92/EU of the European Parliament and Council of the 13th December 2011 on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of the European Parliament and Council of the 16th April 2014 (EIA Directive). The primary objective of the EIA Directive is to ensure that certain public and private projects that are likely to have significant effects on the environment by virtue of their nature, size or location are subjected to an assessment of their likely impacts prior to development consent being given.

Where a proposed project is of a type identified in the EIA Directive an EIA forms part of the planning consent process and is carried out by the planning authority. An EIAR is prepared by / on behalf of a Developer in respect of a project seeking planning consent. The EIAR thus becomes an integral informing element in the planning authority's EIA. Directive 2014/52/EU introduced strict requirements in respect of the competency of experts responsible for the preparation of the EIAR (see Section 1. below for details on the experts involved in the preparation of this document).

The EIA Directive was transposed into national legislation through the European Union (Planning and Development) (Environmental Impact Assessment) Regulations, 2018. These

Regulations amended the Planning and Development Act, 2000 with the insertion of a new part, Part X, into the Act, and the Planning and Development Regulations 2001 with the insertion of a new part, Part 10.

Section 171A of the Planning and Development Act, 2000, as amended, defines an EIA as follows:

'environmental impact assessment' means a process—

(a) consisting of—

(i) the preparation of an environmental impact assessment report by the applicant in accordance with this Act and regulations made thereunder,

(ii) the carrying out of consultations in accordance with this Act and regulations made thereunder,

(iii) the examination by the planning authority or the Board, as the case may be, of—

(I) the information contained in the environmental impact assessment report,

(II) any supplementary information provided, where necessary, by the applicant in accordance with section 172(1D) and (1E), and

(III) any relevant information received through the consultations carried out pursuant to subparagraph (ii),

(iv) the reasoned conclusion by the planning authority or the Board, as the case may be, on the significant effects on the environment of the proposed development, taking into account the results of the examination carried out pursuant to subparagraph (iii) and, where appropriate, its own supplementary examination, and

(v) the integration of the reasoned conclusion of the planning authority or the Board, as the case may be, into the decision on the proposed development, and

(b) which includes—

(i) an examination, analysis and evaluation, carried out by the planning authority or the Board, as the case may be, in accordance with this Part and regulations made thereunder, that identifies, describes and assesses, in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of the proposed development on the following:

(I) population and human health;

(II) biodiversity, with particular attention to species and habitats protected under the Habitats Directive and the Birds Directive;

(III) land, soil, water, air and climate;

(IV) material assets, cultural heritage and the landscape;

(V) the interaction between the factors mentioned in clauses (I) to (IV),

and

(ii) as regards the factors mentioned in subparagraph (i)(I) to (V), such examination, analysis and evaluation of the expected direct and indirect significant effects on the environment derived from the vulnerability of the proposed development to risks of major accidents or disasters, or both major accidents and disasters, that are relevant to that development;

The EIA process involves a number of steps and as per the methodology that is contained in the 2022 EPA EIAR Guidelines may be summarised as follows:

1. Screening – Is an EIA required?

2. Scoping – If an EIA is required, what aspects of the environment are likely to be significantly affected and should therefore be considered?

3. Preparation of an EIAR.

4. EIAR informs the EIA (as part of the consent process).

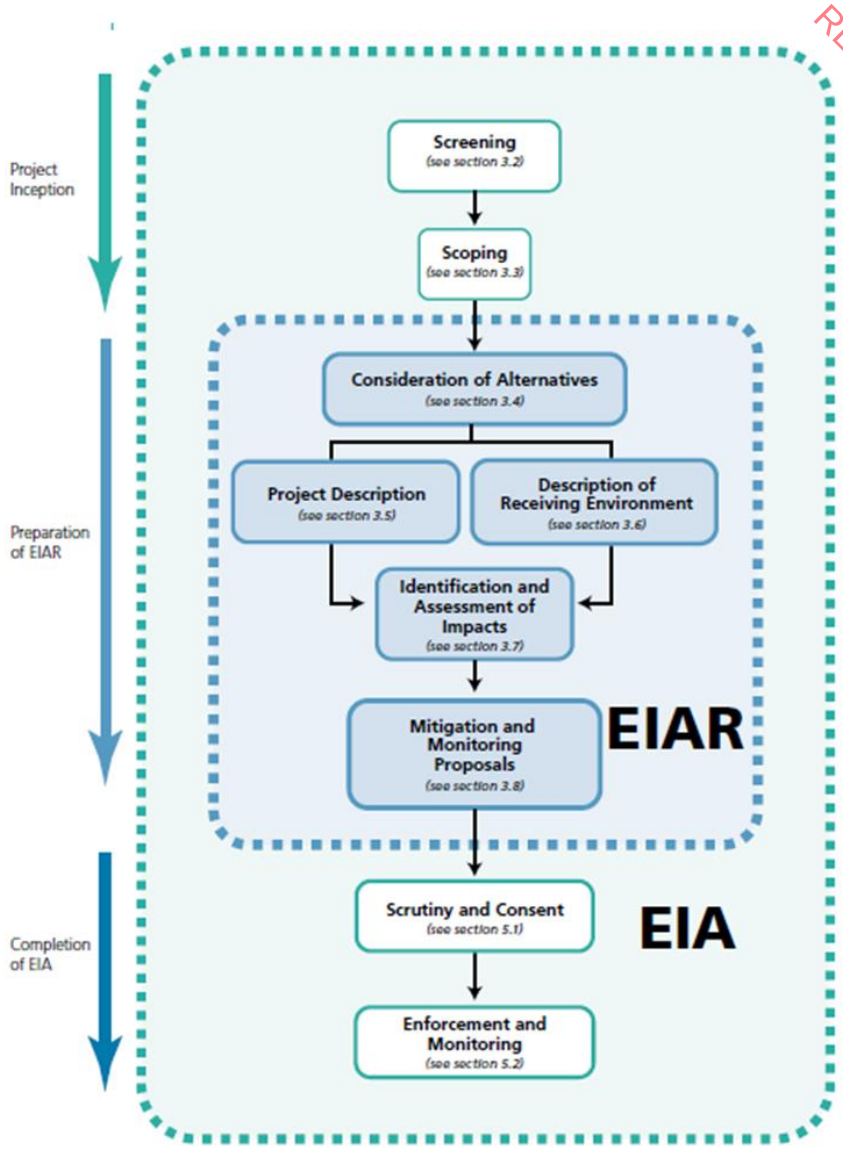


Figure 1.2: Flow chart illustrating the EIA Process. (Source: *Guidelines on the information to be contained in Environmental Impact Assessment Reports*, 2022, EPA; Figure 2.1.)

1.3 Need for EIAR

The EIA Directives list those projects for which an EIA is mandatory (Annex I) and those projects for which member states must provide a process to determine if it is likely to have significant effects on the environment (Annex II). This process may involve a case-by-case examination, the establishment of objective thresholds or other criteria, or a combination of these.

Annex I projects are listed in Part 1 of Schedule 5 of the *Planning and Development Regulations 2001* (as amended) ("the Regulations").

The project, the subject of this EIA, is not of a type listed within Part 1 of Schedule 5 of the Regulations and therefore a mandatory EIA is not required in this instance.

Annex II projects are set out in Part 2 of Schedule 5, together with specified thresholds above which a project must be subject to an EIA. The following class of project listed in Part 2 of Schedule 5 is relevant to the present project [OR Project]:

Class 10(b)(iv):

> *"Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and **20 hectares elsewhere**."*
>
> [Our emphasis.]

Having regard to the overall site area of the Project which is in excess of 73.95 ha, an EIA of the Project is therefore required.

1.4 Purpose and content of the Environmental Impact Assessment Report

An EIAR's purpose is to predict and assess likely significant effects (direct and indirect), if any, that the proposed project, if carried out, would have on the environment, on its own and in combination with other existing and /or approved projects. It is used during the consent process to inform EIA.

Article 5(1) and Annex IV of the EIA Directive, specifies the information to be provided in an EIAR. These requirements have been transposed into Irish law through Article 94 and Schedule 6 of the Planning and Development Regulations, 2001 (as amended).

Article 94 states:

> *"An EIAR shall take into account the available results of other relevant assessments under European Union or national legislation with a view to avoiding duplication of assessments and shall contain —*
>
> *(a) the information specified in paragraph 1 of Schedule 6,*
>
> *(b) any additional information specified in paragraph 2 of Schedule 6 relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected, and methods of assessment,*
>
> *(c) a summary in non-technical language of the information required under paragraphs (a) and (b),*
>
> *(d) a reference list detailing the sources used for the descriptions and assessments included in the report, and*
>
> *(e) a list of the experts who contributed to the preparation of the report, identifying for each such expert— (i) the part or parts of the report which he or she is responsible for or to which he or she contributed, (ii) his or her competence and experience, including relevant qualifications, if any, in relation to such parts, and (iii) such additional information in relation to his or her expertise that the person or persons preparing the EIAR consider demonstrates the expert's competence in the preparation of the report and ensures its completeness and quality."*

Schedule 6, Information to be contained in EIAR, provides as follows:

1. (a) A description of the proposed development comprising information on the site, design, size and other relevant features of the proposed development.

(b) A description of the likely significant effects on the environment of the proposed development.

(c) A description of the features, if any, of the proposed development and the measures, if any, envisaged to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment of the development.

(d) A description of the reasonable alternatives studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the proposed development on the environment.

2. Additional information, relevant to the specific characteristics of the development or type of development concerned and to the environmental features likely to be affected, on the following matters, by way of explanation or amplification of the information referred to in paragraph 1:

(a) a description of the proposed development, including, in particular—

(i) a description of the location of the proposed development,

(ii) a description of the physical characteristics of the whole proposed development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases,

(iii) a description of the main characteristics of the operational phase of the proposed development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used, and

(iv) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases;

(b) a description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects;

(c) a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without the development as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge;

(d) a description of the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment' in section 171A of the Act likely to be significantly affected by the proposed development: population, human health, biodiversity (for example fauna and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example

greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape;

(e) (i) a description of the likely significant effects on the environment of the proposed development resulting from, among other things—

(I) the construction and existence of the proposed development, including, where relevant, demolition works,

(II) the use of natural resources, in particular land, soil, water and biodiversity, considering as far as possible the sustainable availability of these resources,

(III) the emission of pollutants, noise, vibration, light, heat and radiation, the creation of nuisances, and the disposal and recovery of waste,

(IV) the risks to human health, cultural heritage or the environment (for example due to accidents or disasters),

(V) the cumulation of effects with other existing or approved developments, or both, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources,

(VI) the impact of the proposed development on climate (for example

the nature and magnitude of greenhouse gas emissions) and the vulnerability of the proposed development to climate change, and

(VII) the technologies and the substances used, and

(ii) the description of the likely significant effects on the factors specified in paragraph (b)(i)(I) to (V) of the definition of 'environmental impact assessment' in section 171A of the Act should cover the direct effects and any indirect, secondary, cumulative, transboundary, short term, medium-term and long-term, permanent and temporary, positive and negative effects of the proposed development, taking into account the environmental protection objectives established at European Union level or by a Member State of the European Union which are relevant to the proposed development;

(f) a description of the forecasting methods or evidence used to identify and assess the significant effects on the environment, including details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved;

(g) a description of 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 (for example the preparation of an analysis after completion of the development), explaining the extent to which significant adverse effects on the environment are avoided, prevented, reduced or offset during both the construction and operational phases of the development;

(h) 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.

This EIAR has been prepared in accordance with the requirements of Article 5(1) and Annex IV of the EIA Directive as implemented in Ireland through Article 94 and Schedule 6 of the Planning and Development Regulations, 2001 (as amended).

The preparation of this *Environmental Impact Assessment Report* has been co-ordinated by Tom Phillips + Associates, Town Planning Consultants[1], in association with other members of the Project Team as identified in Table 1.1 below. Details in respect of the competence of the various experts is set out in section 1.8.

1.5 Methodology adopted to identify, assess and describe potential significant effects.

The Environmental Protection Agency (EPA) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' (2022) (hereafter referred to as 'the EPA Guidelines') have the primary objective of improving the quality of EIARs with a view to facilitating compliance with the Directive. The environmental assessments for this project have evaluated the effects of the proposed project, and the likelihood, extent, magnitude, duration, reversibility and significance of any likely potential impacts of the proposed Project versus the current baseline.

Specific criteria for each technical discipline have been utilised, giving due regard to the following criteria from the EPA Guidelines:

- The magnitude and spatial extent of the impact (for example geographical area and size of the population likely to be affected);
- The nature of the impact;
- The transboundary nature of the impact;
- The intensity and complexity of the impact;
- The probability of the impact;
- The expected onset, duration, frequency and reversibility of the impact;
- The accumulation of the impact with the impact of other existing and/or approved projects; and
- The possibility of effectively reducing the impact.

In order to provide a consistent approach across the different technical disciplines addressed within the EIA, the following terminology will be used throughout the EIAR. This terminology has been adopted from the EPA Guidelines. Where individual environmental topics use different terminology due to specific guidance or legislative requirements, this will be described further in that section.

To define residual effects (i.e. the effect after the application of any required additional mitigation measures), the following terminology will be used:

[1] Tom Phillips + Associates, Town Planning Consultants, 80 Harcourt Street, Dublin 2, D02 F449

- Positive Effects – A change which improves the quality of the environment (for example, by increasing species diversity; or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
- 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).
- Neutral Effects – No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.

When addressing the duration of an effect, the following terminology will be used:

- 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 – Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

The extent and context of an effect will also be described as this can affect the perception of significance. These terms are defined as:

- 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?)

Where adverse or beneficial effects are identified, these will be assessed against the following scale:

- 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.

Finally, the probability of an effect should be defined to establish how likely it is to occur.

- 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.

1.6 Significance Criteria

For each technical EIAR chapter, the classification and significance of effects will be evaluated with reference to definitive standards, accepted criteria and legislation where available. Where it has not been possible to quantify effects, qualitative assessments will be carried out, based on professional opinion and professional judgement. Where uncertainty exists, this will be noted in the relevant EIAR chapter.

For each topic, the technical assessment will consider the magnitude of impacts and the sensitivity of the resources / receptors that could be affected in order to classify the effect. Each environmental factor and technical discipline will have its own method based on various standards and approaches, which will be detailed in a transparent and understandable way within the EIAR chapter.

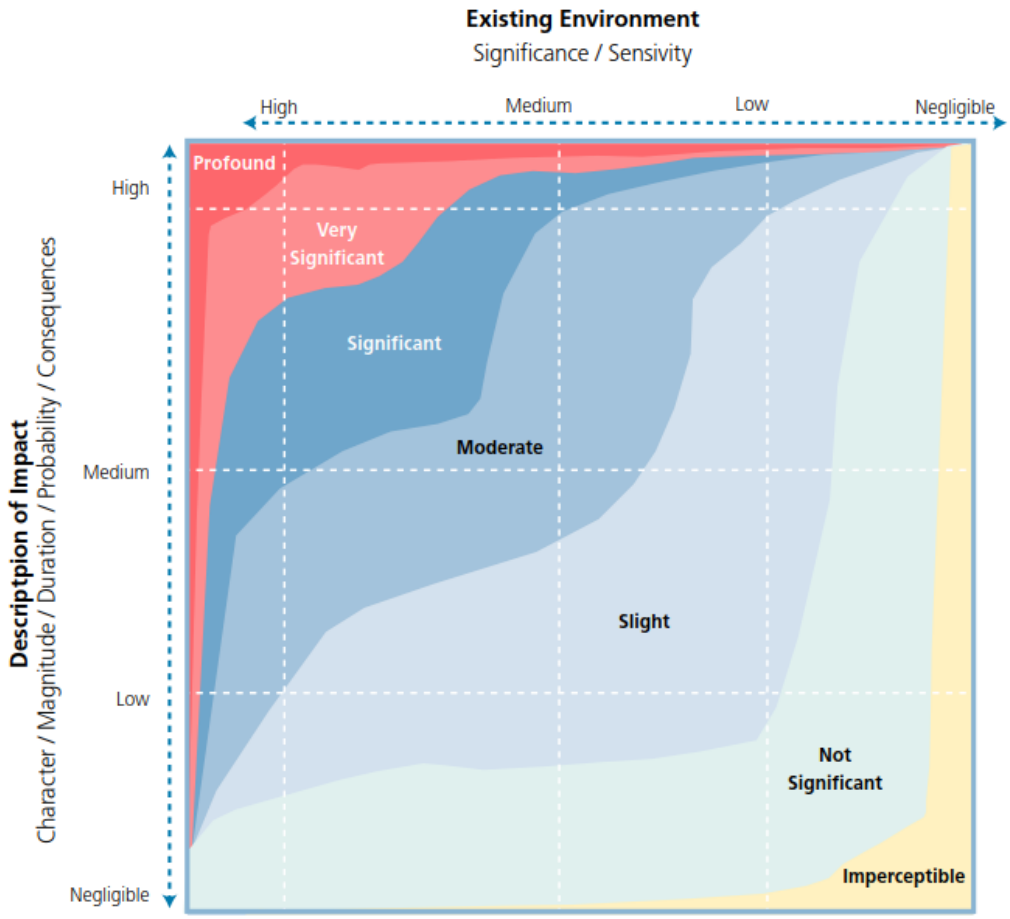


Figure 1.3: Determination of the Significance of an Effect (EPA, 2022)

In general, residual effects found to be 'significant', 'very significant' or 'profound' are deemed to be 'significant effects'. Effects found to be 'moderate' and 'slight' are considered to not be

significant effects 'Not significant' and 'imperceptible' effects are considered to not be significant.

1.7 Scoping of the Environmental Impact Assessment

All environmental factors outlined in the EIA Directive and the EPA *Guidelines on the information to be contained in Environmental Impact Assessment Reports*, May 2022 have been scoped into this Environmental Impact Assessment Report.

1.8 Consultation

To date and during the course of preparing the planning application which seeks consent for the principal works the Project Team has had strategic engagement with Kildare County Council, IDA Ireland, Eirgrid, Gas Networks Ireland, Kildare Chamber of Commerce, Barnhall Rugby Club, Salmon Leap Canoe Club, Weston Airport, Glenveagh, Office of Public Works (Castletown Estate), the 3rd Party Landowner of adjoining lands within Castletown estate and Transport Infrastructure Ireland (TII). Further to this, during the preparation of this EIAR, the EIAR project team have undertaken desktop scoping exercises through consulting the websites and published material of various statutory bodies including Kildare County Council (various internal departments including planning, environment, roads, drainage and conservation), Geological Survey of Ireland, National Parks and Wildlife Service, Inland Fisheries Ireland, National Heritage Office, National Monument Section (DOEHLG), Environmental Protection Agency (EPA), Commission for Regulation of Utilities (CRU), Transport Infrastructure Ireland (TII) and National Transport Authority (NTA).

It is noted that the name of the former HP site, then called Liffey Valley Business Park was re-branded in early April 2022 and its name changed to Kildare Innovation Campus (KIC) to coincide with a visit by the then Tánaiste and Minister for Trade, Enterprise & Employment Leo Varadkar, TD, for an IDA Ireland announcement of new jobs for the Campus.

In line with the requirements of the EIA Directive, as stated in Article 1(2)(ii) *"the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7"* following *"the preparation of an environmental impact assessment report by the developer"*.

As such, as required by the Planning and Development Act 2000 (as amended), the information contained within the planning application and the EIAR will be available to the public and the public will be given an opportunity to express their opinion on said information for a period of five weeks, which is in excess of the 30 days stipulated in Article 6(7) of the 2014 Directive.

In addition, the EIAR has been registered with the Department of Housing, Local Government and Heritage's EIA Portal.

1.9 EIAR Methodology and Format

In addition to the 2014 Directive, the subject EIAR has been informed by:

- Guidelines on the Information to be contained in Environmental Impact Statements (EPA, 2022);
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003);
- Draft Guidelines On The Information To Be Contained In Environmental Impact Assessment Reports (EPA, draft August 2017);
- Draft Advice Notes for Preparing Environmental Impact Statements, Draft, (EPA draft September 2015a);
- Draft Revised Guidelines on the Information to be Contained in Environmental Impact Statements (EPA draft September 2015b);
- Environmental Impact Assessment of Projects: Guidance on Screening (European Commission, 2017);
- Environmental Impact Assessment of Projects: Guidance on Scoping (European Commission, 2017);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment, (August 2018);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, May 2022;
- Guidance of Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Environment, Community and Local Government 2013);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Government of Ireland, 2018);
- Key Issues Consultation Paper on the Transposition of 2014 EIA Directive (2014/52/EU) in the Land Use Planning and EPA Licencing Systems (Department of Housing, Planning, Community and Local Government 2017);
- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (European Commission, 1999);
- Implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (European Commission, 2003);
- Circular PL 05/2018 -Transposition into Planning Law of Directive 2014/52/EU amending Directive 2011/92/EU on the effects of certain public and private projects on the environment (the EIA Directive) And Revised Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government, 2018)

The above is not a fully exhaustive list. The EIAR contributors have referred to heading-specific legislation, policy, and/or guidelines within each in individual EIAR Chapter.

EIARs require the assimilation, co-ordination, and presentation of a wide range of relevant information in order to allow for the overall assessment of a proposed development. To allow

for ease of presentation, and consistency when considering the various environmental factors considered, a systematic structure is used for the main body of the Report. The structure of the EIAR Chapters is outlined below.

1.9.1 Introduction and Project Description

The chapters of this EIAR introduce and describe the proposed development in sufficient detail to allow for a full assessment of the potential environmental effects.

1.9.2 Methodology

This section of each chapter outlines the methods used to describe the baseline environmental conditions and to predict the likely impacts on the environment of the proposed development during both the construction phase and the operational phase. The data and survey requirements for each chapter vary depending on the environmental topic and have been chosen by the particular specialist based on relevant legislation, best practice guidance, policy requirements, and professional judgement. Similarly, the study area is also defined for each environmental topic based on best practice guidelines, professional judgement, and experience.

All environmental topics require desk-based reviews of all relevant data at a minimum. These desk-based studies were then supplemented by field studies and consultations with relevant stakeholders, for example, interested parties, statutory bodies, and local authorities, as required for each environmental topic.

1.9.3 Baseline Scenario/Receiving Environment Analysis

This section provides a description of the current state of the environment related to the subject site, and a description of its likely evolution in the event that the Project is not implemented.

1.9.4 Likely Impact of the Project

This section allows for a description of the direct and indirect impacts that the project is likely to have on aspects of the environment affected. This section provides a list of the environmental topics affected by the Project. This is done with reference to both the *Project Description* and *Receiving Environment* sections, while also referring to the magnitude, duration, consequences (including use of natural resources) and significance of any impact.

1.9.5 Mitigation Measures and Monitoring of Impacts

This section provides a description of the measures envisaged to prevent, reduce and (where possible) offset any significant adverse impacts on the environment (for both construction and operational stages) that are practicable or reasonable, having regard to the potential impacts.

This section also outlines monitoring measures, where appropriate, in cases where significant adverse impacts have been identified.

1.9.6 Likely Cumulative and Interaction Impacts of the Project

This section allows for a description of the cumulative and interaction impacts that the project is likely to have on aspects of the environment affected. This is done with reference to both the *Project Description* and *Receiving Environment* sections, while also referring to the magnitude, duration, consequences (including use of natural resources) and significance of any impact.

For cumulative impacts of future developments in the surrounding area, Tom Phillips + Associates (TPA) have provided each Chapter consultant with a list of future developments in the surrounding area. The list was created by TPA's GIS specialist who filtered the Local Authorities' planning permission data sets to those within 5 km of the subject site.

That list was then filtered further – using professional town planning judgment – to eliminate applications such as extensions to dwellings or other minor developments unlikely to combine with the project to significantly impact the environment. The final list provided to each consultant is included as Appendix 1.1.

1.9.7 Mitigation Measures and Monitoring of Cumulative and Interaction Impacts

This section provides a description of the measures envisaged to prevent, reduce and (where possible) offset any significant adverse impacts on the environment (for both construction and operational stages) that are practicable or reasonable, having regard to the potential cumulative and interaction impacts.

This section also outlines monitoring measures, where appropriate, in cases where significant adverse cumulative and interaction impacts have been identified.

1.9.8 Major Accidents and/or Disasters

This section assesses the impacts from Major Accidents and/or Disasters. The EPA Guidelines, 2022, state that:

> *"To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other legislation e.g. a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment.*
>
> *The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g. the potential effects of floods on sites with*

sensitive facilities. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required."

The 2014 EIA Directive and associated EPA EIAR Guidelines requires that the vulnerability of the project to major accidents, and/or natural disasters (such as earthquakes, landslides, flooding, sea level rise etc.) is considered in the EIA Report. The site has been assessed in relation to the following external natural disasters; landslides, seismic activity and volcanic activity and sea level rise/flooding as outlined below. The potential for major accidents to occur at the facility has also been considered with reference to Seveso/COMAH. The results are presented in the relevant EIAR chapters and the overall impact is concluded as imperceptible.

1.9.9 Mitigation Measures and Proposed Response to such Emergencies

This section provides a description of the measures envisaged to prevent, reduce and (where possible) offset any significant adverse impacts on the environment (for both construction and operational stages) that are practicable or reasonable, having regard to the potential major accidents and/or disasters impacts.

This section also outlines the proposed response to such emergencies.

1.9.10 Residual Impacts

This section assesses the residual impacts of the project, which are the final predicted or intended impacts that occur after the proposed mitigation measures have been implemented. It will not always be possible or practical to mitigate all adverse effects.

Each Chapter of this EIAR clearly describes (in accordance with the standardised terminology set out in the EPA Guidelines, 2022) the residual impacts of the Project.

1.10 EIAR Study Team and Guarantee of Competency and Independence

1.10.1 EIAR Study Team – Roles and Responsibilities

This Environmental Impact Assessment Report was completed by a project team led by Tom Phillips + Associates, who also prepared a number of the chapters.

In accordance with EIA Directive 2014/52/EU, we confirm that the experts involved in the preparation of this EIAR are fully qualified and competent in their respective fields. Each has extensive proven expertise in the relevant field concerned, thus ensuring that the information provided herein is complete and of high quality.

Chapter	Aspects of the Environment Considered	Contributor	Person Responsible
Chapter 1	Introduction and Methodology	Tom Phillips + Associates (TPA)	Brian Minogue
Chapter 2	Site Location and Context	TPA	Brian Minogue
Chapter 3	Description of the Proposed Development	TPA	Brian Minogue
Chapter 4	Key Alternatives Considered	TPA	Brian Minogue
Chapter 5	Population and Human Health	TPA	Gavin Lawlor
Chapter 6	Biodiversity	Ecology Ireland	Gavin Fennessy Maire Kearns
Chapter 7	Land, Soils and Ground Water & Hydrogeology	AWN	Teri Hayes Alan Wilson
Chapter 8	Hydrology	AWN	Teri Hayes Alan Wilson
Chapter 9	Air	AWN	Dr. Edward Porter
Chapter 10	Climate	AWN	Dr. Edward Porter
Chapter 11	Noise and Vibration	AWN	Mike Simms
Chapter 12	Material Assets – Waste (Construction and Demolition)	AWN	Chonaill Bradley
Chapter 13	Material Assets –Traffic and Transportation	SYSTRA	Sheelagh McGuinness
Chapter 14	Material Assets – Site Services incl Energy Demand	TPA, CSEA, MDM Engineering, Ethos Engineering & H&MV Engineering	Brian Minogue
Chapter 15	Archaeology, Architecture & Cultural Heritage	Shanarc Archaeology & Mesh Architecture	Sean Shanahan / Tom McGimsey
Chapter 16	Heritage, Townscape, Landscape Visual Impact Assessment	AECOM	Joerg Schulze
Chapter 17	Major Accidents & Disasters	AWN	Matthew Michie
Chapter 18	Interactions and Cumulative Impacts	TPA	Brian Minogue
Chapter 19	Mitigation	TPA	Brian Minogue

	Non – Technical Summary	All Contributors outlined above - compiled by TPA	All Contributors outlined above - compiled by TPA

Table 1.2: EIAR Chapter Headings and Contributors

1.10.2 EIAR Team - Qualifications

Brian Minogue, (*TPA Town Planning Consultants)*
Qualifications: BSc in Spatial Planning.

Gavin Lawlor, (*TPA Town Planning Consultants)*
Qualifications: Master of Regional and Urban Planning – University College Dublin

Gavin Fennessy, *(Ecology Ireland Wildlife Consultants Ltd.)*
Qualifications: (BSc PhD MCIEEM)

Marie Kearns, *(Ecology Ireland Wildlife Consultants Ltd.)*
Qualifications: (BSc MSc)

Dr. Edward Porter, *(AWN Consulting Limited)*
Qualifications: BSc from the University of Sussex (Chemistry), and a PhD in Environmental Chemistry (Air Quality) in UCD

Mike Simms, *(AWN Consulting Limited)*
Qualifications: BE MEngSc MIOA MIET

Teri Hayes, *(AWN Consulting Limited)*
Qualifications: BSc MSc PGeol EurGeol

Chonaill Bradley, *(AWN Consulting Limited)*
Qualifications: BSc

Sheelagh McGuinness, *(SYSTRA Ltd.)*
Qualifications: B.Eng (hons) MBA

Grace Fegan, (Shanarc Archaeology Ltd)
Qualifications: B.A. Archaeology, M.A. Museum Studies

Tom McGimsey, *(Mesh Architecture)*
Qualifications: BArch, MSc Historic Preservation, RIAI Conservation Grade 1

Joerg Schulze, *(AECOM)*
Qualifications: MChem and a MSc (Physical Chemistry)

Matthew Michie, *(AWN Consulting Limited)*
Qualifications: MChem and a MSc (Physical Chemistry)

1.12 Additional Assessments Required

This section addressed the additional approvals and assessments required under other EU Directives and legislation.

- EPA Greenhouse Gas (GHG) Emissions Permit – the proposed development will require a permit under the Greenhouse Gas Emissions Directive (2003/87/EC).
- Appropriate Assessment Screening Report – a screening report has been completed for the proposed development, as required under the Habitats and Birds Directive (92/43/EEC and 79/409/EEC), the results of which are presented in Chapter 6 (Biodiversity).
- Flood Risk Assessment - A Flood Risk Assessment for the site has been undertaken for the facility and is appended to Chapter 8 Hydrology and Hydrogeology.
- Industrial Emissions Directive (IED) licence – as the thermal input of the facility as a whole will exceed 50MW, it is anticipated that the development will require an IED licence in accordance with the Industrial Emissions Directive (20120/75/EU). An application to the EPA will be submitted post planning.

1.13 The Developer

The development is proposed by The Davy Platform ICAV for and on behalf of the Liffey Sub Fund.

2.0 DESCRIPTION OF THE PROJECT

2.1 Introduction

This chapter of the *Environmental Impact Assessment Report* has been prepared by Brian Minogue (BSc in Spatial Planning), Tom Phillips + Associates in conjunction with the project team. In accordance with Directive 2011/92/EU of the European Parliament and Council of the 13th December 2011 on the assessment of the effects of certain public and private projects on the environment as amended by Directive 2014/52/EU of the European Parliament and Council of the 16th April 2014 (EIA Directive), it provides a detailed description of the project, together with details of the existing environment surrounding the site.

The detail required in describing the project is elaborated on in ANNEX IV of the EIA Directive as transposed in the Planning and Development Regulations 2001 to 2022 in Schedule 6 thereof where at paragraph 2(a) it states:

(a) a description of the proposed development, including, in particular—

(i) a description of the location of the proposed development,
(ii) a description of the physical characteristics of the whole proposed development, including, where relevant, requisite demolition works, and the land-use requirements during the construction and operational phases,
(iii) a description of the main characteristics of the operational phase of the proposed development (in particular any production process), for instance, energy demand and energy used, nature and quantity of the materials and natural resources (including water, land, soil and biodiversity) used, and

(iv) an estimate, by type and quantity, of expected residues and emissions (such as water, air, soil and subsoil pollution, noise, vibration, light, heat, radiation) and quantities and types of waste produced during the construction and operation phases;

The following chapter presents a description of the project as required by the relevant planning legislation and guidance below:

- EIA Directive (2011/92/EU), as amended by the 2014 EIA Directive (2014/52/EU) (herein referred to as the EIA Directive)
- The Planning and Development Regulations 2001 to 2022 (as amended);
- European Commission *'Environmental Impact Assessment of Projects – Guidance on the preparation of Environmental Impact Assessment Report'* (2017)
- EPA *'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports'* (2022), and
- EPA Draft *'Advice Notes for Preparing Environmental Impact Statements'* (2015).

2.2 Characteristics of the Project

The project, subject to this EIAR includes two separate but interrelated streams of proposed works:

A. The 'principal' works subject to the development consent being sought from Kildare County Council, i.e. the proposed development; and

B. 'Facilitation works' required to support the development which do not form part of the development consent being sought from Kildare County Council. The facilitation works include a mix of works that will be required to be undertaken for or on behalf of statutory undertakers such as Gas Networks Ireland and EirGrid.

The principal works include the proposed expansion of the existing innovation campus and all those works included within the redline boundary and described on the statutory notices accompanying the application. The facilitation works are those known works that are required to facilitate the proposed development over the life of the permission being sought.

2.3 Location of the Project Site

2.3.1 Principal Works Site (Works within Planning Application Red Line Boundary)

The development site is located in County Kildare close to the border with County Dublin and measures approximately 72.23 ha, inclusive of 1.83 ha of lands within the ownership of Kildare County Council (KCC).

The campus is principally bounded by: the M4 Motorway (and Barnhall Meadows and Wonderful Barn lands) to the north; Cellbridge Road to the east; Barnhall Rugby Football Club and recently completed DB Schenker logistics facility to the south; and by grounds associated with Castletown House to the west.

The site comprises the existing Kildare Innovation Campus, which was formerly the Hewlett Packard Campus originally permitted in 1995 under KCC Reg. Ref 95923.

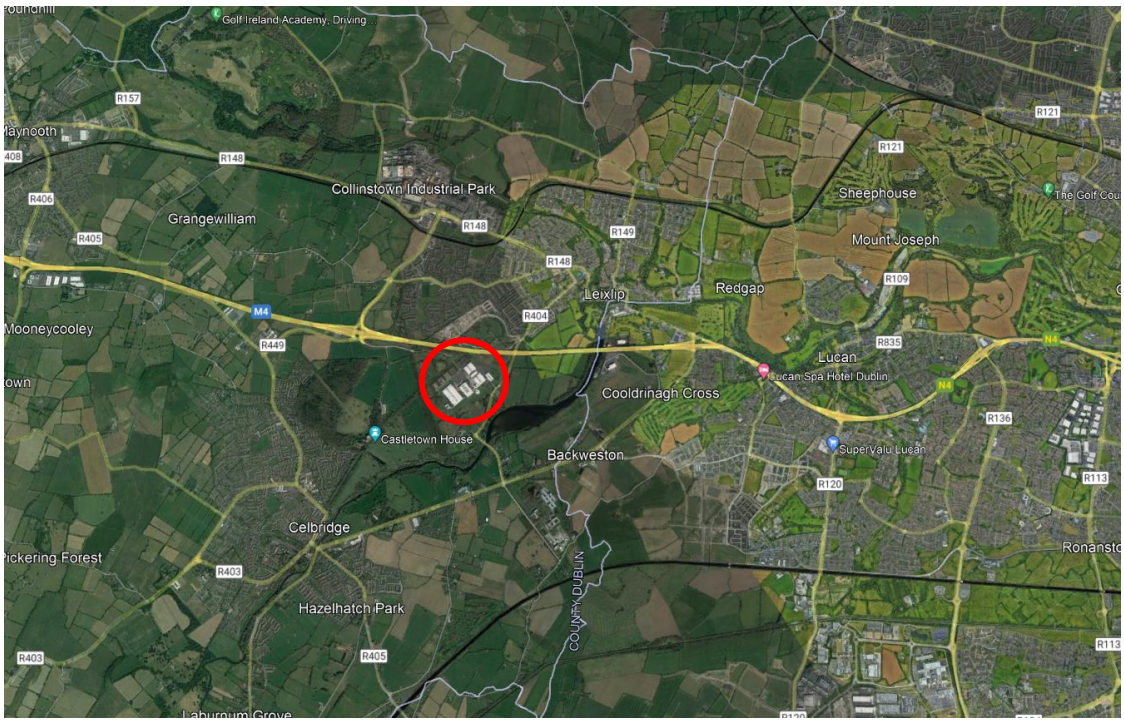


Figure 2.1: Site Location. (Source: Google Earth; annotated by TPA.)

Figure 2.2: Site Context. (Source: RKD Architects.)

The surrounding uses are chiefly enterprise and employment, infrastructural/transport, agricultural, cultural, recreational, and residential.

The nearest sensitive receptors are new housing estates c. 150m across the M4 Motorway to the north of the campus including Barnhall Meadows, which has been constructed in phases between 2019 and 2022. There are also a number of private residences on the opposite side of Celbridge Road to the west.

The site is currently accessed from Barnhall Road to the west and Celbridge Road (R404) to the east and has proximate connections to the M4, accessed through Barnhall Road. A third access point to the campus is provided off the Roundabout on Celbridge Road and currently provides access to DB Schenker principally.

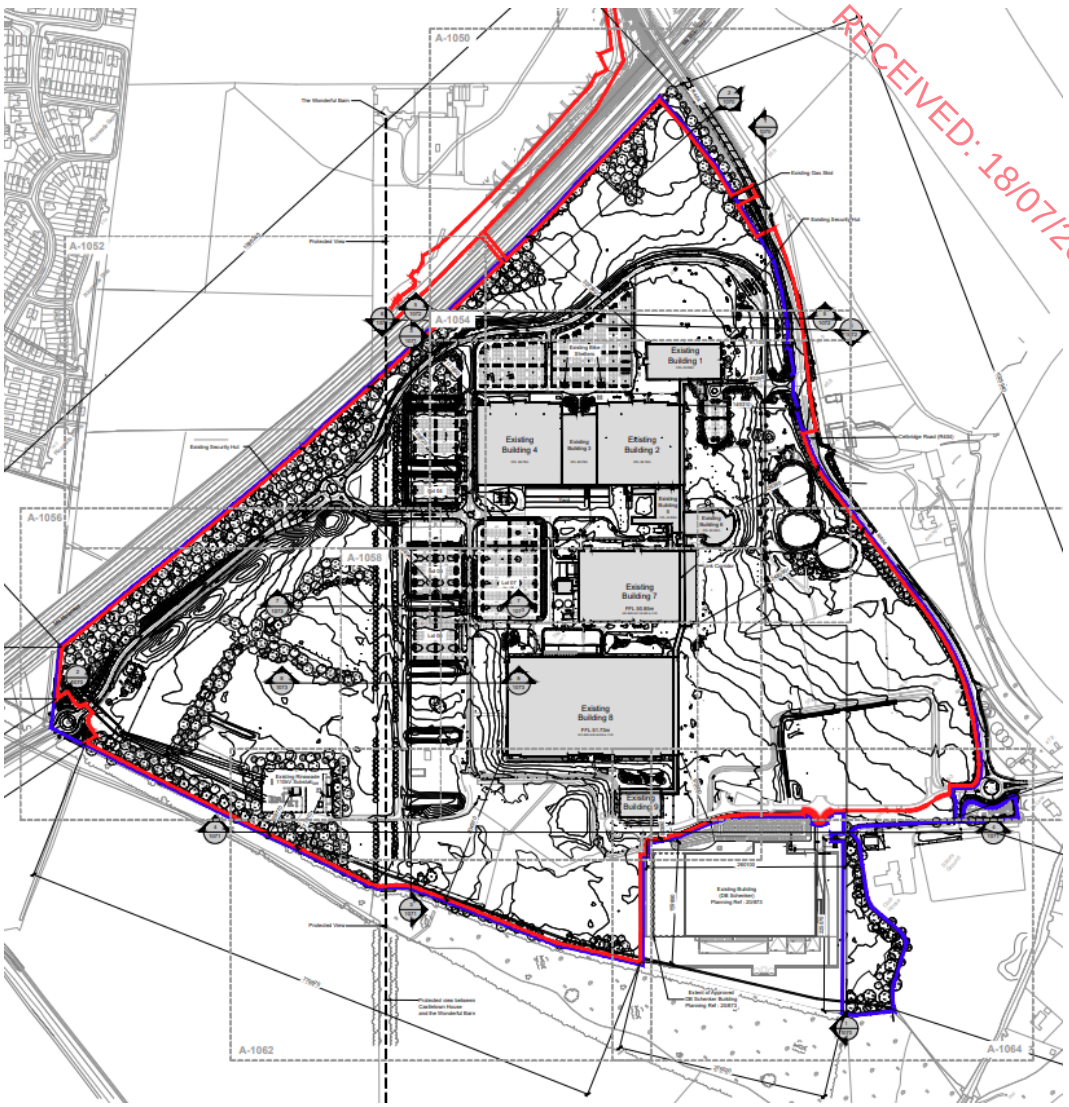


Figure 2.3: Existing Site Location Plan (the Principal Works Site is the red line boundary). (Source: RKD.)

2.3.2 Facilitation Works Site (Works outside Planning Application Red Line Boundary)

'Facilitation works' have been identified as being required to support the development consent being sought from Kildare County Council. The planning application to KCC does not encompass a request for development consent in relation to the facilitation works.

The facilitation works include a mix of works that will be required to be undertaken for or on behalf of statutory undertakers such as Gas Networks Ireland and EirGrid. The location of the facilitation works are described as follows:

2.3.3 GNI Gas Upgrades

The GNI upgrades will be delivered through a local upgrade of the gas network over a length of approximately 1.5km through predominantly residential areas and are required to facilitate Phase 1 of the project. The route of the upgrades will be along Ryevale Lawns along Station Road, Old Hill and Celbridge Road (R404) up to the entrance of Barnhall Meadows (Figure 2.4). The pipe will run under the existing road pavement. The route will run along Celbridge Road to Station Road running adjacent to entrances to Barnhall Meadows, Leixlip Park, Eton Ct., Sycamore Avenue, Forest Park, Castletown, Wogansfield, Highfield Park, Knockaulin, Ryevale lawns and Cedar Park residential areas. Celbridge road also serves Barnhall Shopping Centre, Maxol garage, Colaiste Chiarain school and Scoil Chearbhaill Uí Dhálaigh. It will also run under Station Road which serves Leixlip Garda station. At the entrance to Barnhall Meadows, the pipe will run underground through the Barnhall Meadows lands (adjacent to the existing haul road, east of the Wonderful Barn allotments) and will then cross the M4 Motorway through Horizontal Directional Drilling and enter the Kildare Innovation Campus then connecting to the proposed Gas Skid. The route will not pass through any environmental features. The nearest watercourse to the route is the river Liffey which runs parallel to the route approx. 860m to the east and joins Leixlip Reservoir which is located approx. 320m to the south of the pipeline.

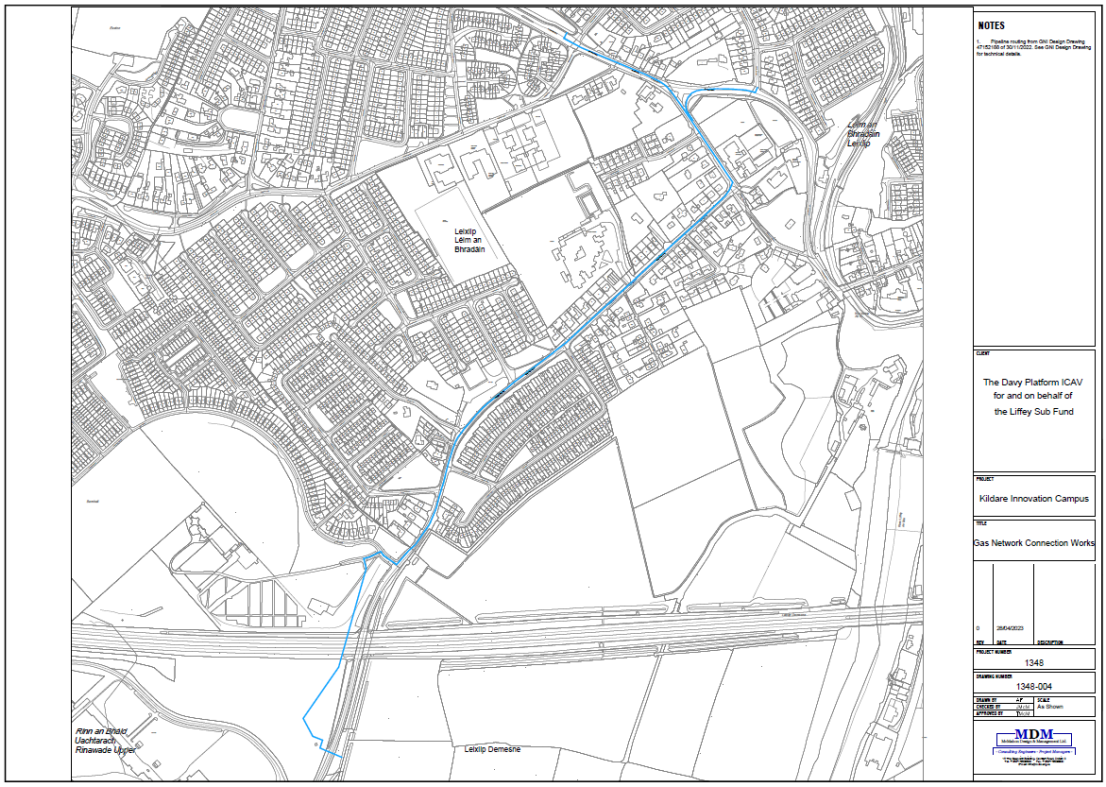


Figure 2.4: Indicative Route for Upgraded Gas Connection. Source: MDM Engineering Drawing No. 1348-004 (Refer to Appendix 2.1).

EirGrid Uprating

To facilitate Phase 3 of the proposed development uprating of existing overhead lines (OHLs) from the replacement 110kV Rinawade substation[1] to Derryiron/Maynooth and Dunfirth/Kinnegad will be required to facilitate commencement of Phase 3 of the KIC

[1] For the avoidance of doubt it is noted that the replacement substation is part of the development for which consent is sought and not part of the facilitation works

Masterplan. The uprating will be carried out to existing lines along established wayleaves primarily traversing agricultural lands. A more detailed description of the locations associated with each stage of the Upgrades is included below:

This uprating would occur in four stages identified as follows:

Stage	Line to be Uprated	Identified Works	Line Replacements
Stage 1	Maynooth to Rinawade	7.1km Power lines 100% DC tower review, conductor replacements	mixture of 200 mm², 300mm² and 430mm²
Stage 2	Dunfirth/Kinnegad to Rinawade	50km of Power line Poleset, Angle towers and 5km DC tower review, conductor replacements	mixture of 200 mm², 300mm² and 430mm²
Stage 3	Statcom	150 MVAr STATCOM at Rinawade	
Stage 4	Derryiron to Maynooth	43km of Power lines – Poleset and Angle Tower reviews	430mm² (Station equipment to be upgraded)
Stage 5	Derryiron – Kinnegad	15.1km - Poleset and Angle Tower reviews	mixture of 200 mm², 300mm² and 430mm² (TBC)

Table 2.1: Identified Line Uprating

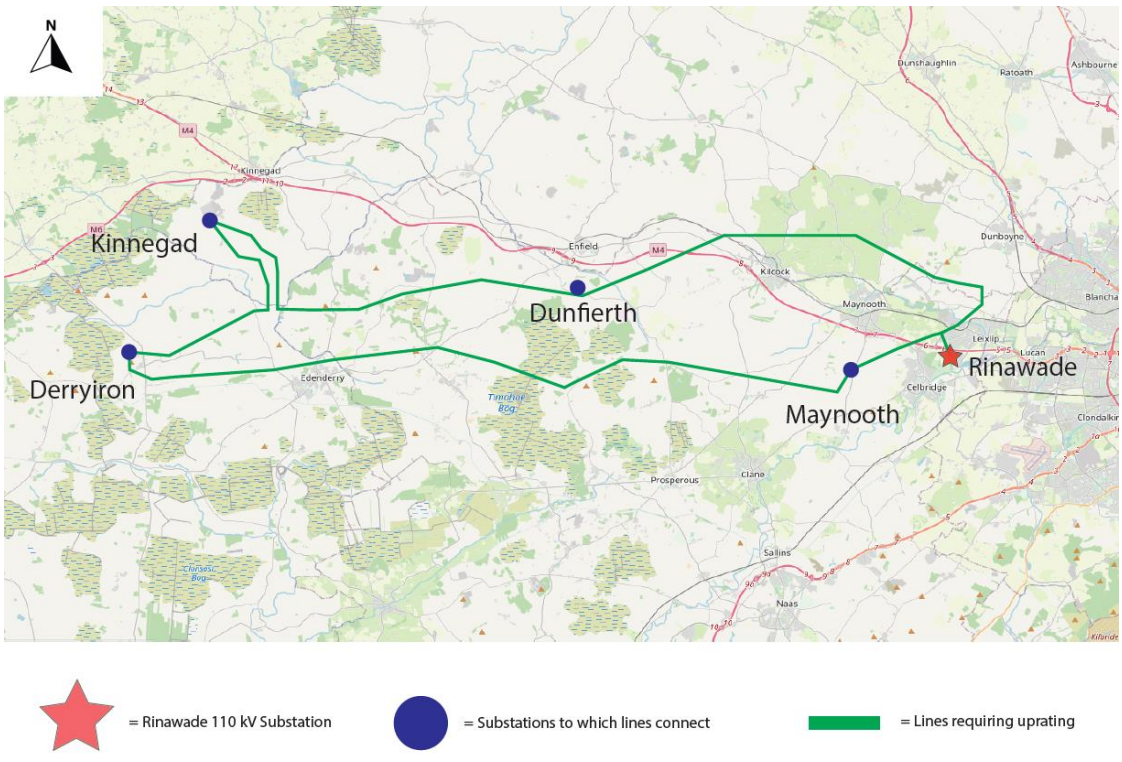


Figure 2.5 - Map of Existing 110KV OHL routes requiring uprate to facilitate the KIC development.

Stage 1 – Maynooth to Rinawade

In terms of the stage 1 uprate the works would occur along the existing line beginning at the Rinawade substation to the west of the existing Kildare Innovation Campus heading north across the M4 and traversing suburban residential areas in Kilmacredock and Easton

Meadows. The route of the existing line then moves west across the R449 and veers south westerly towards the Maynooth substation, again traversing the M4 and the R405 south of this. Lands are largely agricultural with various other uses along the route including Celbridge Community School, light industrial and commercial buildings at the M4 Business Park and Corbally stud. The Myplan.ie mapping service indicates 2 National Monuments located approximately midway between Corbally Stud and the M4 Business Park, as well as a cluster just north of the M4 along the route. The route does not appear to traverse any designated European Sites or Flood Zones.

Stage 2 – Kinnegad to Rinawade

Uprate works would again occur along this existing route beginning at the Rinawade substation adjacent to the KIC. The route carries in a north easterly direction, crossing the main Dublin – Sligo rail line and traversing the Collinstown Industrial Estate (Intel Campus) on the western outskirts of Leixlip. Just north of the Collinstown Estate the line traverses the Rye Water Valley/ Carton Special Area of Conservation (SAC) after which it moves into largely agricultural lands and crosses into Co. Meath. The route then moves in a west north westerly direction and passes along the south of the R&R Golf Course and the village of Kilcloon for a distance of approx. 7km. The route of the existing line then shifts due west for a further 7km where it re-directs in a south westerly direction and traverses the Royal Canal. The line continues for a 9km stretch crossing the R148, M4 and local roads before connecting into Dunfierth 110Kv substation.

Stage 4 – Derryiron to Maynooth

This 43 km phase of uprate works will occur in a corridor stretching in a largely east – west direction between the Derryiron power station and Maynooth substation. Notable features along the route include the Timahoe Bog, a cluster of National Monuments at Carbury Hill near Edenderry, the town of Edenderry, Co. Offaly, the village of Rhode. A section of the line between Edenderry and Rhode carries parallel to the north of the Grand Canal.

Stage 5 – Derryiron to Kinnegad

Includes for uprating of existing lines along a 15km stretch incorporating predominantly agricultural lands and crossing between Co's Offaly and Meath, terminating at the Kinnegad substation located within the Breedon Cement Works compound.

2.4 Existing Site Description

2.4.1 Principal Works Site

The campus comprises 9 No. Buildings. Development of those buildings first commenced in c. 1995, by Hewlett Packard Ltd, comprising a facility to produce inkjet cartridges for use in computer printers. Prior to the site being an ink jet manufacturing facility, the site was used by Irish Meat Packers as a meat plant, but that use had long been abandoned by the time Hewlett Packard acquired the site.

Over time Hewlett Packard transitioned most of their operations out of the facility with new tenants introduced.

The site now chiefly comprises a business/innovation campus, which employs c.1,100 No. people in industries including manufacturing, office, distribution, welfare and utilities.

Figure 2.6: View of the Campus from the Wonderful Barn to the North. (Source: Innovision.)

The buildings are on average c. 10-21 m in height and with a total existing gross floor area of 127,700 sq. m.

The buildings are accessed via an internal road network, which itself has access to the public road network from Barnhall Road to the west and Celbridge Road to the east. (There is a recently permitted (Reg. Ref. 20/873) and built access point to the south, which provides access to *inter alia* the DB Schenker logistics facility located external to the site boundary.)

Figure 2.7: View of the Campus (and DB Schenker (left of image)) from the R404. (Source: Innovision.)

There are 8 No. car parks providing parking for the buildings. In total, there is c. 86,029 sq. m of hardstanding within the campus.

There is soft landscaping around the buildings and hardstanding areas. Further out around the buildings, the campus comprises a series of hedgerows and tree lines within and around the site boundary.

In addition, there is a protected view that passes through the site, which consists of two rows of trees planted as part of the previous Hewlett Packard (HP) development of the site. The view corridor provides views to the Wonderful Barn to the north (located outside the site boundary), which is a protected structure (RPS. No. B11-15).

Figure 2.8: View from the protected view corridor on site showing the Wonderful Barn in the distance. (Source: Innovision.)

There are no known protected structures on site, nor is the site located within an architectural conservation area; however, the lands have, to date, produced prehistoric evidence in the form of a polished-stone axe, a flint blade, and a fulacht fiadh (recorded monument KD011-062----), with each recorded as part of the development of the Hewlett Packard Campus.

The topography of the site falls moderately in a northwest to east direction (59.25AOD – 45.00AOD). Two existing surface water retention ponds are located on the eastern site boundary. An additional fire water retention pond is also located there. Additional bunded storage is provided in the surrounding landscaped area in the event of an overflow occurring. The normal capacity of the retention ponds is 5000m3, with an additional 25,000m3 being able to be accommodated in the bunded overflow area. The discharge to the outfall is controlled to ensure an appropriate volume of water is retained at all times. These ponds serve the existing site as attenuation during extreme storm events as well as to provide the firefighting network with water when required. The site ultimately discharges its surface water runoff directly via an outfall drain to the Leixlip Reservoir, following confirmation of water quality through electronic monitoring mechanisms inclusive of shut off valves, upstream of the existing Retention Ponds near the existing site entrance off the Celbridge Road (Refer to CSEA Drawing No. DR-C-2100).

The site has an existing 110 kV substation (Rinawade Substation), which provides electricity to the campus via connecting overhead lines traversing the site in a north-to-south direction. The transmission lines connect to both the Dunfirth/Kinnegad 110kV substation and Maynooth 220kV substation.

The proposed works site also includes two portions of land in the ownership of KCC[2], the first being a section of existing road on the R404, which will be developed with new replacement signalised intersection, and the second being the lands along the M4 and to the north of the M4 which will provide a landing site for a new pedestrian and cycle overpass.

[2] A letter of consent from KCC for the application to be made has been submitted with the application

The lands to the north are part of the Wonderful Barn domain (in the ownership of KCC) and currently include the Wonderful Barn allotments and an existing Haul Road which is currently being used to complete the development of a residential estate known as Barnhall Meadows.

2.4.2 Facilitation Works Site

GNI Gas Upgrades

The KIC Masterplan will be supported through enhancement of the existing distribution network connection and the upgrade of the existing gas skid on site to power the proposed energy centre.

The proposed upgrade of the existing gas skid is included in the application for development consent and is identified on the relevant drawings submitted with the application. The proposed enhancement works are to be carried out by GNI and will subject to a separate consent process.

The GNI upgrades will be delivered through a local upgrade of the gas network over a length of approximately 1.5km through predominantly residential areas. The route of the upgrades will be along Ryevale Lawns along Station Road, Old Hill and Celbridge Road for a distance of approximately 1.5km up to the entrance of Barnhall Meadows (Figure 2.4). The pipe will run under the existing road pavement. At the entrance to Barnhall Meadows, the pipe will run underground through the Barnhall Meadows lands (adjacent to the existing haul road) and will then cross the M4 Motorway through Horizontal Directional Drilling and enter the Kildare Innovation Campus then connecting to the proposed Gas Skid.

For the proposed GNI upgrade route, c. 1.18 km of the route will be installed within public roads under existing blacktop, with c. 0.14m of the route installed within the lands north of the M4 comprising a haul road. From the lands north of the M4, the route will cross beneath the M4 south into the campus via Horizontal Directional Drilling (HDD) process (c. 0.18km), connecting to a new gas skid installed at the existing gas skid location. The existing gas skid will be decommissioned and removed. The proposed HDD process will avoid tree removal, with all works to occur outside Root Protection Areas (RPA). The proposed HDD route will be below the RPA of any trees within the north lands and within the campus (minimum 1m depth). The launch pit for the HDD will be adjacent to the haul road which currently comprises a brownfield site. The exit pit will be directly adjacent to the temporary site compound within the campus.

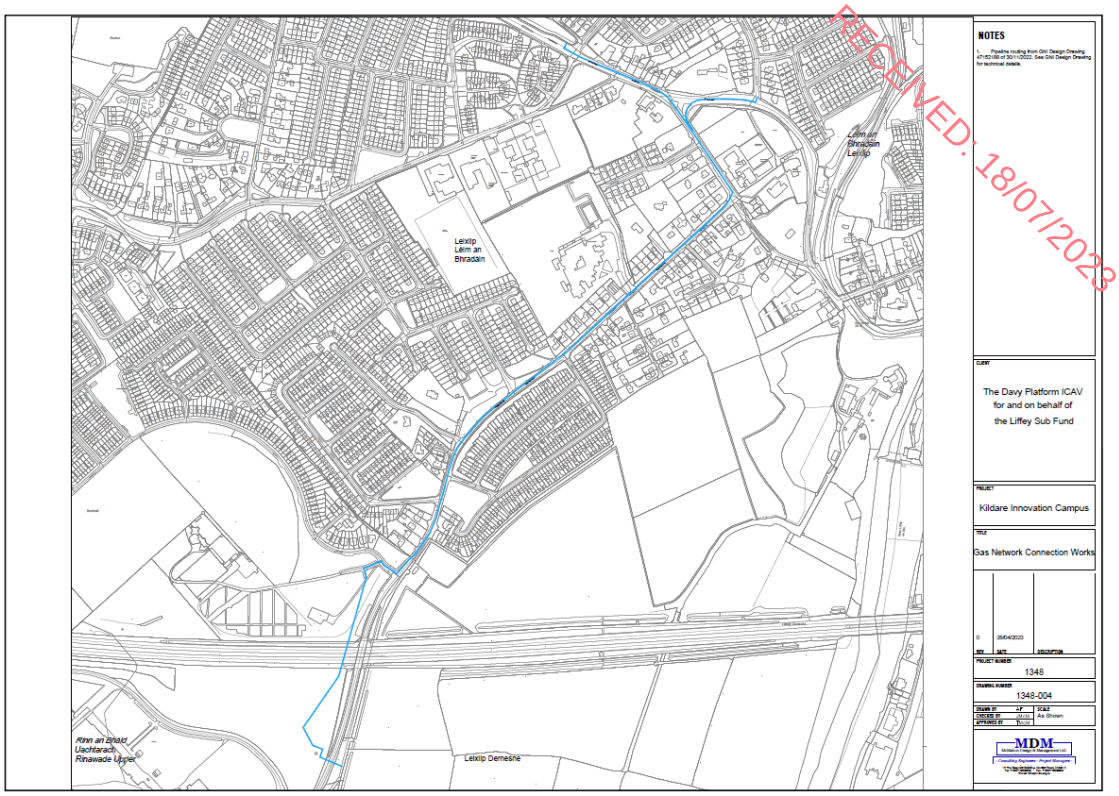


Figure 2.9: Indicative Route for Upgraded Gas Connection. Source: MDM Engineering Drawing No. 1348-004 (Refer to Appendix 2.1).

EirGrid Uprating

Upon completion of Phase 1 of the KIC Masterplan, including the development of the proposed replacement 110kV Substation, uprating of existing overhead lines from the replacement 110kV Rinawade substation to Derryiron/Maynooth and Dunfirth/Kinnegad will be required to facilitate commencement of Phase 3 of the KIC Masterplan.

The proposed replacement substation is included in the application for development consent and is identified on the relevant drawings submitted with the application. The proposed uprating works will be carried out by Eirgrid and will subject to a separate consent process.

The Eirgrid uprating will be delivered through two separate overhead line (OHL) uprates a local upgrade. This uprating would occur in four stages identified in Table 2.1 above.

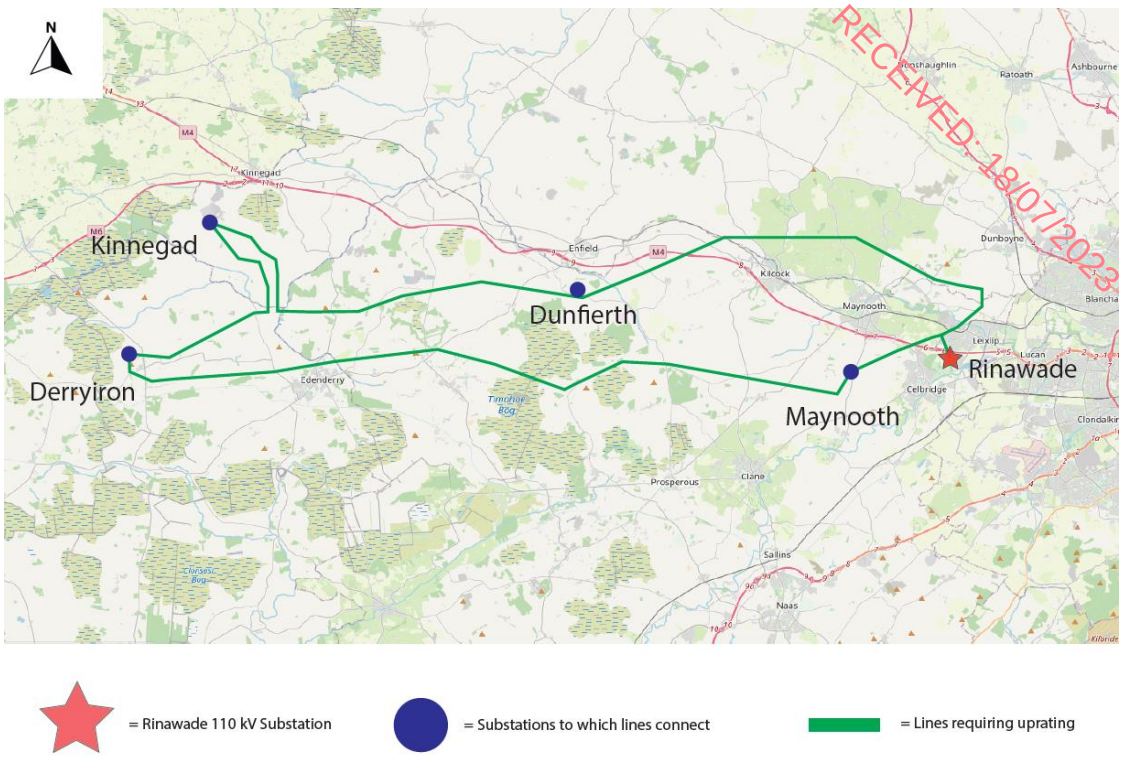


Figure 2.10 - Map of Existing 110KV routes requiring upgrade to facilitate the KIC development.

Stage 1 – Maynooth to Rinawade

In terms of the stage 1 upgrades the works would occur along the existing line beginning at the Rinawade substation to the west of the existing Liffey Business Park heading north across the M4 and traversing suburban residential areas in Kilmacredock and Easton Meadows. The route of the existing line then moves west across the R449 and veers south westerly towards the Maynooth substation, again traversing the M4 and the R405 south of this. Lands are largely agricultural with various other uses along the route including Celbridge Community School, light industrial and commercial buildings at the M4 Business Park and Corbally stud. The Myplan.ie mapping service indicates 2 National Monuments located approximately midway between Corbally Stud and the M4 Business Park, as well as a cluster just north of the M4 along the route. The route does not appear to traverse any designated European Sites or Flood Zones.

Stage 2 – Kinnegad to Rinawade

Upgrade works would again occur along this existing route beginning at the Rinawade substation adjacent to the KIC. The route carries in a north easterly direction, crossing the main Dublin – Sligo rail line and traversing the Collinstown Industrial Estate (Intel Campus) on the western outskirts of Leixlip. Just north of the Collinstown Estate the line traverses the Rye Water Valley/ Carton Special Area of Conservation (SAC) after which it moves into largely agricultural lands and crosses into Co. Meath. The route then moves in a west north westerly direction and passes along the south of the R&R Golf Course and the village of Kilcloon for a distance of approx. 7km. The route of the existing line then shifts due west for a further 7km where it re-directs in a south westerly direction and traverses the Royal Canal. The line

continues for a 9km stretch crossing the R148, M4 and local roads before connecting into Dunfierth 110Kv substation.

Stage 4 – Derryiron to Maynooth

This 43 km phase of upgrade works will occur in a corridor stretching in a largely east – west direction between the Derryiron power station and Maynooth substation. Notable features along the route include the Timahoe Bog, a cluster of National Monuments at Carbury Hill near Edenderry, the town of Edenderry, Co. Offaly, the village of Rhode. A section of the line between Edenderry and Rhode carries parallel to the north of the Grand Canal.

Stage 5 – Derryiron to Kinnegad

Includes for uprating of existing lines along a 15km stretch incorporating predominantly agricultural lands and crossing between Co's Offaly and Meath, terminating at the Kinnegad substation located within the Breedon Cement Works compound.

2.5 Description of the Physical & Operational Characteristics comprising the Project

2.5.1 The works subject to this Development Consent (the principal works)

The proposed development (the principal works) is for the expansion of the existing Kildare Innovation Campus (KIC) and is described in the statutory notices as follows:

- Demolition of existing Buildings No's 7, 8 and 9 (total gfa c. 84,838sqm).
- Existing Buildings No's 1 – 6 will be retained for deep tech and innovation related uses (total gfa c. 42,862sqm)
- Construction of 2 no. new deep tech buildings and 4 no. new data centre buildings, all including ancillary office spaces. The deep tech buildings will have an overall maximum height of c.16m and vary in size from 30,945sqm – 41,190sqm with a combined total gfa of c. 72,135 sqm. The data centres will be c.15 m in height to parapet and c.16.5m in height to top of roof plant screening. The data centres will vary in size from 13,225 sqm – 21,000 sqm with a combined total gfa of c. 76,225sqm. All buildings will be provided with Solar PV panels at roof level and green walls along selected elevations.
- The new deep tech buildings (A1 & A2) will be provided with service yard areas, loading docks, car parking, access roads, security fencing/gates and landscaping. The deep tech buildings will include rainwater harvesting tanks and green roofs over office areas.
- Each data centre (B1, C1, C2 & C3) will include data halls, admin blocks (comprising offices, breakroom, loading dock, storage, and ancillary areas) and a variety of mechanical and electrical plant areas/structures including battery storage rooms and mechanical rooms. Car parking, access roads, security fencing/gates, gate houses and landscaping will also be provided.
- B1 will include 14 no. fuel oil generators, MV rooms and associated mechanical flues. C1 – C3 will each include 22 no. fuel oil generators, MV rooms and associated mechanical flues (each c.18.6m high). Car parking, access roads, security fencing/gates, gate houses and landscaping will also be provided.
- 2 no. district heating pump house areas and inground piping for district heating system.
- Construction of a Replacement 110kV Gas Insulated Switchgear (GIS) Substation adjacent to the existing 110kV Rinawade Substation. The current Air Insulated Switchgear (AIS) substation known as the Rinawade 110kV sub is fed by 2 x 110kV Overhead lines. The new

substation will connect to these overhead lines via short runs of underground cable. The replacement 110kV substation will include 6 No. transformers, with client control building and a 2 storey GIS substation building within a 2.4m high fenced compound.

- Decommissioning and removal of the existing 110kV Rinawade substation.
- Construction of an on-site energy centre to provide dispatchable power to the national electrical grid. The Energy Centre will include 9 no. gas powered combustion turbine generators (CTG's) and 9no. flues with a maximum height of c.15 metres. The turbines will be enclosed by a screen wall c.14m in height. The energy compound will include all required infrastructure including 2no. back-up fuel oil (HVO) tanks, an administration building, pump house, fire water tank, access roads, 14no. parking bays, security fencing etc.
- Provision of a Gas Networks Ireland (GNI) gas skid surrounded by a 2.4m high fence and access from Celbridge Road (R404). The GNI skid will replace the existing gas skid along Celbridge Road.
- Provision of a GNI AGI (Above Ground Installation) including 1no. kiosk building, c3.2m high, surrounded by a 2.4m high fence.
- Closure of the existing main entrance to the campus on Celbridge Road and reinstatement of the boundary.
- Construction of a new signalised entrance/exit on Celbridge Road c. 80metres north of the existing main entrance.
- Use of the existing secondary entrance/exit off Barnhall Road Roundabout in the south-east as a principal entry/exit.
- Construction of internal access roads, footpaths and cycle paths including a publicly accessible link road between Celbridge Road (R404) to the east and Barnhall Road (R449) to the west.
- Construction of a new pedestrian and cycle overpass across the M4 motorway and pedestrian/cycle path adjacent to lands known as the Wonderful Barn Allotments; the overpass will link the new publicly accessible link road within Kildare Innovation Campus to the entrance of Barnhall Meadows estate.
- Undergrounding and diversion of the existing overhead 10 Kv/20kv overhead line adjacent to the M4 motorway.
- The pedestrian and cycle route within the Kildare Innovation Campus will provide a link from the new public link road, along the protected view corridor (between Castletown Estate & Wonderful Barn) to the north-eastern boundary of Castletown Estate.
- The provision of a net increase of 678 new car spaces, resulting in a total of 2291 car spaces across the site (including a total of 244 EV car spaces).
- The provision of a new private EV Bus charging hub with parking for 10no. electric buses.
- The provision of a net increase of 310 new bicycle spaces, resulting in a total of 350 bicycle spaces across the site.
- The diversion of the c. 500 m stretch of an existing 1.5 m culvert, located to the north of the site along the existing loop road, southwest by c. 60 m; the diverted culvert will be located along the proposed link road.
- All associated site development works, drainage and services provision, landscaping, boundary treatments (including security fencing), and associated works.

2.5.2 Data Centres

A data centre is a centralised computer server system designed to provide information storage, management and distribution functions to individuals' businesses and organisations. With ever increasing levels of online activity and ever larger volumes of data, the global

demand for data storage is increasing rapidly. The proposed facility will enable the data centre tenant to meet this demand.

The proposed data centre development will allow the data centre tenant store their information at a secure and reliable facility. Data Centres are typically constructed on a relatively large scale compared to other forms of industry which results in significant benefits in terms of economies of scale.

The Primary advantages are:

- much higher reliability with built in redundancy systems;
- 24/7 monitoring of the facility and its systems by staff;
- Higher security and data protection;
- Flexibility – ability to increase or decrease storage requirements at short notice in line with specific business needs;
- lower network latency and higher bandwidth at lower cost;
- Specialist network and facilities engineers typically not viably employed by individuals, businesses or organisations.

Ireland's climatic conditions are well suited to data centre operation because data centres are conditioned primarily utilising outside air, via roof mounted air handling units. Conditions in Ireland are conducive to this free cooling strategy, which essentially moves outside air across the servers to cool and then exhaust the higher temperature air to atmosphere. This reduces the need for less sustainable forms of cooling often required in warmer climate countries. There are other small areas in the Data Centre buildings which require additional cooling, but the majority of the buildings are serviced by outside air cooling.

During the warmest periods of the year (at temperatures exceeding 24 degrees Celsius) evaporative cooling systems (integrated into the Air Handling Units) have been incorporated into the design. These systems will be required very infrequently and when used will use primarily recycled rainwater.

Data Centre Building B1 will require a total of 32MW power once fully developed and fully utilised, Data Centre Buildings C1, C2 and C3 will require a combined total of 138MW once fully developed and fully utilised. Each Data Centre building is supported by a dedicated electrical plant room, which provides the necessary power to ensure the Data Centre Building operate optimally at all times.

The associated demands on energy, water and other natural resources are discussed in greater detail under section 2.5.9 below.

The gfa of B1 is c.12,925 sqm and C1 – C3 each have a gfa of 19,000sqm. The building's will be single storey and have an overall height of 13.6m. The internal area of the building includes a series of rooms as required by the end user. An admin area will be provided within each building.

The buildings will be finished with a mix of insulated metal cladding (mixed tones) and living/green walls. The office component will be fully integrated in terms or circulation and design and will be finished with a glazed curtain wall and external feature metal sunshades. The office will include an open plan office as well as a reception area, kitchenette/break room and changing room/showers.

Car Parking areas will be provided adjacent to B1, C1, C2 and C3 and provide a total of 200 car spaces. Vehicle access will be provided via a gated access from the internal campus road. An emergency fire tender access will be provided via the link road for Building B1 and via the campus road for Building C1, C2 and C3.

Each data centre will include a data hall, admin building with loading dock area and generator yard consisting of a total of 80 no. generators across the 4no. data centres. Fuel oil for the generators will be stored within the respective belly tanks of each generator. In the event that there is a loss of utility power to the site through the 110kV Substation, back-up generators are provided for the data centre buildings (B1, C1, C2 & C3) to maintain power at critical loads. The generators are designed to automatically activate and provide power pending restoration of the primary power supply to the site. It should be noted that that the proposed Energy Centre (Refer Section 2.5.5), due to specific power ramping profile requirements, is not designed to provide power direct to the data centres on site. Rather the energy centre provides dispatchable power directly to the national grid as required by the grid operator. An uninterruptible power source or UPS system with battery energy storage is also provided with the data centre compounds for the short-term transition from mains power to generator power.

The data centre operator, similar to the energy centre, is committed to using Hydrotreated Vegetable Oil (HVO) (where available) as the back -up fuel supply for the generators. As such, significant environmental benefits will be achieved through the use of HVO as referenced above.

Building B1 will have 14 critical back-up generators, Buildings C1, C2 and C3 will each have 22 critical back-up generators. Bulk HVO where available will be stored for use in double-skinned belly tanks associated with each of the generators. Each tank has the capacity to store 15.5 m*3* of diesel; therefore, a total of 1,240 m*3* across all Data Centres (or 1066 tonnes at a density of 0.86 tonnes / m*3*). Whilst the data centre operator is committed to utilising HVO the generator supplier has advised that the standard generator emissions data sheets have not been updated to reflect the use of HVO over standard diesel, as such the EIAR has modelled Air Quality using standard diesel (Refer to Chapter 9 – Air and Chapter 10 – Climate).

The data centre operator estimates based on experience that the standby generators will be rarely used. They will be tested periodically to maintain operational readiness. The assessment of these emissions is presented in Chapter's 9 (Air) and 10 (Climate).

As part of Phase 1 of the development building B1 will only utilise c.16MW of electricity from the new replacement 110kV Substation. It is noted that this power supply will take a number of years to ramp up. In Phase 3 of the development the B1 data centre will ramp up to 32MW usage overtime. Data Centres C1, C2 and C3 will be developed out in Phase 3 of the project and will bring the overall power demand of all the data centres to 170MW once fully developed and utilised.

Once commissioning is complete, each data centre will "go live", following the phasing outlined in section 2.6, and serve data customers on an ongoing basis. The server systems and the supporting infrastructure will be monitored by site staff and faults identified and remedied, as required.

Staff will primarily be required onsite for security, ongoing monitoring, and maintenance of plant and equipment. Once operational, approximately 445 No. full time employees will be

present on site daily, in total, for all data centre buildings, including external staff, maintenance contractors and visitors, as required. The number of external staff, maintenance contractors and visitors will typically be approximately 135 No. staff per day. Staff will present on a shift basis, so numbers will vary throughout the day with up to approximately 63 No. staff on night shifts each day. It is anticipated the operational phase of the data centre development will generate a range of non-hazardous wastes. An Operational Waste Management Plan (OWMP) will be developed prior to commencement. The plan will seek to ensure the facility contributes to the targets outlined in the EMR Waste Management Plan 2015 – 2021. Refer to Chapter 12 (Waste) for further detail.

During times of activity, there is the potential for noise to be generated from equipment associated with the data centre buildings as outlined in Chapter 11 (Noise & Vibration). This has been anticipated and has been mitigated within the design of the Masterplan by locating noise generating equipment away from sensitive interfaces, furthermore acoustic louvres' have been incorporated into façade design and acoustic screens provided at rooftop locations. Refer to Chapter 11 for further detail. Predicted Air emissions from the data centres have been assessed in Chapter 9 (Air) and Chapter 10 (Climate).

Refer to RKD Architectural Drawings *KIC-RKD-B1-00-DR-A-1100 to KIC-RKD-B1-ZZ-DR-A-1300, KIC-RKD-C1-00-DR-A-1100 to KIC-RKD-C1-ZZ-DR-A-1300, KIC-RKD-C2-00-DR-A-1100 to KIC-RKD-C2-ZZ-DR-A-1300 and KIC-RKD-C3-00-DR-A-1100 to KIC-RKD-C3-ZZ-DR-A-1300* for further detail.

2.5.3 Deep Tech Buildings

The ultimate tenant for the proposed Deep Tech buildings is not yet agreed. Buildings A1 and A2 have been designed to be flexible to accommodate a range of potential end user requirements.

Deep Tech companies are generally understood to be founded on a scientific discovery or meaningful engineering innovation. A deep tech business typically starts with and focuses on real innovative technology. It's deployed to solve almost intractable problems in the real-world. Deep tech startups are likely to be based on artificial intelligence or machine learning, or other innovative applications to new or existing emerging technologies. Examples include block-chain, computer imaging, and Virtual Reality. Examples of deep tech might include Artificial Intelligence applied to predict natural disasters or molecular imaging technologies that identify disease or predisposition to disease far before any other existing test possible could.

The European Institute of Innovation and Technology (EIT)[3], a body created by the EU in 2008 to strengthen Europe's ability to innovate, describe deep technology or deep tech as '*a classification of an institution, an organisation or a start-up company, with the expressed objective of providing advanced and emerging technology solutions to deep societal challenges. They present scientific or engineering challenges requiring lengthy research and development, and large capital investment before successful commercialization.'*

The EIT identifies a list of deep tech fields include:

[3] https://www.eitdeeptechtalent.eu/

- advanced materials and manufacturing;
- aerospace, including drones;
- artificial intelligence and machine learning;
- biotechnology;
- blockchain;
- Web 3.0;
- electronics;
- photonics;
- quantum computing;
- robotics;
- semiconductors (microchips);
- sustainable green energy and clean technologies.

Whilst the KIC campus will focus towards deep tech (high-tech innovation in engineering and significant scientific advances), ultimate end users may specialise in health, agriculture, medicine, and pharmaceutical and food science industries. The proposed new Deep Tech building designs include large manufacturing floor spaces which will be flexible for end users needs. Integrated office spaces area also provided. The deep tech buildings are not expected to have water or energy demands beyond a typical manufacturing and office space. The associated demands on energy, water and other natural resources are discussed in greater detail under section 2.5.9 below.

The design of the Deep Tech buildings incorporates a range of spaces to provide the facilities to expand various activities. Staff numbers for deep tech buildings will include employees involved in *inter alia* research and development as well as staff for security, ongoing monitoring and maintenance of plant and equipment. The total number of staff to be generated from deep tech is estimated to be approximately 1,875 No. employees. Waste is expected to be minimal and will be managed by an Operational Waste Management Plan to be prepared and submitted by the final operator. Noise and Vibration is not expected to be significant with modern deeptech not requiring the same level of cooling equipment as might be required by Pharma or traditional manufacturing. Refer to Chapters 9 (Air), 10 (Climate) and 11 (Noise) for further detail.

The EIAR has assessed the likely end use using assumptions based on typical R&D uses. Should a future end user seek to utilise the proposed spaces with different requirements then the environmental impacts will need to be identified and assessed at that time.

Building A1 is a Deep Tech development with a gfa of c.30,510 sqm and Building A2 is a Deep Tech development with a gfa of c.40,540 sqm. Both buildings will be two storeys (with three storey office) and have an overall height of 16m. Loading/unloading for each building will be via a series of loading docks along the rear of the building. The loading docks will provide access to the adjacent service yard. The internal area of the building is typical of a deep tech (manufacturing/office) layout and includes access to an office space.

The buildings will be finished with a mix of insulated metal cladding (mixed tones) and living/green walls. The office component will be fully integrated in terms or circulation and design and will be finished with a glazed curtain wall and external feature metal sunshades. The office will include an open plan office as well as a reception area, kitchenette/break room and changing room/showers.

Car Parking areas will be provided adjacent to A1 and A2 and provide a total of 1,183 car spaces. Vehicle access will be provided via the link road for building A1 and the internal campus road for building A2. A separate service access will also be provided for each building. 86 no. Bicycle Spaces will be provided for both buildings.

Refer to RKD Architectural Drawings *KIC-RKD-A1-00-DR-A-1100 to KIC-RKD-A1-ZZ-DR-A-1300 and KIC-RKD-A2-00-DR-A-1100 to KIC-RKD-A2-ZZ-DR-A-1300* for further detail.

2.5.4 110kV Substation

The development will be fully powered by connection to the national grid. Through engagement with Eirgrid on the first phase of the masterplan (16MW) a connection agreement has been reached[3], this agreement includes the provision of a new 110kV substation to replace the existing substation which is nearing end of life. The connection agreement for the first phase of development will utilise power already allocated to the site through the existing 110kV Rinawade Substation. In line with *EirGrid's Data Centre Connection Offer Process and Policy* further connection agreements with EirGrid for the full development can only be reached once planning consent is in place.

The proposed 110kV Replacement GIS substation is located directly to the east of the existing 110kV Rinawade AIS substation on site. The current Air Insulated Switchgear (AIS) substation known as the Rinawade 110kV sub is fed by 2 x 110kV overhead lines. The new substation will connect to these overhead lines via short runs of underground cable.

The replacement 110kV substation will include 6 No. transformers, with client control building and a 2 storey GIS substation building lighting masts, carparking and access roads within a 2.4m high fenced compound.

The two storey GIS substation building will accommodate a cable room, control room, mess room, generator room, battery room and workshop at ground floor level, with a storeroom and substation room at first floor level. The single storey Client Control Building will accommodate 4 number electrical switch rooms and a control room. Both buildings are rectilinear in form and finished in metal cladding

The proposed 110kV replacement substation will be accessed via the proposed campus roads. A main access gateway into the substation compound will be provided on the eastern side of the substation compound.

The 110 kV substation, once commissioned, will operate 24/7, 365 days per year and will provide c. 16 MW of electricity to the existing campus, in Phase 1. Phase 2 of the campus will be powered by the same connection from Adamstown that provides power to DB Schenker. To accommodate Phase 3, uprating/line replacements of the existing overhead lines into the site will be required to accommodate the complete build out of the KIC Masterplan. The works will allow the substation to provide 170 MW of electricity to the Campus.

The existing Rinawade substation will be decommissioned and removed, and lands reinstated following the complete build out of the KIC proposal.

Refer to RKD Architectural Drawings *KIC-RKD-RIN-ZZ-DR-A-1100 to KIC-RKD-RIN-ZZ-DR-A-1201* for further detail.

2.5.5 Energy Centre

The proposed development will include its own energy centre to be built out over the life of the permission and will provide for 100% dispatchable power. The provision of dispatchable power generation is a requirement of the *CRU [CRU21124-CRU-Direction-to-the-System-Operators-related-to-Data-Centre-grid-connection-.pdf (divio-media.com)]*, which requires a data centre applicant to bring onsite dispatchable generation (and/or storage) equivalent to or greater than their demand. The proposed development will not be connected to the energy centre nor will it rely on it for power.

The energy centre will be located to the centre of the campus and to the rear of the existing Building Nos 2, 3, 4 & 5. It will be accessed via an internal campus road which also provides access to the service yards of the existing buildings on site. The energy centre will include a two-storey services building, loop access road, electrical infrastructure, fire water tank, fuel oil and ammonia pump house, ammonia storage, 2no. fuel oil[4] storage tanks with a volume of c.3440 tonnes and height of c.14m from ground level and carparking for staff and services. The energy centre will be surrounded by a c.3m high security fence with security gates. Within the compound there will also be 9no. combustion turbine generator's (CTG's). Each CTG will have associated infrastructure including stacks to a height of c.15m. The CTG's will be enclosed by a c.14m high architecturally treated acoustic enclosure. Refer to RKD Architectural Drawings *KIC-RKD-ZZ-ZZ-DR-A-1055, KIC-RKD-EC-ZZ-DR-A-1100 to KIC-RKD-EC-ZZ-DR-A-1401* for further detail.

The energy centre will be supplied by GNI's enhancement of the existing supply to the site to support the proposal (identified above under 'Facilitation Works'). The Energy Centre will include 9no. CTG's to ensure equal power can be replaced within the grid to alleviate any potential constraints of the data centre usage. Further to this, the CTG's will also provide reinforcement to grid if and when required.

The initial phase of the energy centre will include one CTG, a natural gas fuel supply system, a Hydrotreated Vegetable Oil (HVO) fuel storage and supply system (c.3440 tonnes), a fire protection system, low and medium voltage electrical systems with transformers, a service building and warehouse, and other miscellaneous equipment. The final phase of the energy centre will include an additional eight CTG's with selective catalytic reduction (SCRs) and supporting equipment.

The CTGs will be primarily fuelled by natural gas/bio-gas supplied by Gas Networks Ireland (GNI) via their existing high-pressure network that runs close to the site (subject to upgrade). It is envisaged that the energy centre will aim to use as much renewable gas as is commercially available in the market and through negotiated contracts. This will be provided via Corporate Power Purchase agreements for renewable energy projects will include bio-gas and/or hydrogen as well as other available renewables which the applicant intends to enter into

[4]HVO

before the proposed development first becomes operational[5]. The facility will also include a 5-day supply of HVO as a backup fuel should the natural gas system be unavailable in an emergency situation. With equipment modification, the CTGs are capable of operating on at least a mix of hydrogen should this be available in the future.

HVO is a low-carbon biofuel that operates as a direct replacement for conventional diesel. It is made from renewable, sustainable raw materials which do not release any new CO2 into the atmosphere. HVO is made from 100% renewable plant-waste matter and meets bio content requirements with no FAME (Fatty Acid Methyl Ester) included. This ensures that it avoids the instability and operability issues seen by many low blend diesel fuels and high blend biofuels. Unlike conventional biodiesel, hydrogen is used as a catalyst instead of methanol, which makes HVO cleaner burning and ensures a longer shelf life.

The HVO to be used as back-fuel source for the energy compound will be produced and accredited to meet the international fuel standard BS EN 15940, the specification for paraffinic diesel, and the Fuel Quality Directive 2009/30/EC Annex II. The CTG Turbine supplier has advised that the standard generator emissions data sheets have not been updated to reflect the use of HVO over standard diesel, as such the EIAR has modelled Air Quality using standard diesel (Refer to Chapter 9 – Air and Chapter 10 – Climate). Notwithstanding this, HVO is considered to have substantially lower emissions[6] than traditional fossil fuels. It is noted that burning renewable diesel results in CO2 emissions, however emissions from renewable diesels are significantly less than fossil fuel as growing the biomass feedstocks for production of renewable diesel may offset the CO2 produced in the burning of HVO. For comparison, fossil fuel derived diesel has a total lifecycle emissions of c. 94 gCO2e/MJ while renewable diesel using waste cooking oil as feedstock can be as low as 5.6 gCO2e/MJ.

The CTGs and certain auxiliary equipment will be housed in purpose-built enclosures to reduce noise to acceptable near-field levels for personnel safety and to assist in meeting far-field noise levels. Furthermore, the entire power block of CTGs will be surrounded by a 14m high acoustic barrier. Refer to Chapter 11 – Noise & Vibration for further detail.

It is noted that the Energy Centre is not proposed as the primary power supply for the proposed development. It will not be connected to the proposed data centres or deeptech buildings. The energy centre will operate as dispatchable power in line with CRU and EirGrid requirements. In this regard it is noted that EirGrid's Policy Data Centre Offer Policy Information Note (eirgridgroup.com) states *"EirGrid will provide firm capacity where a data centre provides new on-site dispatchable generation that meets the annual availability requirements…… and is capable of continuous running for extended periods, e.g. its running is not limited by fuel reserves, environmental licencing or regulatory obligations."* The Eirgrid outline includes an example which requires the dispatchable generation to be available 330 days per year. In summary, the worst-case scenario would be that the energy centre operates for 330 days per year, however, based on experience of the operation of similar demand management projects where EirGrid have requested large energy users to curtail demand during crunch periods, particular during winter, it is expected that energy centre will operate significantly less than 333 days per year/ 24-hours per day and more likely to be no more than c.1,500 hours per year. Notwithstanding this, to meet the relevant EirGrid requirements, the energy centre cannot be limited in terms of its operation and as such using the precautionary

[5] Refer to Response to Principles for Sustainable Data Centre Development Report by TPA + Others
[6] https://www.eia.gov/energyexplained/biofuels/biofuels-and-the-environment.php

principle, the worst-case scenario has been assessed in this EIAR where the energy centre is required to operate 333 days per year.

Stormwater will be directed to the stormwater system. Stormwater which is contained in bunded areas, such as around the fuel oil tanks, fuel oil unloading areas, and the transformers, will be inspected through the use of electronic monitoring systems prior to discharge. Any stormwater with potential amounts of oil will first pass through an oil/water separator prior to discharge. Sanitary wastewater will be discharged to the foul sewer.

The facility will have fire detection and fire suppression systems installed to meet current NFPA and Irish and EU codes. The fire water system will include a fire water storage tank with a 2-hour storage volume (757 m3), an electric main fire pump, a diesel engine backup fire pump, a foam system and other required hydrants and hose stations. An aerosol-based fire suppression system will be provided for the CTGs.

The energy centre is entirely air-cooled. The CTG will employ air-cooling for the generator, the lube oil, and the enclosures. The Energy Centre will require 5 No. full-time employees to operate. Regarding emissions, the Energy Centre, during times of activity there is the potential to generate emissions as outline in Chapters 9 (Air) and 10 (Climate). During times of activity, there is the potential for noise to be generated from equipment associated with the energy centre as outlined in Chapter 11 (Noise & Vibration). This has been anticipated and has been mitigated within the design of the Masterplan by locating the energy centre to the centre of the site and away from sensitive interfaces, furthermore an acoustic wall is proposed around the perimeter of the energy center providing a suitable noise buffer for when the energy center is required to operate. Furthermore, acoustic treatment at source has been factored into the design to ensure noise emissions from the proposed plant are in accordance with required standards. Refer to Chapter 11 for further detail.

It is noted that the current power supply to the campus via the existing 110kV Substation is not supplemented with dispatchable power. This will change as a result of the proposed KIC development, as the replacement 110kV Substation will be provided with equal dispatchable power, meaning that the proposal will provide a net improvement to grid reinforcement for the benefit of all users.

It is noted that the Energy Efficiency Directive requires EU countries to ensure a cost-benefit assessment is undertaken on the potential of using co-generation when it is proposed to build an industrial installation generating waste heat with a total thermal input exceeding 20MW. When in use the proposed energy centre would exceed this threshold, however given the facility is proposed only to operate as a dispatchable power plant and only to operate during very high levels of demand and is expected to operate less than 1500 hours per year over a five-year period then the proposed energy centre is exempt from cogeneration cost benefit analysis. Should the energy centre be required to operate in excess of 1500 hours per year over a five-year period then a cogeneration cost benefit analysis will need to be undertaken. Further to this, it is noted that the quantum and availability of recycled heat generated from the energy centre would be unstable given the unknown nature of when Eirgrid would require dispatchable power to be provided to the grid. As such, the overall campus design has implemented a much more stable waste heat proposal as discussed below in section 2.7.

2.5.6 M4 Overpass

The proposed M4 Overpass is proposed to be sited perpendicular to and over the M4. The structure will serve as a pedestrian and cycle overbridge crossing the existing M4 motorway and include allowance for any future expansion of the motorway. The structure has been designed as a single span steel arch truss bridge, with a 57m clear span. The structure will have a minimum headroom of 5.7m above the M4 including integration of services within the structure.

There is an overhead gantry structure spanning the westbound carriageway, approximately halfway between the historic viewing corridor (direct line of sight between Castletown House and the Wonderful Barn) and the R404 overbridge. As per TII design standards, *gantries shall not be located less than two times their maximum height clear of any overbridge unless the interaction with wind is considered.* Therefore, an allowance of 39m between the existing gantry and the proposed structure has been provided. It is noted that separate proposals are being developed by TII to widen the M4 carriageways. These proposals have been accounted for in the design of the overpass.

To accommodate the proposed M4 Pedestrian and Cycle Overbridge design diversion of the existing 10 kV/20kV overhead power line, south of Barnhall Meadows will be required. North of Barnhall Meadows, a diversion of the 38Kv and higher overhead powerline is not anticipated, but the hazard zone will need to be accounted for during construction. Refer to Refer to Chapter 13 (Traffic) and '*M4 Pedestrian and Cycle Overbridge Preliminary Design Report*' by CSEA for further detail and CSE drawings *21_048A CSE HGN XX DR C 2000 - 21_048A CSE HGN XX DR C 6404* for further detail.

2.5.7 Pedestrian/Cycle Path

A proposed M4 Overpass will accommodate a new pedestrian and cycle link between the entrance to the Barnhall Meadows Estate and the Kildare Innovation Campus. The pedestrian and cycle path will facilitate connection to the R404 (Celbridge Road) at the entrance of the Barnhall Meadows estate and will run along the existing haul road (to be resurfaced) within KCC lands north of the M4. Upon crossing the M4 the pedestrian and cycle path will connect into the proposed Link Road. At this point cyclists and pedestrians will have the option to travel westwards towards the M4, eastwards towards the relocated signalised intersection or into the campus via a new pedestrian and cycle path along the designated view corridor. Through the designated view corridor the pathway is proposed to be a self-bound gravel in buff colour or similar (or as required by KCC). The pedestrian and cycle path will be brought to the boundary with Castletown Estate providing opportunity for a future link into Castletown Estate. The pedestrian and cycle path will continue along the campus road up to the entry of the campus at Barnhall Roundabout. Refer to CSE drawings *21_048A CSE HGN XX DR C 2000 - 21_048A CSE HGN XX DR C 6404* and the Kildare Innovation Campus, *Landscape Architectural Master Plan Design Report* by AECOM for further detail.

2.5.8 The works required to facilitate the project (facilitation works)

The 'facilitation works' are those known works that are expected to be required to facilitate the proposed development over the life of the permission being sought but are not part of the development for which consent is sought. Indicative timing for these works has been included at this stage, however the works will be progressed by the relevant statutory undertakers when required. These elements of the project have been identified as forming an integral part of the overall project.

This EIAR includes an evaluation of the proposed facilitation works. However, it should be noted that although the likely significant effects of the facilitation works are identified, analysed and evaluated in this EIAR, the planning application to KCC does not encompass a request for development consent in relation to the facilitation works. Where reference is made to both the principal works (proposed development for which consent is being sought) and the facilitation works together in this EIAR, the term 'project' will be used.

This EIAR has assessed the cumulative effects of the facilitation works in compliance with the Environmental Impact Assessment Directive.

The facilitation works are as follows:

GNI Gas Upgrades

The first phase of the KIC Masterplan will be supported through enhancement of the existing distribution network connection and the upgrade of the existing gas skid on site. The proposed enhancement works are to be carried out by GNI and will subject to a separate consent process. The GNI upgrades will be delivered through a local upgrade of the gas network.

The existing GNI gas distribution network in the vicinity of KIC will be upgraded to provide enhanced energy capacity to the KIC site under Phase 1 of the project. The enhancement works will comprise the installation of approximately 1.5km of pipework to connect to the campus as well as network reinforcement works of approximately 150m of pipework. A new gas skid will also be installed at the KIC site and an existing skid decommissioned and removed.

The upgrade works will comprise;

- Connecting to the existing Gas Pipelines at Ryevale Lawns;
- Upgrading the existing gas pipeline between Ryevale Lawns along Station Road, Old Hill and Celbridge Road for approximately 1.5km; and
- Laying a new gas pipeline within the Barnhall Meadows Lands, underneath the M4 and into the Kildare Innovation Campus.

The pipeline installation activities will generally comprise the following;

- The distribution pipework installation activities for the overall route comprise approximately:
    - 140m trenching in fields (adjacent to haul road),
    - 180m pipeline installation by Horizontal Directional Drill (HDD) for crossing of the M4 motorway,
    - 1.18km trenching in roads.

- The network reinforcement pipe installation activities comprise approximately:
    - 150m trenching in roads.

Any consents required for the GNI Gas Upgrades will be sought by GNI and the requisite detailed assessment of the consent application will be undertaken at that time by the Planning Authority. Refer to *MDM Engineering Drawing No. 1348-004* (Appendix 2.1) for further detail.

EirGrid Uprating

Upon completion of Phase 1 of the KIC Masterplan, including the development of the proposed replacement 110kV Substation, uprating of existing overhead lines from the replacement 110kV Rinawade substation to Derryiron/Maynooth and Dunfirth/Kinnegad will be required to facilitate commencement of Phase 3 of the KIC Masterplan.

Uprating of existing transmission lines result in an increased capacity and strengthening electrical resilience in the electricity system. Uprating involves the replacement of the overhead line/conductor with more efficient conductor of the same voltage and usually involves the replacement of support structures as the new conductor may be heavier. Further typical detail of uprating works is available within Eirgrids *'Ecology Guidelines for Electricity Transmission Projects'*[7].

This uprating would occur in four stages identified in Table 2.1 above.

2.5.9 Proposed Site Infrastructure & Secondary Facilities

Surface Water Drainage

The proposed surface water drainage network has been designed in accordance with Greater Dublin Strategic Drainage Study (GDSDS)[8] and Greater Dublin Regional Code of Practice. The proposed surface water network flows in a north westly direction and is attenuated before discharging to the Liffey Stream. The allowable discharge from the site is 144.45 l/s and the total attenuation storage volume provided is 23806 m3 in 2 No. attenuation basins, 2 No. attenuation ponds, 1 No. infiltration basin, 3 No. permeable paving with stone storage and 1 No. StormTechTM systems by Cubic M3 or similar is being proposed. A number of petrol interceptors are provided throughout the network to manage water quality and permeable paving has been provided in car parking areas in order to minimise surface water runoff.

Refer to the submitted *Engineering Services Report Drainage and Water Services Report* by CSEA and CSEA Drawing No's *21_048-CSE-00-XX-DR-C-2111 to 21_048-CSE-00-XX-DR-C-2118* for further detail.

Humidification / Cooling Water Discharge

The Data Centres within the campus are designed to use humidifiers and air conditioning systems to maintain the relative humidity and temperature in the internal building space during high temperature days. However, when weather conditions are acceptable for the internal building, fresh air will be directly supplied to reduce both energy and water consumption.

If the relative humidity in the building drops below the minimum required for the electrical equipment, humidifiers will provide moisture to the makeup air. Potable water will be used to supply the humidifiers and is recycled at least 3 times. Any water remaining within the humidifiers will drain to an attenuation tray and then to the surface water system. The

[7] https://www.eirgridgroup.com/site-files/library/EirGrid/Ecology-Guidelines-for-Electricity-Transmission-Projects.pdf

[8] https://www.sdcc.ie/en/download-it/publications/gdsds-new-development.pdf

humidification process is non-contact and chemical-free, thus the water discharged is free of contamination and organics.

ARUP has conducted an assimilative capacity has been conducted by ARUP and included in Appendix F of the separately circulated CSEA Engineering Services Report. The conclusion from the assimilative capacity report shows the evaporative cooling water discharge from the data centres will not have a discernible impact of the River Liffey for any of the water quality parameters analysed.

When ambient temperature exceeds the allowable internal space temperature, air conditioning systems in the admin area will mechanically reject heat from the space. During this process, condensed water can collect in the air conditioning systems and will drain to the surface network. There are no significant contaminants in the air conditioning condensate, as this is purely condensed moisture. The cooling system process does not use any water and will not produce condensation discharge during normal operation.

Foul Drainage

The proposed foul water drainage network has been designed in accordance with the requirements of Appendix B of the Irish Water Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03). The domestic and industrial foul sewer flows in an easterly direction towards two proposed pumping station which pumps to a discharge manhole adjacent to the existing Irish Water 450mmø foul sewer in the Celbridge road to the east of the site.

Further detail in relation the proposed foul water drainage network is identified in the *Engineering Services Report Drainage and Water Services Report* by CSEA and CSEA Drawing No's Drawing No 21_048-CSE-ZZ-ZZ-DR-C-2200 to Drawing No 21_048-CSE-ZZ-ZZ-DR-C-2218. Furthermore, information in relation to wastewater emissions is presented in Chapter 8 Hydrology & Hydrogeology and Chapter 13 Material Assets of this EIAR.

Water Supply

The proposed Water Supply Network will comprise of a 150mmø which will be connected to the Irish Water supply network in the Celbridge Road. The water main will serve the proposed buildings, water treatment plant, sprinkler tanks, deep tech buildings and proposed substation. A separate fire hydrant main will be provided to serve the fire hydrants which will be feed from the sprinkler tanks. For further detail refer to *Engineering Services Report Drainage and Water Services Report* by CSEA and CSEA drawings *(Drawing No 21_048-CSE-ZZ-ZZ-DR-C-2300 and Drawing's No 21_048-CSE-ZZ-ZZ-DR-C-2310 – 2318).*

Water supply is required for cooling equipment, cleaning, general potable supply for drinking and sanitary facilities. The proposed development will have an average domestic water demand of 1.74 l/s for drinking water, meals preparation etc with a peak demand of 10.9 l/s.

The Deep Tech, Energy Centre and Substation will not have an industrial water demand. To reduce both energy and water use in its data centre facilities, the data centre operator utilises direct evaporative cooling systems, which predominately utilise outside air to cool servers. Thanks to this innovative cooling solution, the proposed data centre buildings are projected to demand as little as 0.75 l/s of water on average for each of the three C buildings and 0.50 l/s for the B building.

The Data Centres will use the water supplied by Irish Water for domestic and evaporative cooling. The design philosophy will be to limit the evaporative cooling process to peak summer months only. The water used during these peak summer months will be supplied by on-site industrial water storage only. The industrial storage will be filled during the winter months (Dec - Jan - Feb). Using historic weather data it is estimated that evaporative cooling utilizing process water will only commence during peak summer temperatures. For all temperatures below the peak summer days, the cooling system will operate on direct air only and thus the process water usage will be zero (0 l/s). To confirm, no water demand is required during the winter period.

Each of the C1, C2 and C3 Data Centres have an annual expected potable water demand of 1643.8m3 with the B Data Centre having an annual expected potable water demand of 1166.1m3. Resulting in an annual water demand of 6097.5m3 in the peak summer months only.

This water will be storage on-site such that no water is required from Irish Water during the peak summer months. In order to facilitate the tanks, the development will be required to fill-up these tanks during the months of December, January and February over a two-week period. This duration is an estimate, the exact duration of filling will be determined by Irish water Operations Team subject to supply constraints. The peak industrial water demand for the proposed data centre element of the development is estimated at 5.05 l/s per the submitted PCE (CDS23003038).

The proposed buildings are designed to harvest a significant portion of the annual cooling water requirements through rainwater harvesting, reducing the water used from the local supply from the first year of operation.

The data storage rooms are supplied with fresh air which is sufficient to cool the space for the majority of the annual running hours. For a small number of hours during the peak cooling season, adiabatic cooling is required. Adiabatic cooling uses rainwater as primarily supply and mains water utility as a back-up at ambient temperature conditions to provide cooling on peak cooling days.

The system does not require chillers/compressors which minimises the use of electrical power to maintain the data storage room environmental conditions. The rainwater harvesting will be utilised from the data centre roof throughout the year for the water to be available during those hottest periods during summer months when adiabatic cooling may be needed.

On site storage will be required for firefighting purposes. The volume of storage required will be 450 m3 for the Data Centre Buildings. The fire water tank will be filled over a 24-hour period at a flow rate of 5 l/s during off-peak periods as required.

A separate fire water tank is required for the Gas Power Generation Plant which will have 757 m3. This fire tank will fill over 8 hours at a flow rate of 28 l/s during off-peak periods as required.

For the other buildings (Deep Technology and Substation) on-site fire hydrants will be required to be served from the public supply. Fire flow rate of 35 l/s will be required as per UK National Guidance document on the provision of water supply for firefighting and Kildare County Council Fire Service Requirements.

The above water demand calculations are set out in Irish Water PCE CDS23003038 and the *Engineering Services Report Drainage and Water Services Report* by CSEA.

Electricity

The power requirements for the data centre element of the proposed KIC Masterplan will be provided from the 110kV replacement substation that will be provided on site. The Deep Tech buildings and general infrastructure power will seek to connect into the existing MV supply from Adamstown which currently services the existing DB Schenker development. Further details on power supply, energy efficiency and sustainability are provided in the *Energy and Sustainability Statement* prepared by Ethos and provided with the planning application material.

The new replacement substation will connect to the existing overhead lines via short runs of underground cable. The replacement 110kV substation will include 6 No. transformers , with client control building and a 2 storey GIS substation building within a 2.4 m high fenced compound. The existing Rinawade substation will be decommissioned and removed.

The existing Maynooth – Rinawade 110kV overhead circuit which enters the site in the north-west corner will be retained and diverted to the new replacement substation. The existing Rinawade-Dunfirth/Kinnegad overhead circuit that enters the site in the north-west corner will be retained and diverted to the new replacement substation. Upon completion of the replacement substation, the existing Rinawade AIS substation will be decommissioned and removed.

The proposed substation will replace the existing Rinawade 110kV substation and will utilise the existing grid connection into the site. On completion of the 110kV replacement substation sufficient power will be available to power the initial Data Centre B1 (16MW). The initial Deep Tech Building A1 will be provide sufficient power through existing site connections that also provide power to the DBS building. The substation will also be sufficient to cater for the entire build out of the data centre elements of the KIC Masterplan. To accommodate the full build out of the KIC Masterplan and its power requirements, uprating/line replacements of the existing overhead lines into the site will be required to accommodate the complete build out of the data centre buildings and their peak operational power demand of 170MW

Telecommunications

An existing fibre optic cable is located on campus. The overall networks will be expanded as part of the proposed development. There is sufficient capacity within the network to facilitate the development.

Fire Water System

A fire water ring main will be installed to facilitate the KIC proposed development. The existing firewater pond will be retained to service the existing buildings 1-6 and buildings 7-9 until they are demolished.

Security and Lighting

Traffic accessing the campus will enter the campus from three potential entries. The main traffic is expected to access the campus from the M4 and Barnhall Rd via the existing campus entry. This security control at this entry will be removed and the campus road will be transferred to KCC as a public road. The existing main campus entry along Celbridge Road will be closed and relocated further north, with a new signalised intersection provided on Celbridge Road. The existing signalised intersection on Celbridge Road will be removed and road reinstated as per KCC requirements. The new entrance and road, described as the link road, will be a public entrance and public road, all taken in charge by KCC.

A third entry to the campus will be provided through the existing access of Barnhall Roundabout. This access is existing and currently provides vehicle access to DB Schenker. This access will be security controlled, and access and road will remain in the ownership of the landowner.

Internal to the campus there are a number of security barriers to restrict public traffic to solely the Link Road. Individual access points to carparks and lands associated with each of the proposed buildings (A1, A2, B1, C1, C2 & C3) and existing buildings to be retained (Building No's. 1 – 6) will be controlled by either remote controlled boom gates or sally port entries for the proposed data centre buildings. An emergency fire tender access is also provided to Building B1 from the public link road. Access to the proposed 110kV Substation, Energy Centre and AGI facility will be highly restricted with access provided to required personnel only. Access to the upgraded Gas Skid will be from Celbridge Road and will be for maintenance works only.

Access to the campus will be controlled by campus security. Access to each individual site within the campus will be controlled by the building users. A record will be maintained of all personnel visiting the campus (including deliveries etc.). All visitors to the individual sites within the campus will be required to report to be monitored and supervised at all times.

A 2m high security fence will be constructed around the proposed data centre buildings. Similarly 2.4 - 3m high security fences will be constructed around the perimeter of the 110kv Substation, the Energy Compound, the AGI and Gas Skid. The perimeter of the proposed A1 & A2 buildings will not include security fencing, nor will the perimeter of the existing buildings to be retained. The boundary treatment of these perimeters will include a mix of landscape berms and planting. Further berms and planting will be provided in proximity to the aforementioned security fences to reduce the potential visual impact.

Pedestrian and cycle access to site will be possible via the three above referenced vehicle access points (2x Link Road entrances & Barnhall Roundabout entrance). Pedestrian and cycle access to the campus will also be possible via the M4 overpass which integrates with the proposed Link Road. Pedestrian and cycle access will be allowed through the centre spine of the campus along the designated view corridor. The proposed development will provide and access point up to the boundary with Castletown Estate enabling a future connection through the Castletown grounds. The pedestrian and cycle access will join the Link Road in the north of the site to the Barnhall Roundabout entrance in the south-east via the designated view corridor. An additional pedestrian and cycle access will be located along the eastern boundary of the site providing a second link between the new Link Road and the Barnhall Road Roundabout entrance.

CCTV cameras will be installed at strategic locations around the campus to ensure that the site surrounds are appropriately monitored. The lighting design (both security and environmental)

has been assessed and optimised for the site, to ensure no obtrusive glare, light spillage or other light nuisance on neighbouring residential receptors or campus users. A lighting report was prepared by Ethos and is included within the planning application documentation.

Site Roads and Parking

Three vehicular access points are proposed into the site:

- The main entrance to the site will continue to be Barnhall Road accessed via the M4 Junction 6 Roundabout.
- The secondary entrance onto the R404 will be redesigned to accommodate a new link road from the main entrance (referred to as the R404/Site North Access Junction).
- The third access point onto the R404 via the existing roundabout.

The new Link Road will connect Access Points 1 and 2. This will be constructed to National Road standards to facilitate through traffic. This has been designed to meet objective MT3.12 of the LLAP 2020-2026 which seeks a *"new link road from the Celbridge Road (R404) to the south of the M4 connecting to the M4 Leixlip/Celbridge Interchange".*

A Design Manual for Urban Roads and Streets (DMURS) compliant statement accompanies the application. Refer to RKD Drawing *KIC-RKD-ZZ-ZZ-DR-A-1030* for further detail on proposed access and road layouts. Access arrangements and potential traffic safety impacts are considered in Chapter 13 (Traffic).

New carparking is provided in the form of 2,291 no. spaces across the entire campus (including existing parking to be retained). 196 of these are to be allocated to the combined new data centre units and 1,163 allocated to the deep tech use element. The balance will service the existing uses, energy centre, substation and other infrastructure on site.

A total of 246 (10.7%) of the total car parking numbers will be equipped with electric vehicle charging points and marked for EV vehicles only. A car parking hub, which will be accessible by the public, is proposed within car park identified as Car Park 1 which is adjacent to the exiting building 1 / main campus entrance.

The development proposals also include plans for 119 dedicated mobility impaired parking spaces that will be dispersed throughout the campus close to each of the building access points. This represents 5% of the total number of planned parking spaces. Refer to the submitted *Transport Assessment* by Systra and Chapter 13 (Traffic) for further detail.

Electric Bus Charging Hub

A new Electric Bus Charging Hub is proposed to be provided adjacent to the existing Building No.4. The Electric Bus Charing Hub will contain parking and charging for 10no. Electric Buses. The Buses charged on site will be associated with a privately operated bus provider. Buses charged at the depot would be related to an existing service provider rather than the introduction of new route.

The Charging Hub will be used as a charging facility for the buses. It will not be a stop on the network or publicly accessible, rather buses will return to the site upon completion of their transfers to re-charge and then leave to commence a new route. The traffic impacts associated with the bus movements are minor and account for c.40 bus movements departing/returning

to the campus with the 24hr period. Bus movements will be spread across the 24hr period and will align with the ultimate operator's timetable. The landowner is in discussions with a number of potential operators with the final operator yet to be determined. Refer to Chapter 13 (Traffic) for further detail.

2.6 Phases of the Project

The below section sets out all aspects of the lifecycle of the project under the following headings:

- Proposed Phasing of the Principal Works
- Description of Construction
- Description of Commissioning
- Operation of the Project
- Changes to the Project; and
- Description of Other Related Projects.

2.6.1 Proposed Phasing of the Principal Works

The proposed development will be delivered through a three-stage phasing plan. The rationale behind the phasing is to ensure that each 'phase' can be properly completed and can stand alone, while forming part of the larger campus masterplan and to ensure that subsequent phases can be implemented without negatively impacting on previously completed development. The phasing approach is based on the worst likely case to assess the environmental impact of the proposal. The development phasing will be used to inform the assessment of cumulative impact through the EIAR.

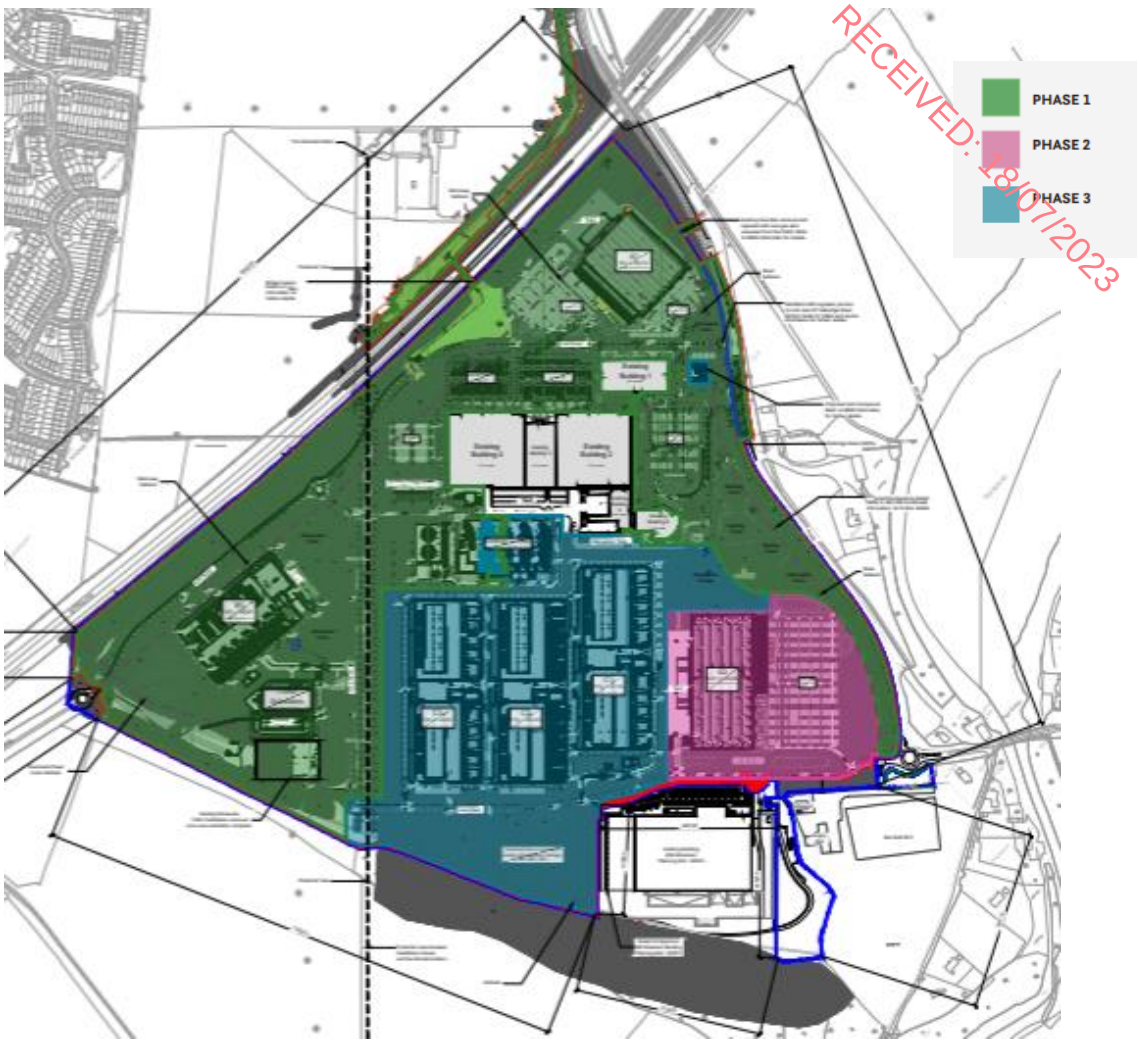


Figure 2.11: Kildare Innovation Campus Phasing Plan. Source: RKD Architectural Design Statement and Drawing A-1041.

Phase 1 (c.2024 - 2027)

1. Building A1 (Deep Tech) with associated carparking, landscaping, services yard etc. The existing buildings Nos 1-9 will be retained and operated as currently. No works are proposed to these buildings.
2. Building B1 (Data Centre) will be constructed fully in Phase 1 but will only utilise 16MW power. Power to the building will ramp up to a c. max of 32MW during Phase 3 of the development.
3. The new replacement 110kV Substation will be developed adjacent to the existing 110kV Substation. Once the new replacement substation becomes energised, the existing 110kV substation will be decommissioned. Associated grid diversion to the new substation will also be included in Phase 1.
4. The energy centre will be delivered in phases to align with power demand for the site and dispatchable energy requirements of the grid. The initial phase of the masterplan will include the provision of 1no. CTG powered by the enhanced gas line to the site. Supporting infrastructure within the energy compound will also be provided.

5. Public Link Road connecting the R449 Barnhall Road to the R404 Celbridge Road with a new signalised intersection at the R404 will be constructed. The existing signalised intersection will be removed, and road and access reinstated.
6. The M4 Pedestrian and Cycle Overpass including links to the entrance of Barnhall Meadows estate and the connections along the protected view line will be developed.
7. The Electric Bus Charging Hub will be constructed providing parking and charging for 10no. privately operated buses.
8. Modifications to the existing parking lots 1 and 2 to increase the parking provide and include EV and accessible stalls.
9. Hard and soft landscaping will be provided throughout the Phase 1 area as well as the required earthworks, drainage, services, utilities and new gas skid.

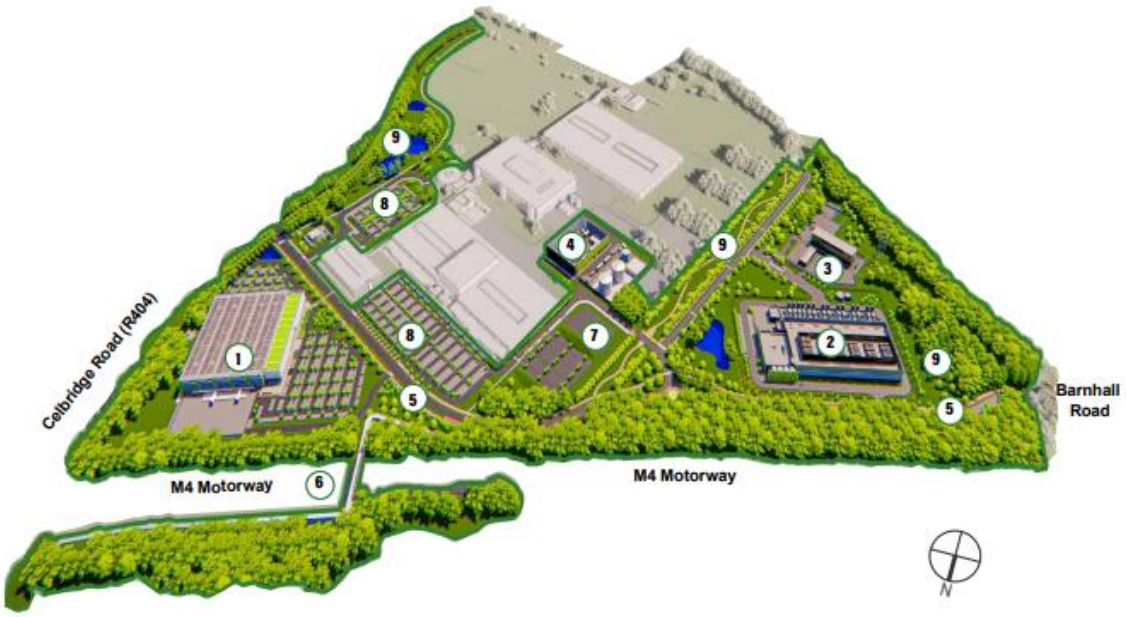


Figure 2.12: Kildare Innovation Campus Phase 1 Plan (Green Outline). Source: RKD Architectural Design Statement

Phase 2 (c.2026 - 2028)

1. Building A2 (Deep Tech) with associated carparking, landscaping, services yard etc.
2. Hard and soft landscaping will be provided throughout the Phase 2 area, including the required drainage and services.

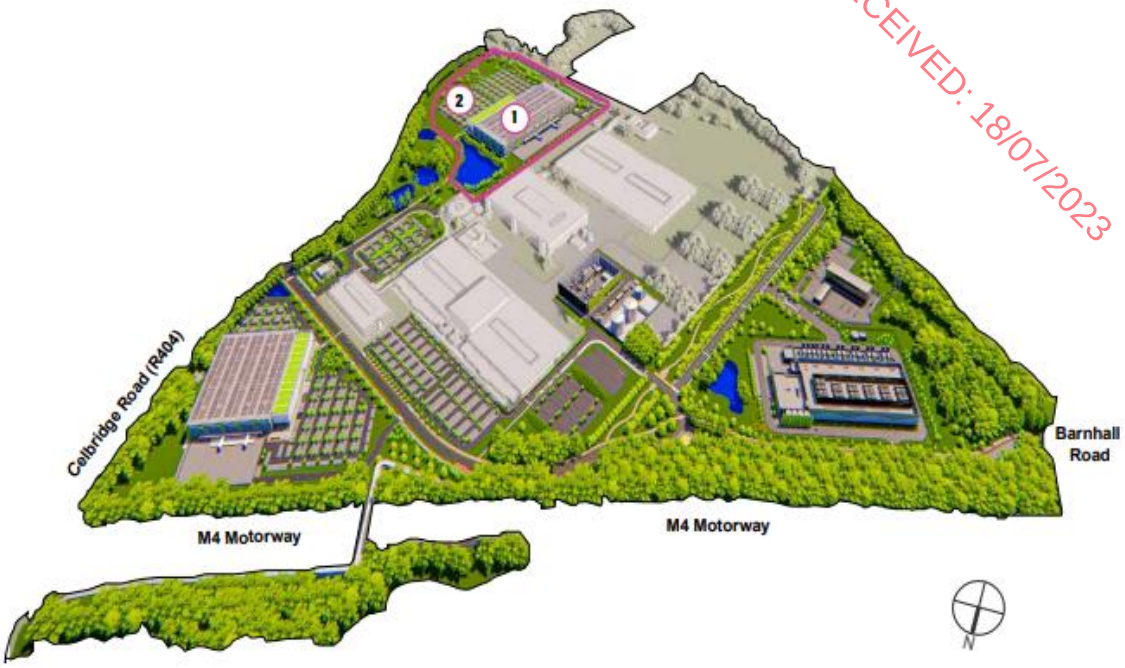


Figure 2.13: Kildare Innovation Campus Phase 2 Plan (Purple Outline). Source: RKD Architectural Design Statement

Phase 3 (c.2028 – 2035)

1. Demolition of Existing Buildings No. 7, 8 and 9. Provision of new Data Centre Buildings C1, C2 & C3 with associated parking, landscaping, building services, etc.
2. The Energy Centre final phase will align with power demand for the balance of the site and dispatchable energy requirements of the grid. The third phase of the masterplan will include the provision of 8no. turbines powered by a local extension of the gas transmission network by GNI. The turbines will be capable of operating off biogas as well as natural gas and will be located within 14m high enclosed area.
3. The existing campus road which provides entrance from the Celbridge Road roundabout and access to DB Schenker will be extended and linked up with the internal campus road adjacent to the view corridor. All associated cycle paths and footpaths will be linked up infrastructure will be demolished to make way for the build out of Phase 3.
4. Hard and soft landscaping will be provided throughout the Phase 3 area, including the required drainage and services.

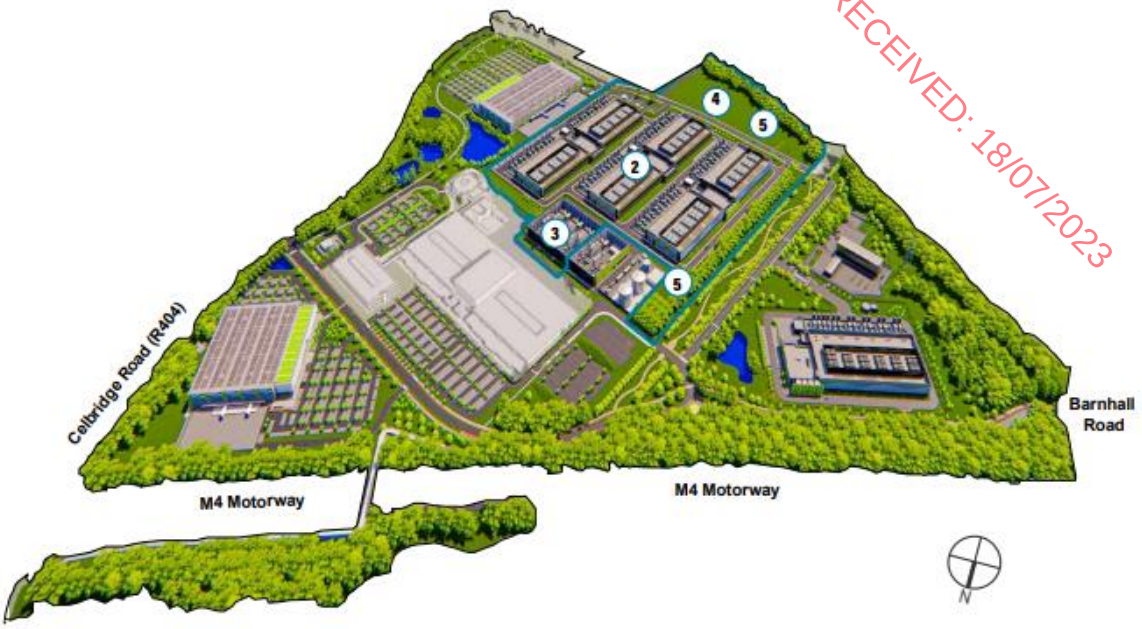


Figure 2.14: Kildare Innovation Campus Phase 3 Plan (Blue Outline). Source: RKD Architectural Design Statement

2.6.2 Description of Construction (Principal Works)

Introduction

It is estimated that the construction programme for the works associated with the proposed development will span over an 11-year period from the date of commencement. This estimation is based on the landowner's approach to providing a long-term phasing approach to the site, the availability of electricity supply, the lead in time for materials. In the event that the phases are not developed as per the above approach (due to unforeseen circumstances) the construction period may extend, having regard to the nature of the project and the need for flexibility, contractor pricing etc. It is important to note that the mitigation measures outlined in the EIAR will ensure that an extension to the construction period will not have a negative impact on the receiving environment. A Construction Management Plan has been prepared by CSEA and is included with the application, which includes further detail on timing and phasing. The CEMP will be refined by the construction contractor and submitted to Kildare County Council prior to commencement of development and will include the mitigation measures set out in this EIAR.

This EIAR presents measures to mitigate against any potentially significant adverse impacts for residential and working communities in the vicinity of the site. The proposed development, as described, is detailed on the planning application drawings and particulars which accompany the application.

Construction of the development the subject of this application for approval involves the following principal elements per development phase:

- Demolition of existing structures (where applicable), site strip & associated earthworks.
- Construction of new buildings and structures.
- Construction of ancillary on-site infrastructure including attenuation ponds, and attenuation tanks.
- Buried site services installation.
- Construction of roads, footpaths & hard/soft landscaping.
- Internal Fit Out.
- Connection to public services.

Existing Ground Conditions

Ground works will be required to clear the site and to facilitate construction of building foundations, access roads, the installation of utilities and landscaping. The Land, Soils, Geology & Hydrogeology Chapter of the EIAR (Chapter 7) details the existing ground conditions at the site and provides a summary of the anticipated stratigraphy of the soil beneath the site.

There will be an increase in overall hardstand as a result of the proposed development of c. 171,641.88 m*2*. The existing site has a total hardstanding of c. 86,029.00 m*2*. The proposed development will have a total hardstanding of c. 257, 670.88 m*2*.

It is predicted that 115,117m3 of the cut material generated during site preparation/levelling (365,750 m3) will be reused to facilitate construction of the proposed roads, carparks, buildings and landscaping berms. It is estimated c.250,634m3 will be exported off the site and disposed of in accordance with relevant requirements. No fill will be required to be imported to the site to accommodate the development.

The surplus material that requires removal from site for offsite reuse, recovery and/or disposal and any potentially contaminated material (in the unlikely event that it is encountered), should be segregated, tested and classified as either non-hazardous or hazardous in accordance with the EPA publication entitled 'Waste Classification: List of Waste & Determining if Waste is Hazardous or Non-Hazardous' using the HazWasteOnline application (or similar approved classification method). If the material is to be disposed of to landfill, it will then need to be classified as clean, inert, non-hazardous, or hazardous in accordance with the EC Council Decision 2003/33/EC and landfill-specific criteria. This legislation sets limit values on landfills for acceptance of waste material based on properties of the waste including potential pollutant concentrations and leachability.

The surplus soils and stones may be suitable for acceptance at either inert or non-hazardous soil recovery facilities/landfills in Ireland or, in the event of hazardous material being encountered, be transported for treatment/recovery or exported abroad for disposal in suitable facilities.

Demolition & Site Preparation

Demolition works will be spread across the relevant development phases. During phase 1 & 2, demolition will be confined to the demolition of the existing campus access road, the existing haul road in the KCC lands and hard surface areas within the phase 1 & 2 works areas. Phase 3 of the development will include the demolition of existing Buildings No. 7, 8 and 9 including associated infrastructure. Demolition works have been assessed in the relevant chapters of the EIAR.

It is proposed that the accesses and haul roads for vehicles, the contractors' compound and fencing will be established for the proposed development utilising the existing entrance from Barnhall Road as the primary construction entrance for this development. The primary activities that will be required during the site preparation phase for the development will be site clearance, excavations and levelling of the site to the necessary base level for construction, demolishing existing buildings and roads, surveying and setting out for structures and any rerouting of services/connections to future locations. A combination of excavators, trucks and other soil shifting plant will commence the main site clearance, demolitions, and levelling aspects on a phase by phase basis.

Construction of new buildings and structures.

Foundations & Structure

Following the completion of site clearance, demolition and levelling, all structures will require foundations to the structural engineers' specifications. Building structures will comprise of standard structural steel frames. It is anticipated that foundations will require moderate scale excavations. Local minor dewatering may be required during excavation works and groundworks.

Levelling/Cut and Fill

It is predicted that 115,117m3 of the cut material generated during site preparation/levelling (365,750 m3) will be reused to facilitate construction of the proposed roads, carparks, buildings and landscaping berms. It is assumed that the majority (but not all) of the topsoil/cut material will be re-used on site. Contractors will be required to submit and adhere to a method statement (including the necessary risk assessments) and indicating the extent of the areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works. Any temporary storage of spoil required will be managed to prevent the accidental release of dust and uncontrolled surface water run-off which may contain sediment etc.

Roads, Servicing and Landscaping

Following on from completion of site clearance, demolition, site re-profiling works construction activities will focus on the installation of underground utilities to provide the infrastructure required for storm water drainage, foul water drainage, water supply, power, district heating network and infrastructure that will allow for the use of recycled heat for the existing campus buildings and proposed A1 & A2 development and building utility systems. This will be carried out on a phased basis and principally follow the proposed road network.
The new internal road network will be initially composed of hard-core material, rolled and compacted to support initial construction including civil/structural sub grade works. Excavations will be required for site levelling and preparation and the installation of services. The impact of these excavations and volumes of excavated material generated from them has been taken into account throughout this EIAR. Refer to Chapter 12 (Material Assets – Waste) for further detail.

Hard & soft landscaping will be undertaken and completed during the commissioning of the relevant project phases.

Building Envelopes and Finishes

The outer finishing of the building envelopes are to be of high quality as set out within the Architectural Design Statement. The proposed M4 Overpass will be a high quality and similar in design and appearance as the Waterford Greenway crossing of the N25 at Kilmacthomas.

Site Accommodation & Site Parking

The site office and welfare facilities will be situated on site at an agreed location within the site boundary. It is anticipated that the site office and welfare facilities will relocate as each phase is completed to the next phase. This will allow the developer to utilise the completed phase. All of the sub-contractors as well as the main contractor and project managers will occupy offices in the same area. The site parking for staff, contractors and visitors will also be located in this area. It is proposed to provide 400 spaces on site for parking. Allowing for a car occupancy of 1.5 average this provides parking for 600 workers.

Refer to CEMP prepared by CSEA and submitted with the application for further detail.

Hours of Working

Each Phase of the development will have varying construction periods. Majority of works are to be done off-road within the site boundary, with the exception of the removal and provision of the new existing signalised intersection, the works to lift the new M4 Overpass into place and service connections.

During the off-road section of works, construction staffing personnel will arrive prior to 07.00am to mitigate against traffic peak. Site development and building works shall be carried only out between the hours of 08.00 to 19.00 Mondays to Fridays inclusive, between 08.00 to 14.00 on Saturdays.

Deviation from these times will only be allowed in exceptional circumstances (such as the M4 bridge lift and works to the signalised intersection) where prior written approval has been received from Kildare County Council. Such approval may be given subject to conditions pertaining to the circumstances being set by Kildare County Council.

Deliveries of material to site will be planned to avoid high volume periods. There may be occasions where it is necessary to make certain deliveries outside these times, for example, where large loads are limited to road usage outside peak times. There may be occasions where it is necessary to have deliveries within these times. The Contractor will develop, agree and submit a detailed Construction Traffic Management Plan, to KCC, for the project prior to commencement. The CTMP will implement the relevant mitigation measures contained in the EIAR.

Cranes

Fixed cranes will not be required on site. Mobile cranes may be used for some activities. All materials being lifted by crane will be controlled by guide ropes and will only be carried out under the strict supervision of appropriately qualified and experienced banksmen. The Contractor will engage with Weston Airport to undertake a preliminary screening assessment to confirm the associated mobile cranes that may be utilised during the construction, would have no impact on instrument flight procedures at Weston Airport prior to commencement. Refer to CEMP prepared by CSEA and submitted with the application for further detail.

Hoarding and Site Segregation

The new works will be hoarded off or fenced off from the public at all times and existing parts of the campus. Heras type fencing will be used on short term site boundaries where appropriate to suit the works. The fencing alignment and specification are to be confirmed by the Contractor prior to commencement. Controlled access points to the site, in the form of gates or doors/turnstiles, will be kept locked for any time that these areas are not monitored (e.g. outside working hours). During working hours, a gateman will control traffic movements and deliveries at any active site access to ensure safe access and egress to & from site onto the public roads. All personnel working on site must have a valid Safe Pass card and be inducted by the Main Contractor with regard to site specific information.

Noise and Dust Management

The main contractor will be required to be accredited with ISO14001 Environmental Management Systems. The main contractor will be required to mitigate the impact of the construction works and the mitigation measures set out in this EIAR and CEMP.

Construction Traffic Management

During construction of the proposed development, construction traffic will travel to and from the site via the construction site access located on the east section of the site. It is expected that the origins and destinations of construction traffic will continue to match the distribution of traffic currently using the surrounding road network with the majority of construction traffic via the M4 Road.

A total of 400 car parking spaces will be provided on-site. The following measures will be put in place during the construction works:

- The contractor will be required to provide wheel cleaning facilities, and regular cleaning of the main access road;
- Temporary car parking facilities for the construction workforce will be provided within the site and the surface of the car park will be prepared and finished to a standard sufficient to avoid mud spillage onto adjoining roads;
- Monitoring and control of construction traffic will be ongoing during construction works. Construction Traffic Management will minimise movements during peak hours.
- Construction Traffic routes minimising traffic impact on surrounding residential development will be used by construction vehicles.
- Material deliveries and collections from site will be planned, scheduled and staggered to avoid any unnecessary build-up of construction works related traffic.

Reinstatement / Road Cleaning

Prior to the works commencing, detailed photographic surveys (condition schedules) of adjoining walls, roads, footpaths, fences etc. is to be prepared. Copies of the relevant parts are to be made available to adjoining owners and KCC. This record will form the basis of assessing repairs to adjoining areas in the future should a dispute arise as to their cause. Roadways are to be kept clean of muck and other debris. A road sweeping truck is to be provided as necessary, to ensure that this is so.

Reinstatement at completion of the works will involve:

- Testing and cleaning of all watermains in the development to the requirements of the IW / KCC prior to connection to the public watermain. This will reduce the risk of contamination to the public water supply when the new network is connected to the system.
- Repair of any damage to any adjacent public roadways, kerbs, grass verges etc. in accordance with KCC requirements.
- Reinstatement of all excavations to the requirements of KCC.
- Leaving the area in a neat and clean condition, removing all deleterious materials that may have been deposited during construction works.

2.6.3 Description of Construction (Facilitation Works)

GNI Facilitation Works

GNI Installation Activities

Typical trench cross sections for works in roads and fields are shown in Figure 2.14 below. The required trench will have a nominal depth of 1,080mm and width of 480mm in roads. The required trench will have a nominal depth of 930mm and width of 480mm in fields (Barnhall Meadows and KIC Lands).

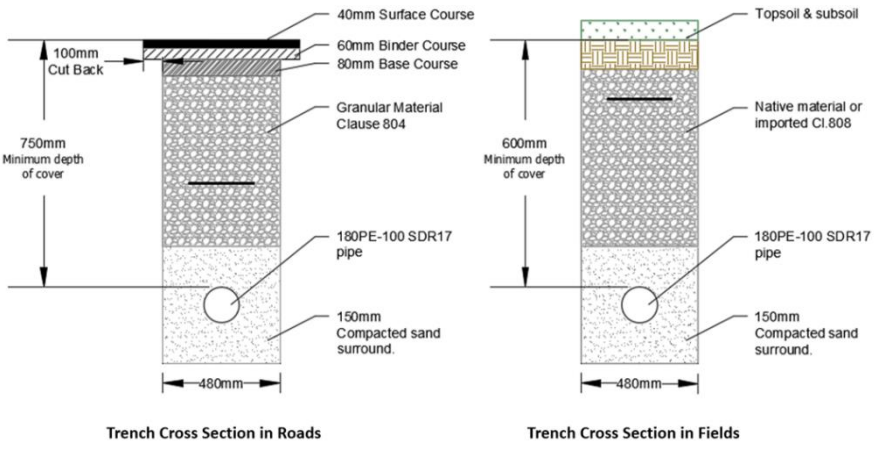


Figure 2.15: Typical GNI Trench Cross-Sections in Roads and Fields. Source: MDM Engineering

The 140m pipeline trenching and installation in lands adjacent to the Haul Road within Barnhall Meadows and within KIC lands will be undertaken by clearing the site area, stripping of top-soil which will be stored and reused. The works access will seek to utilise the existing Haul Road within this area. The pipe will be welded together alongside the trench and laid in the trench. The trench will then be reinstated using existing material and a small quantum of imported material if required.

Within the existing road area's the works will be carried out in discrete areas at distances of c.20m to minimise traffic impacts. Appropriate traffic management will be put in place

through a GNI Traffic Management Plan. The road surface will be broken out and material removed from site for recycling and/or disposal. The trench will be excavated and prepared in accordance with configuration shown in Figure 2.15 above. Excavated material will be removed from site for recycling and/or disposal. The pipe string will be welded together alongside the trench and laid in the trench. The trench and the road will be reinstated to match the existing structure and in accordance with the road authorities requirements.

The 180m crossing of the M4 Motorway by HDD will be undertaken with entry from the disturbed Barnhall Meadows lands adjacent to the existing Haul Road and exit within the Campus lands in proximity to the proposed A1 building. A drill entry site of 30m x 40m and a drill exit site of 20m x 30m are required. Drill entry and exit pits will be excavated and lined with geotextile and polyethylene sheet to avoid seepage of drilling fluids into the surrounding soils. The HDD will avoid tree removal. All works to occur outside Root Protection Areas (RPA's). HDD will be significantly below the Root Protection Area's of the trees on both sides of the M4.

The pipe string will be fabricated by welding together pipe sections and strung out in one single length from the HDD exit point. The pilot bore is completed by adding drilling rods to the rig as the drill head is driven forward along the desired drill profile. Drilling fluid is pumped through the hollow drill rods throughout the process. The fluid supports the bore wall, lubricates the drill head and drill pipe, and flushes cuttings back to the drill entry pit for removal and disposal. The drill profile is followed by monitoring the position of the drill head and is directed along the desired drill profile. The drill head's real-time position is recorded throughout the drilling process. General tolerances for the drill profile are less than 3m of the desired centre line for the entire length of the bore. The pilot bore is complete when it punches out at the drill exit site. Once the pilot bore is completed, the bore will be enlarged by reaming to the required size to pull in the pipe string. After the drill punches out at the exit pit the drill head is removed and a reamer attached. The drill bore is widened by successive reaming passes. A final cleaning pass of the bore confirms the condition of the bore and its readiness for pipe installation. Following the completion of the drill bore the pipe string will be attached to the drill pipe following the final pass of the reamer and pulled back through the drill bore to the drill entry pit. Once the pipe has been installed it will be pigged through its entire length and capped for later joining to the other pipe sections. On completion of the works all equipment will be demobilised and removed from the sites and the site areas will be restored to their original condition.

Dewatering

Dewatering will generally be one of three options depending on the local authority requirements and engagement with relevant stakeholders such as inland fisheries etc. These options would be (1) Temporary Bund used for filtering and settlement, test and leave into the watercourse, (2) utilise storm drain if available (3) pump and export for treatment/disposal.

Future Consents & Timing

A Section 39A consent under the Gas Act of 1976 will be required to construct the pipeline. This consent will be obtained from the CRU. An Environmental Impact Assessment and Appropriate Assessment Screening will be required to be undertaken as part of the consent process.

The future gas pipeline construction will take c.10-12 months, with pipe-laying scheduled to occur between the months of March and October with full reinstatement the following summer.

Eirgrid Uprating Facilitation Works

Power Lines and Polesets

Generally, Over Head Lines (OHL) are built as a mixture of 200mm², 300mm² and 430mm² depending on the requirements at the time OHL was built.

- When ESB upgrade the OHL they generally replace the conductor with a 430mm² ACRS Bison which will require Poleset replacements, cross-arms and insulators due to the additional weight that has to be supported by the line. Refer to Appendix 2.1 for typical Poleset.
- Equipment used in OHL upgrades will include both mobile cranes and Mobile Elevated Work Platforms (MEWP).
- Where poleset replacement occurs, existing foundations and structures will be utilised.
- There are no changes foreseen as being required in the transmission line with circuits built with 430mm ² conductors, the limiting factor would be within station boundaries.

Angle Towers and DC Towers

In general, there are no requirements to replace towers when conductors are uprated to 430mm² but some designs have to be done and insulators/steel works may be replaced. Typical equipment used in upgrades would include Excavators, Concrete trucks, Cranes and MEWPs.

Conductor Replacements
OHLs are built as a mixture of 200mm², 300mm² and 430mm² depending on the requirements at the time OHL was built. To uprate to 430mm², the following typical works would be required:

- the utility would have to disconnect the old conductor and pull the new one utilising a four drum puller
- the puller has 4 spools of rope which run up to sheaves (pulleys) on the pole, and then over to wires on the other pole
- Ropes are tied to wires on the other pole. Puller pulls the ropes and wire from pole to pole.
- No changes are expected when uprating circuits built with 430mm² Conductors in powerlines (tower).
- Typical equipment used in upgrades would include Cranes, MEWPs, Conductor Puller, Ropes and tractors.

Substation equipment also has to be assessed by ESB/Eirgrid to ensure compliance. Transformers, switchgears, cables and protection systems are usually the limiting components on substations and may require replacement.

2.6.4 Description of Commissioning

It is envisaged that the project will follow the phasing outlined in section 2.6, above. Dates are dependent on planning being granted and funding and all permits being in place.

Once the buildings are constructed, the likely fit out works for all buildings will include *inter alia* partitions, mechanics, electrics, sprinklers, joinery, ceilings, flooring, furniture and fixtures.

Specialist contractors will be mobilised to complete the commissioning of the deep tech buildings and data centres, which will include installation of bespoke equipment.

The Energy Centre will, for Phase 1, be able to operate using gas supplied from GNI via the existing gas pipelines on site; however, Phase 3 will require the facilitation GNI upgrade pipeline to be constructed and connected to the principal site.

The 110 kV substation will be constructed in Phase 1 and will connect to existing lines on site currently providing power to the existing 110 kV Rinawade substation. It will have the capabilities to provide electricity to the existing campus and Phase 1 and Phase 2. Upon completion of Phase 1 of the KIC Masterplan, including the development of the 110kV substation, uprating of existing overhead lines from the replacement 110kV Rinawade substation to Derryiron/Maynooth and Dunfirth/Kinnegad will be required to facilitate commencement of Phase 3 of the Masterplan.

The facilitation works will have to receive planning consent, including assessment by the competent authorities of their environmental impacts, prior to development.

2.6.5 Operation of the Project

The operation of the project and expected employee numbers etc are discussed in the above section 2.5 above. Noise, vibration and air emissions and climate impacts associated with the operation of the project are set out and assessed in Chapter's 9 – 11 of this EIAR. Waste and Traffic associated with the operation of the project is set out and assessed in Chapter's 12 and 13. Demand on site services and energy is set out and assessed in Chapter 14.

2.6.6 Changes to/Decommissioning of the Project

It is not intended that the development associated with the project will be decommissioned. The lifespan of the proposed development is not defined but is anticipated to be approximately 15 – 25 years for the deep tech buildings and data centres and c. 25 years for the Energy Centre without significant modification or upgrades. It is likely that regular maintenance and periodic upgrading of the facility over time will enable it to continue to meet future demands.

The lifespan 110kv substation is anticipated to be approximately c. 30+ years with upgrades and routine maintenance as required.

Upon closure, all buildings, plant, equipment, drainage networks etc. at the site will be fully decommissioned in accordance with prevailing best practice. The buildings once rendered environmentally safe will more than likely be retained and sold on for future use following closure.

The facilitation works have a life expectancy of c.30+ years and would be replaced/repaired as required to provide greater capacity or stability to the energy infrastructure.

At present, there are no planned changes to the final built out of the project over its expected lifetime.

2.6.7 Description of Other Projects to be considered as part of the cumulative assessment.

A list of other developments in the vicinity of the Proposed Development is provided in Chapter 3 (Planning and Development Context) of this EIA Report.

2.7 Sustainability Energy Efficiency & Resource Use

The planning documents include an *Energy and Sustainability Statement* prepared by Ethos which outlines how the energy performance, and the sustainability of construction meets or exceed legislative and planning requirements. In addition, the Statement outlines how the proposed development meets the objectives set out in the Kildare development plan. The following is a summary of the measures included in the proposed design:

Building and Plant Design

The development is designed to achieve (as a minimum) Building Regulations (Part L) compliance and a BER of A rating building:

- Passive Solar Design to minimise solar gain to reduce cooling energy requirements
- The building fabric of the new development will be designed and constructed to limit heat loss and where appropriate, limit heat gains through the fabric of the building.
- Full mechanical Heating, Ventilation and Air Conditioning (HVAC) systems will be utilised in the data centre, energy centre and Deep Tech buildings due to the high occupancy levels and deep floor plates which means that a natural ventilation strategy is not feasible. However, the mechanical HVAC strategy is to minimise energy associated with space conditioning through the use of high efficiency systems, heat recovery and the efficient control of both ventilation rates and of heating and / or cooling supply.
- High Efficiency Electrical Systems including low energy lighting solutions and power factor correction.
- Sustainable Energy Initiatives including recycled heat recovery
- Data Processing Area Electrical Design Elements (transformers, emergency back up generators, high efficiency external and internal lighting.
- Data Processing Area Mechanical Design Elements (Water demand reduction and rainwater harvesting, data storage room environmental design, use of direct evaporative Air Handling Units (AHUs) and use of an electronic building management system for air handling,
- Offices & ancillary Areas Mechanical & Electrical design elements including high efficiency air conditioning, energy efficient heat recovery units for air ventilation systems, efficient low energy LED lighting and control systems, PV panels, electric vehicle charging infrastructure).

Energy Security

A connection agreement has been reached with Eirgrid for the first phase of the proposed development. Additionally, it is noted that the current power supply to the campus via the existing 110kV Substation is not supplemented with dispatchable power. This will change as a result of the proposed KIC development, as the existing power demand through the Rinawade 110kV substation will, once the initial data centre becomes operational, be met with equal or greater dispatchable power, meaning that the proposal will provide a net improvement to grid reinforcement for the benefit of all users.

The Commission for Regulation of Utilities (CRU) has advised that the power system is facing potential capacity margin shortfalls over the next few years – effectively meaning there is a likelihood that projected generation supply may not be enough to meet forecast demand at peak demand periods.

The proposed development will include its own energy centre to be built out over the life of the masterplan. The energy centre will be supplied by GNI's enhancement of the existing supply to the campus. The Energy Centre will include natural gas fired turbines, supplemented by bio-gas, to relieve generation constraints cause by renewable intermittency. Further to this, the energy centre could also be capable of providing reinforcement to grid if and when required. In addition to the energy centre providing support, it will also provide additional inertia to the grid which results in increased frequency stability.

Decarbonisation

KIC is committed to a future of carbon neutrality for the entire campus through a range of mechanisms. The developer and data centre end user are committed to continued renewables additionality nationally and investment in new generation, repowering or otherwise increasing in-country renewable energy capacity. In this regard the proposed development will have a Maximum Import Capacity (MIC) of 170MW once fully developed (c.2035). The development will be delivered in phases over a 10-year period, as such the data centre energy demand will ramp up over a significant period of time. It is proposed to proportionally match the impact of the forecasted energy demand through a mix of renewables on site and CPPA's.

On site commitments include:

- Provision of significant Solar PV installations with c.8,560 panels being proposed across the 4no. data centre buildings and the 2no. Deeptech buildings.
- Use of Hydrotreated Vegetable Oil (HVO) as back-up fuel source for the Energy Centre upon full build out rather than diesel.
- Implement District Heating system, which will use recaptured heat produced from the data centres to provide recycled heat the existing campus buildings being retained as well as the new buildings A1 and A2. Further to this, the district heating system has been designed to provide export heat to surrounding community uses.

The future data centre end user will commit to entering into arrangements which are capable of underpinning new renewable energy generation calculated to offset the energy consumed by the proposed data centre development from the electricity grid. It is proposed that these arrangements would ramp up overtime in line with the operation of the data centre use and would be secured in the in the form of CPPAs and provide for the establishment of new renewable energy generation projects by the data centre end user which demonstrates that the energy consumed by the data centre development on site is offset with renewable energy generation.

The agreements may be on a phased basis and shall confirm:

- That the new renewable will not be supported by government or consumer subsidies.
- The new renewable projects will be located in Ireland.
- The new renewable energy projects will be provided by the data centre end user.
- The new renewable energy generation shall relate to energy that is not being generated at the date of which the proposal is permitted.
- The power ramping schedule for each CPPA to align with Data Centre power consumption.

The CPPA's will align with the ramping up of energy use by the proposed data centre development. In this regard, Phase 1 of the proposed data centre development is to be provided with c.16MW through an existing Eirgrid connection agreement. Phase 3 will include the balance of the proposed power capacity (c.154MW). The final signed CPPAs shall align with the proposed ramping schedule for each data centre building.

Further to the above CPPA's, Kildare Innovation Campus will commit to similar CPPA's for the offset of any non-renewables used by the proposed energy centre. CPPA's for renewable energy projects will include bio-gas and/or hydrogen as well as other available renewables. Final evidence of signed CPPAs shall include the proposed ramping schedule for the energy centre building and may be agreed in phases prior to occupation of the relevant phase of the energy centre.

The agreements for the energy centre may be on a phased basis and shall confirm:

- That the new renewable will not be supported by government or consumer subsidies.
- The new renewable projects will be located in Ireland.
- The new renewable energy projects will be provided by Kildare Innovation Campus.
- The new renewable energy generation shall relate to energy that is not being generated at the date of which the proposal is permitted
- The power ramping schedule for each CPPA to align with Energy Centre phase power consumption.

Refer to the *KIC – Response to the Principles for Sustainable Data Centre Development* submitted with the application and Chapter 10 (Climate) of the EIAR which assesses the climate impact of the proposed development.

Flood Management

Climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. As a result of this there is the potential for flooding related impacts on site in future years. A site-specific flood risk assessment has been undertaken as part of this planning application and adequate attenuation and drainage design have been provided for to account for increased rainfall in future years. The proposed development will have no measurable impact on flooding within or outside of the site boundary.

Water Management and Cooling

To reduce both energy and water use in its data centre facilities, the Operator utilises direct evaporative cooling systems, which predominately utilise outside air to cool servers. Thanks to this innovative cooling solution, the proposed data centre buildings are projected to demand as little as 0.75 l/s of water on average for each of the three C buildings and 0.50 l/s for the B building. The proposed buildings are designed to harvest a significant portion of the annual cooling water requirements through rainwater harvesting, reducing the water used from the local supply from the first year of operation.
The data storage rooms are supplied with fresh air which is sufficient to cool the space for the majority of the annual running hours. For a small number of hours during the peak cooling season, adiabatic cooling is required. Adiabatic cooling uses rainwater as primarily supply and mains water utility as a back-up at ambient temperature conditions to provide cooling on peak cooling days. The system does not require chillers/compressors which minimises the use of electrical power to maintain the data storage room environmental conditions. The rainwater harvesting will be utilised from the data centre roof throughout the year for the water to be available during those hottest periods during summer months when adiabatic cooling may be needed. The proposal is to also harvest rainwater from Deep Tech buildings to provide all irrigation for green walls across the site. The harvested rainwater will be utilised to offset the demand from Irish Water. Subject to yield studies, this has the potential to reduce the demand on the Irish Water network significantly.

2.8 Major Accidents and Disasters

The 2014 EIA Directive and associated EPA EIA Guidelines requires that the vulnerability of the project to major accidents, and/or natural disasters (such as earthquakes, landslides, flooding, sea level rise etc.) is considered in the EIA Report. The site has been assessed in relation to the following external natural disasters; landslides, seismic activity and volcanic activity and sea level rise/flooding as outlined below. The potential for major accidents to occur at the facility has also been considered with reference to Seveso/COMAH. Refer to Chapter 17 (Major Accidents and Disasters) for further detail.

2.8.1 Landslides, Seismic Activity and Volcanic Activity

There is a negligible risk of landslides occurring at the site and in the immediate vicinity due to the topography and soil profile of the site and surrounding areas. There is no history of seismic activity in the vicinity of the site. There are no active volcanoes in Ireland so there is no risk of volcanic activity. Further detail is provided in Chapter 7 (Land & Soils) and Chapter 8 (Hydrology & Hydrogeology).

2.8.2 Flooding/Sea Level Rise

The potential risk of flooding on the site was also assessed. A Stage 1 Flood Risk Assessment was carried out and it was concluded that the development is not at risk of flooding. Furthermore, it is not expected that the proposed development would adversely impact on flood risk for other neighbouring properties. Further detail is provided in Chapter 8 (Hydrology & Hydrogeology) and the *Site Specific Flood Risk Assessment* prepared by CSEA and submitted with the application for development.

2.8.3 Seveso/COMAH

As detailed in Section 1.10, the facility will not be a Seveso/COMAH facility. The only substance stored on site controlled under Seveso/COMAH will be diesel for generators (although there will be a preference for HVO) and the amounts proposed do not exceed the relevant thresholds of the Seveso directive. It is noted that the proposed energy centre will have a significant amount of back-up fuel stored on site, however this fuel will be HVO, a fuel not listed on the hazardous substances under the Seveso Directive therefore the Seveso/COMAH Directive does not apply to the site.

2.8.4 Minor Accidents/Leaks

There is a potential impact on the receiving environment as a result of minor accidents/leaks of fuel/oils during the construction and operational phases. However, the implementation of the mitigation measures set out in Chapters 7 and 8 will ensure the risk of a minor/accident is low and that the residual effect on the environment is imperceptible.

3.0 PLANNING AND DEVELOPMENT CONTEXT

3.1 Introduction

This chapter of the Environmental Impact Assessment Report has been prepared by Brian Minogue (BSc in Spatial Planning), Tom Phillips + Associates (TPA). In accordance with Directive 2014/52/EU, this chapter addresses the Planning Policy Context of the Project and the plans and projects which have the potential to act in cumulation with the project.

3.2 Project Site and Surrounding Land Zoning Objective

Principal Works Site

The Principal Works site is zoned 'H' - Industry and Warehousing – in the Leixlip LAP and, accordingly, the County Development Plan. The provision of employment generating uses on land zoned for development and within an existing business campus is strongly supported by the County Development Plan and the LAP.

The Proposal adheres to the land use zoning objectives identified in the LAP, including *inter alia* protecting views, and introducing link roads and pedestrian connections from Leixlip to Celbridge.

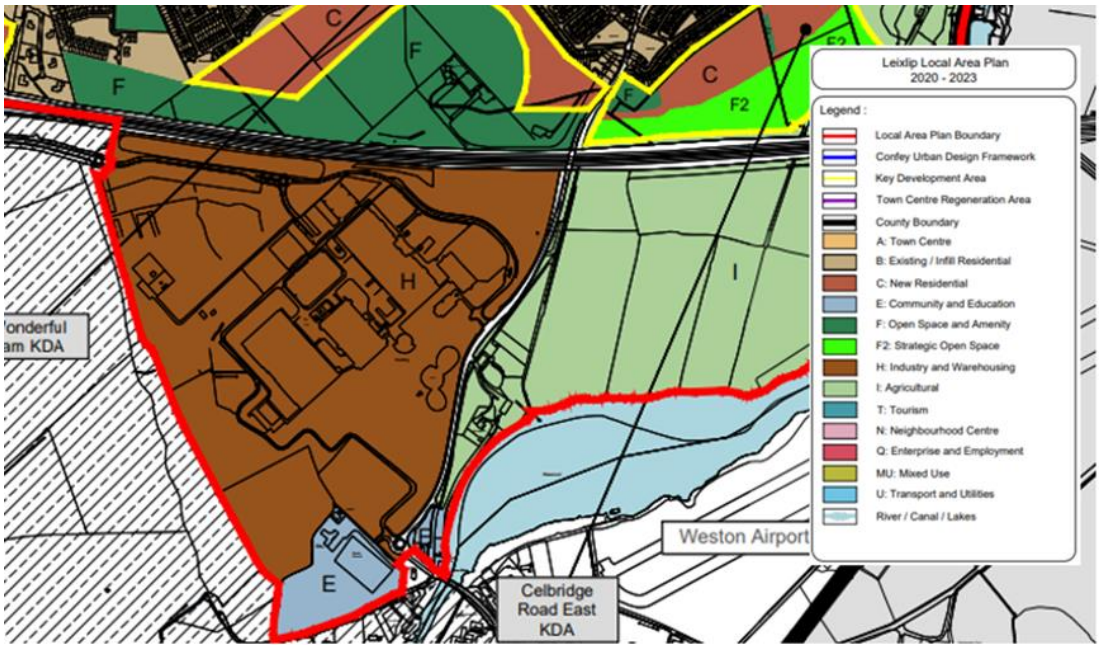


Figure 3.1: Extract Map Ref 4 Land Use Zoning Objectives Map, Leixlip LAP.

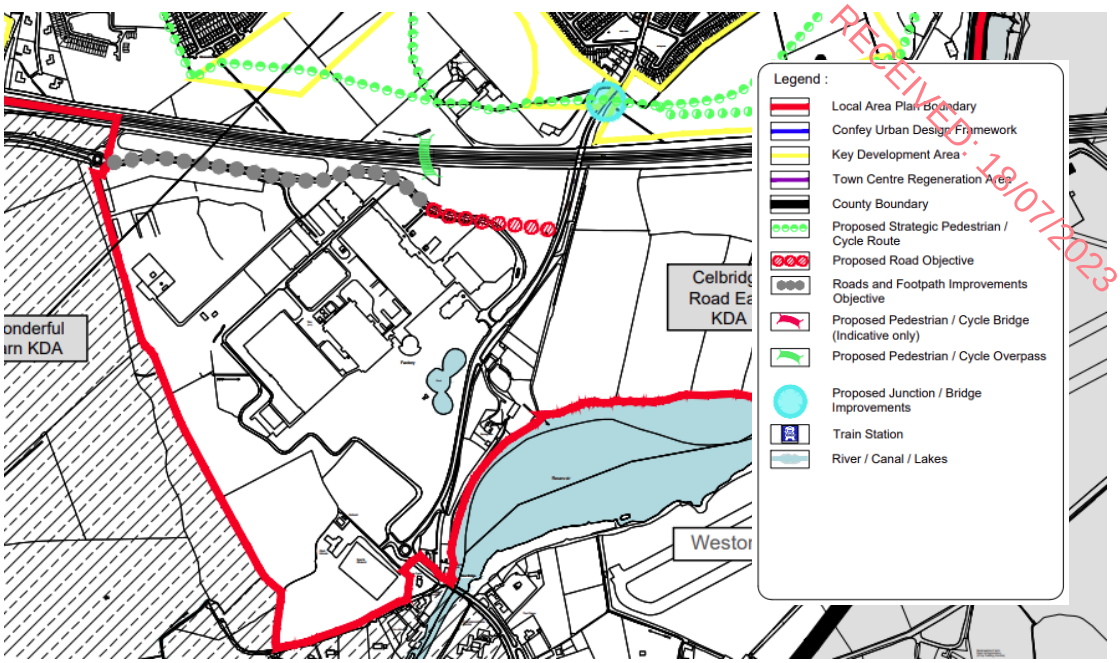


Figure 3.2: Extract Map Ref 4 Land Use Zoning Objectives Map, Leixlip LAP.

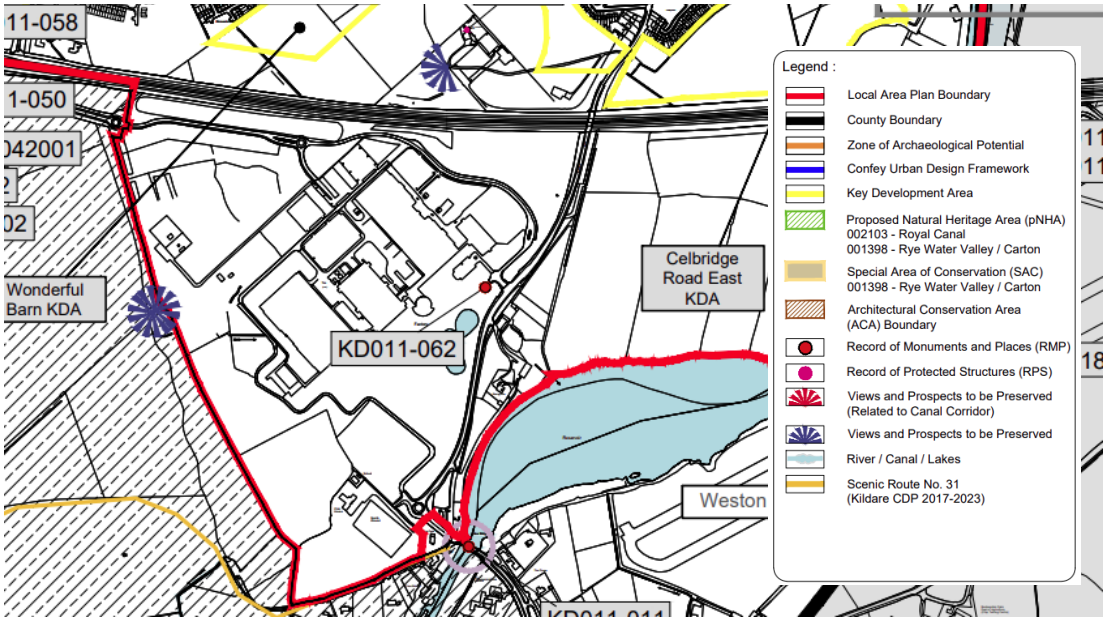


Figure 3.3: Extract Map Ref 4 Land Use Zoning Objectives Map, Leixlip LAP.

Facilitation Works Site

GNI Gas Upgrades

The pipeline works are all located within the Kildare County Council administrative area, the works will be within lands covered by the Leixlip LAP. The majority of the works will be under road and the lands are unzoned.

Prior to the pipeline entering the principal site, the works will enter the Barnhall Meadows Lands which are zoned 'F: Open Space and Amenity' under the Leixlip LAP which has the land-use zoning objective "*to protect and provide for open space, amenity and recreation*

provision". The gas upgrade works would not contravene the applicable land use zoning objective as while they constitute works, they have no effect of changing the current or any future potential land use. Furthermore, 'utility structures' are 'open for consideration' within the above zoning.

EirGrid Uprating

The works will primarily occur within unzoned – 'default agricultural' – land.g The works will involve uprating of existing lines, which will mean that any prospective land use objective – if within the path of the works – will unlikely be impinged by its operation.

3.2.1 Relevant Objectives & Policies

National Planning Framework (NPF)

The *National Planning Framework 2040 - Our Plan (2018)*, classifies County Kildare as being in the 'Mid-East' and it states within that region that there must be:

> *"a greater focus on addressing employment creation, local infrastructure needs".*

A number of the National Policy Objectives relate to employment development. These include, inter alia:

National Policy Objective 10b:

> *"Regional and Local Authorities to identify and quantify locations for strategic employment development, where suitable, in urban and rural areas generally."*

National Policy Objective 11:

> *"In meeting urban development requirements, there will be a presumption in favour of development that can encourage more people and generate more jobs and activity within existing cities, towns and villages, subject to development meeting appropriate planning standards and achieving targeted growth."*

The aims and objectives of the NPF with regard to the Eastern and Midland region are clear in their focus on the importance of sustainable employment provision.

Regional Spatial & Economic Strategy (RSES)

The *Regional Spatial & Economic Strategy (RSES)* for the Eastern and Midland Region outlines the Strategic Vision for the region which is:

> *"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."*

County Kildare falls under the sub-catchment of "Eastern Region" and the strategic catchment area surrounding Dublin known as the "Core Region":

> *"The Core Region contains a strong network of county and market towns that have a good level of local employment, services and amenities, which serve not just their resident populations but a wider catchment area."*

Section 4.2 of the *RSES* lists the subject site within the Metropolitan area of Dublin, the vision statement of which is to

> *"build on our strengths to become a smart, climate resilient and global city region, expanding access to social and economic opportunities and improved housing choice, travel options and quality of life for people who live, work, study in or visit the metropolitan area."*

Table 5.1 specifically mentions the subject site (former Hewlett Packard Site) as a strategic development area to *"strengthen employment base for North Kildare"*.

The role of Leixlip in terms of strategic employment development is noted in Table 5.2 of the RSES 2019-2031. It identifies the employment lands in Leixlip and their potential as follows:

> ***"Large scale former Hewlett Packard site*** *and Collinstown site* ***for regional enterprise to strengthen employment base for North Kildare."***
>
> [Our emphasis.]

Further, section 6.3 of the RSES 2019-2031 deals with Economic Strategy. Its *'Guiding Principles to Identify Locations for Strategic Employment Development'* are stated on page 130 of that document and include locations such as Liffey Business Campus where synergies can be created between existing uses and in proximity to public transport corridors.

Kildare County Development Plan 2023-2029

At a county and local level, the lands are governed by the Kildare County Development Plan 2023-2029, complemented by the Leixlip LAP 2020-2023 (extended to 2026).

The subject Hewlett Packard site is identified as a "Strategic Development Area", identified as an important area specifically zoned for knowledge-based economy focusing on high tech/biotechnology, research and development, ICT and manufacturing.

Hierarchy	Description	Locations	Sectoral Opportunities
	High Quality transport links and the capacity to act as regional drivers to complement the Regional Growth Centres.	Maynooth	Re-intensification of industrial lands in the northeast of the town. Exploit historic and amenity assets, regeneration of town centre to provide significant retail and commercial functions. Maynooth – knowledge-based employment focusing on ICT and manufacturing through the development of a research and technology campus. Further development of Maynooth University as a leading third level research and educational facility – potential synergies to large new and established employers. Development of St Patrick's College Campus for a mix of uses.
Strategic Development Areas in the MASP[1]	Leixlip – Former Hewlett Packard site and Collinstown site to Strengthen employment base for North Kildare. Maynooth - New Research & Technology Park adjoining Maynooth University.	North-West Corridor (Maynooth/ Dunboyne commuter line /DART)	Business Parks comprising knowledge- based economy focusing on high tech/biotechnology, research and development, ICT and manufacturing. Research and Technology
Self-Sustaining Growth Towns	Moderate level of jobs and services.	Newbridge Leixlip Kildare Town Athy	Biotechnology, ICT, professional services, High-tech manufacturing and research. Bloodstock, tourism, manufacturing, logistics, food and beverage products.

Figure 3.4: Economic Development Hierarchy Table. (Source: Table 4.1 Extract of Kildare County Development Plan 2023-2029.)

Chapter 4 of the Kildare County Development Plan 2023-2029 deals with the County's Economic Development. Section 4.4.1 states that:

> *"The MASP is a key policy driver which sets out an integrated land use and transportation strategy for the sequential development of the Dublin Metropolitan Area.*
>
> *The Dublin Metropolitan Area includes the highly urbanised settlements of Maynooth,* ***Leixlip****, Celbridge and Kilcock which have strong connections to Dublin City and County. A Metropolitan Area Strategic Plan is included in the RSES.* ***Strategic Development Areas have been identified at key nodes along high-quality public transport corridors in tandem with the delivery of infrastructure and enabling services.*** *Maynooth,* ***Leixlip****, Celbridge and Kilcock are located along the North-West corridor. In Maynooth, a new research & technology park adjoining Maynooth University has been identified for strategic economic development. I****n Leixlip, the former Hewlett***

Packard site and Collinstown site have been identified as strategic employment areas.

The focus is on achieving critical mass in the Metropolitan Area Strategic Plan (MASP) area (Maynooth, Leixlip, Celbridge and Kilcock)."

[Our emphasis.]

Section 4.4.5 further notes Leixlip as a Self-Sustaining Growth Town and states:

*"Newbridge, **Leixlip**, Kildare and Athy are designated as **Self-Sustaining Growth Towns in the County's Economic Development Hierarchy**. The RSES defines these towns as those with a moderate level of jobs and services, which **adequately cater for the people of its service catchment with good transport links and capacity for continued commensurate growth**."*

[Our emphasis.]

Section 4.10 discusses Foreign Direct Investment (FDI):

*"Kildare has a proven track record as an outstanding area to establish and develop a multinational business. The new gains will come from **expansions of the existing base of foreign companies and new arrivals.** Kildare is already an established base location for global brands seeking guaranteed and unfettered access to the EU single market, the largest market globally with 500 million.*

*The Council has a solid corporate base with Kerry Foods, Intel, **Hewlett Packard**, Pfizer and Green Isle all based in Co. Kildare however it is **still committed to facilitating the County to be more attractive to further inward investors (FDI and indigenous) by working to ensure needs-based services and infrastructure around the County and a renewed focus on our skilled talent pool**."*

[Our emphasis.]

The Kildare County Development Plan 2023-2029 contains several polices regarding the County's economic development. These include:

*"RE O26 Continue to **support and develop the Self-Sustaining Growth Towns of** Newbridge and **Leixlip as an attractor but not limited to Biotechnology, ICT, professional services, High-tech manufacturing and research employment**. Kildare County Council will work with Irish Water and other agencies to ensure the delivery of key infrastructure to facilitate future development."*

*"RE O30 Co-ordinate the delivery of strategic infrastructure including **pedestrian and cycle linkages within Leixlip and between Leixlip and the Greenway, Intel, Celbridge** and Lucan in a manner which supports future development and population growth."*

"RE O54 ***Support existing FDI large industrial companies in sustaining and expanding their businesses at appropriate locations****"*

[Our emphasis.]

The Kildare County Development Plan 2017-2023 states that it is an Objective (RE014) to:

"Work with EirGrid and ESB Networks to support the provision of a resilient electricity supply and distribution system ***to accommodate the future economic growth of the county and to facilitate the transition of heat and transport from fossil fuels to electricity****."*

[Our emphasis.]

Refer to the TPA Planning Report submitted with the Planning Application for a more detailed outline of applicable policies and objectives.

Leixlip LAP (extended to 2026)

The Leixlip LAP came into effect on 5th February 2020 and sets out an overall strategy for the proper planning and sustainable development of Leixlip in the context of the Kildare County Development Plan 2017-2023 (now the 2023-2029 Plan).

The LAP includes the subject site and the wider Liffey Business Campus. The LAP includes numerous broad policy objectives of relevance in regard to the subject site and the wider environs with the following of particular relevance:

"Policy S3 To promote, support and enable sustainable economic development and employment generation in Leixlip consistent with its role in the hierarchy of employment set out in the Kildare County Development Plan 2017-2023 and optimising its strategic location along a key public transport corridor as identified in the Metropolitan Area Strategic Plan".

Support for employment generating uses on land zoned within the Campus is strongly promoted by the County Development Plan and subsequently the LAP.

Section 6.2.1 of the LAP relates to the 'Supporting Employment Growth' within the plan area and has identified that the Kildare innovation Campus (the subject campus) is currently underutilised with a significant level of vacancy.

The Plan notes that:

"given the size and scale of the ***former HP campus it is an objective of the Council to work with local and national agencies to ensure the site can be redeveloped in an appropriate manner and remain a key employment hub for Leixlip and the Dublin Metropolitan Area****".*

[Our emphasis.]

Section 8.3 of the LAP relates to 'Road and Street Network'. The LAP identifies the opportunity to create enhanced connectivity in the vicinity of the LBC and includes the following relevant policy objective:

> *"Policy MT3.12 To investigate the feasibility of a new link road from the Celbridge Road (R404) to the south of the M4 connecting to the M4 Leixlip/Celbridge Interchange in consultation with TII, NTA and other stakeholders."*

The proposed development has been designed with a public link road along the northern side of the site in direct response to this policy objective. The new link road will enable public access from Celbridge Road in the east to the M4 Leixlip/Celbridge Interchange in the west, significantly reducing trip times and potential traffic congestion in the surrounding area. The new link road will be delivered in phase 1 of the development and will be a significant public benefit.

The LAP identifies the historical link between Castletown House and the Wonderful Barn. In this regard the LAP includes the following policy objectives and Actions to enhance the connection between the both:

> ***"Policy EDT3.8** To support development of linkages between historical demesne lands within and around the town to promote amenity linkage."*
>
> *Actions*
>
> - *To liaise with relevant landowners and stakeholders to investigate the potential for linkages between the historical demesnes within Leixlip and surrounding area.*
>
> ***Policy MT1.11** To support the delivery of a pedestrian and cycle overpass of the M4 to link The Wonderful Barn at Leixlip to Castletown Demesne in Celbridge in consultation with Transport Infrastructure Ireland (TII)."*

In this regard the proposed development has been appropriately designed to take account of the LAP's aspirations as well as enabling future connection to Castletown Demesne.

[Our emphasis.]

Meath County Development Plan 2021-2027

The EirGrid uprating outlined as forming part of the facilitation works will in part include existing overhead lines that connect back to the Kinnegad and Dunfirth Substations in County Meath. The MCC Development Plan recognises the importance of the electricity network in supporting high-end enterprise and notes at Section 6.15.4.1 of the CDP that:

> *"**the strengthening of the national grid is important for a number of reasons including improving security of supply for** the domestic, residential and **enterprise***

> ***market aswell as attracting high end enterprise*** *which often require significant energy capacity and reliability."*
>
> [Our emphasis.]

Offaly County Development Plan 2021-2027

The EirGrid uprating outlined as forming part of the facilitation works will in part include existing overhead lines that connect back to the Derryiron Substation in County Offaly. The OCC Development Plan recognises the importance of an improved electricity network and notes at Section 3.3.1 of the CDP that:

> *"**The Council recognises that essential future upgrades are required to the electricity grid** in the midlands as outlined in Eirgrids Tomorrow's Energy Scenarios 2019 System Needs Assessment **and will support Eirgrid in future Programmes identifying grid solutions, in both infrastructural and technological terms**, in order to facilitate the electricity targets, set out in the Government's Climate Action Plan 2019 and the National Energy and Climate Plan 2021-2030."*
>
> [Our emphasis.]

Government Strategy on the Role of Data Centres in Ireland's Enterprise Strategy" (July 2022)

The statement, prepared by the Department of Business, Enterprise and Innovation outlines the role data centres play in Ireland's ambition to be a digital economy hot-spot in Europe. It states that:

> *Data centres directly contribute to job creation and they also generate significant added economic benefit by providing a range of services to other firms that undertake production, research and development, marketing, sales, service, and support activities in locations with no physical/geographic connection to the data centre.*

The document acknowledges that, as large consumers of electricity, data centres also pose particular challenges to the future planning and operation of a sustainable power system. The Government recognises these challenges and will take steps to mitigate them through a plan-led approach.

3.2.2 Development Proposals Alignment with the relevant Objectives and Polices

As set out in the Planning Report prepared by TPA, it is considered that the proposed development for which consent is being sought accords with the land zoning objectives and vison for the lands as set out within the Kildare County development Plan and Leixlip Local Area Plan. Relevant Objectives and Policies are set out in individual Chapters of this EIAR.

3.3 Projects for Cumulative Assessment

Cumulative effects consider the impacts of other undeveloped permitted or planned projects within the vicinity and context of the project. This will include other projects planned by the developer, and any known permitted or planned projects by third parties. The following section details the process followed to identify those plans or projects with the potential to result in significant cumulative effects when considered in combination with the proposed Project.

The cumulative impact of the planned projects on site, the project and the potential future development of the surrounding environment has been considered in Chapter 18 (Interactions & Cumulative Impact), to the extent possible having regard to the nature of the relevant plans and projects.

TPA have used Geographic Information System (GIS) planning application data to obtain a list of all projects within 5 km[1] of the site that have been granted planning permission in the last 10 years[2] and which either are unbuilt and have extant permission or are under construction. The list has been filtered down to exclude minor projects[3] that are unlikely to interact with the Project to any level of significance. The final list provided to each consultant is included as Appendix 1.1.

The intent of including the appendix is to provide the Planning Authority with context by outlining the relevant existing or permitted plans or planned projects that could give rise to likely cumulative effects in combination with the project. As per the EPA guidance, a principal purpose of cumulative assessment is to consider whether minor effects of projects can cumulate to significance. The guidance states the following:

> *Cumulative Effects: The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects. While a single activity may itself result in a minor impact, it may, when combined with other impacts (minor or insignificant), result in a cumulative impact that is collectively significant. For example, effects on traffic due to an individual industrial project may be acceptable; however, it may be necessary to assess the cumulative effects taking account of traffic generated by other permitted or planned projects*

Appendix 1.1 has been used in the consideration of cumulative effects of the project and the planned / approved land uses in the vicinity of the site. The following 5 no. related projects have been identified to be the most likely to act in cumulation with the project and to be considered as part of the cumulative assessment:

1. Permitted development of 4 No. substations at the Kildare Innovation Campus.

[1] The chosen radius of 5km was considered to be a conservative estimate of the area within which other permitted or planned projects could potentially result in cumulative effects, given the nature and scale of the proposed development.
[2] Standard planning permission is valid for a period of 5 years. Applicants may seek a 10-year permission or may extend the life of a standard permission up to 10 years.
[3] Planning applications for minor alterations or extensions to existing private dwellings.

2. Permitted redesign of the Barnhall Rugby Club entrance.
3. Planned regeneration of the Wonderful Barn lands by Kildare County Council.
4. Proposed Glenveagh development at Celbridge East. (Kildare Planning Ref. 23/513)
5. Potential Future District Heating Network

These projects have been considered within the assessment of each environmental factor's cumulative impacts along with those projects identified in Appendix 1.1.

Development of 4 No. substations at the Kildare Innovation Campus

The developer received permission (Reg. Ref. 22/1096) for development of 4 No. 20 kV ESB double substations at four sites of c. 591 sq m in total (Site 1, c. 138 sqm adjacent to Building 4; Site 2, c. 138 sq m adjacent to Building 2 and Building 5; Site 3, c. 138 sq m adjacent to Building 5; and Site 4, c. 177 sq m partially within Building 9) at the Kildare Innovation Campus (principal works site).

The development will consist of: the construction of 3 No. standalone ESB double substations and associated LV switch rooms (Substations No. 1-3) of c. 3 m in height, c. 4.8 m in depth, and c. 17.8 m in width, with an individual gross floor area of 57.5 sq m; and all associated works above and below ground.

Substation No. 4 (gross floor area of 57.5 sq m) will include: internal alterations to the existing Campus Building No. 9; associated LV switch rooms; the removal of existing louvre and replacement with substation access doors on the southeast elevation; access path; and all associated works above and below ground.

The cumulative gross floor area of the development will be 230 sq m. The development of the four number substations is required for the existing campus buildings regardless of the project subject to this EIAR and is in the early stages of progressing post planning permission being granted.

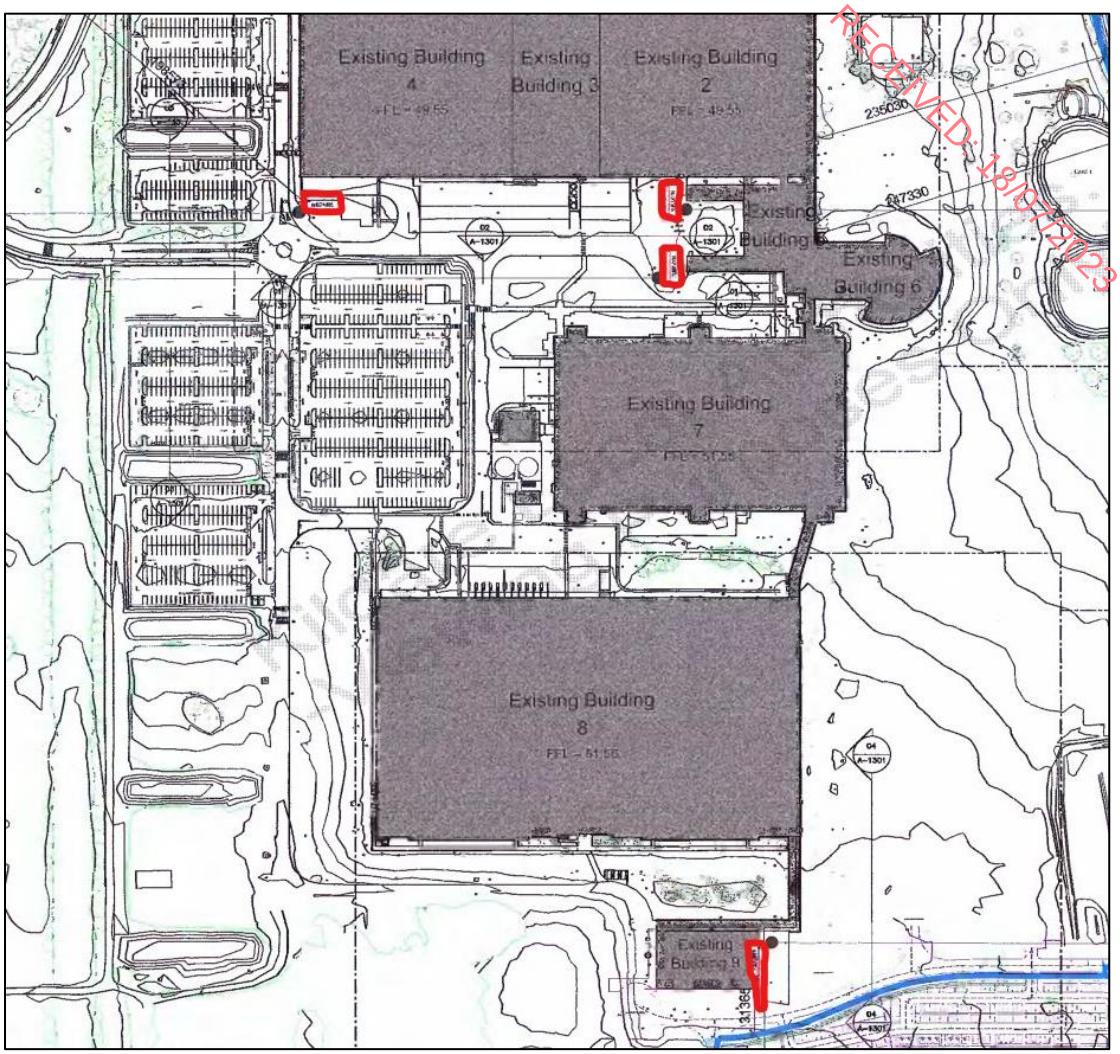


Figure 3.5: 4 No. 20 kV substations Site Layout Plan. (Source: RKD.)

We note that Building 9 is proposed to be demolished in the Project associated with this EIAR, which would house permitted substation No. 4 described above. Consequently substation no. 4 would no longer be required after that time as it was intended to serve buildings 7, 8 and 9. The other substations would remain as proposed within Reg. Ref. 22/1096 as they are required for Buildings No.1-6. No significant impacts are likely to arise between this and the subject project as the suitability of the permitted substations has already been assessed.

Redesign of the Barnhall Rugby Club entrance

Barnhall Rugby Football Club received permission (Red. Ref. 21/730) for development of the construction of a new vehicle access to the rugby club inclusive of associated pedestrian footpaths; modification to the rugby club's existing vehicle access to replace it with a shared pedestrian and cycle access and the provision of a raised pedestrian/cycle crossing on Barnhall Road; the expansion of the existing car park for the rugby club to accommodate 38 No. surface car parking spaces as well as hard and soft landscaping and all ancillary works including boundary treatments, site excavation and development works above and below ground.

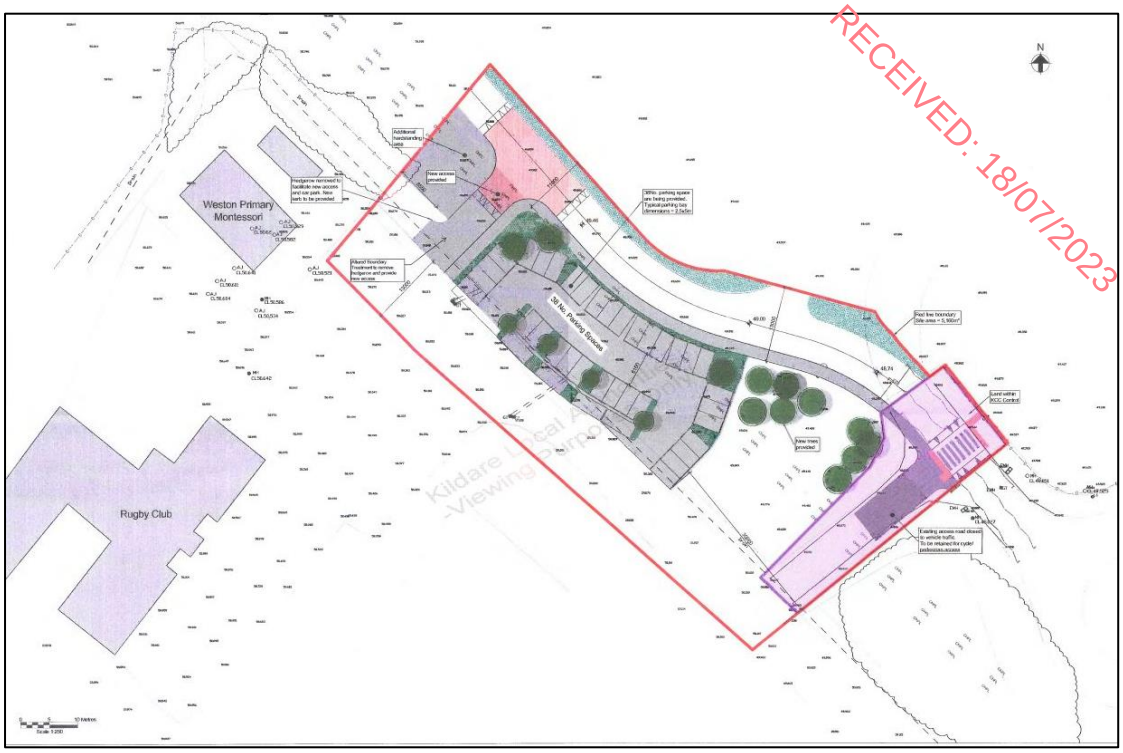


Figure 3.6: Barnhall Rugby Club entrance Site Layout Plan. (Source: ARUP.)

That proposal has been incorporated into the design of the subject project where the red lines overlap. Interactions between both projects are not likely to result in significant impacts.

Regeneration of the Wonderful Barn lands by Kildare County Council

The regeneration of the Wonderful Barn lands by Kildare County Council is a reasonably foreseeable project that may have cumulative effects in combination with the project associated with this EIAR.

It is at an early stage in the design process with preliminary design options being considered.

Figure 3.7: Wonderful Barn lands redesign option 1. (Source: Aecom.)

Figure 3.8: Wonderful Barn lands redesign option 2. (Source: Aecom.)

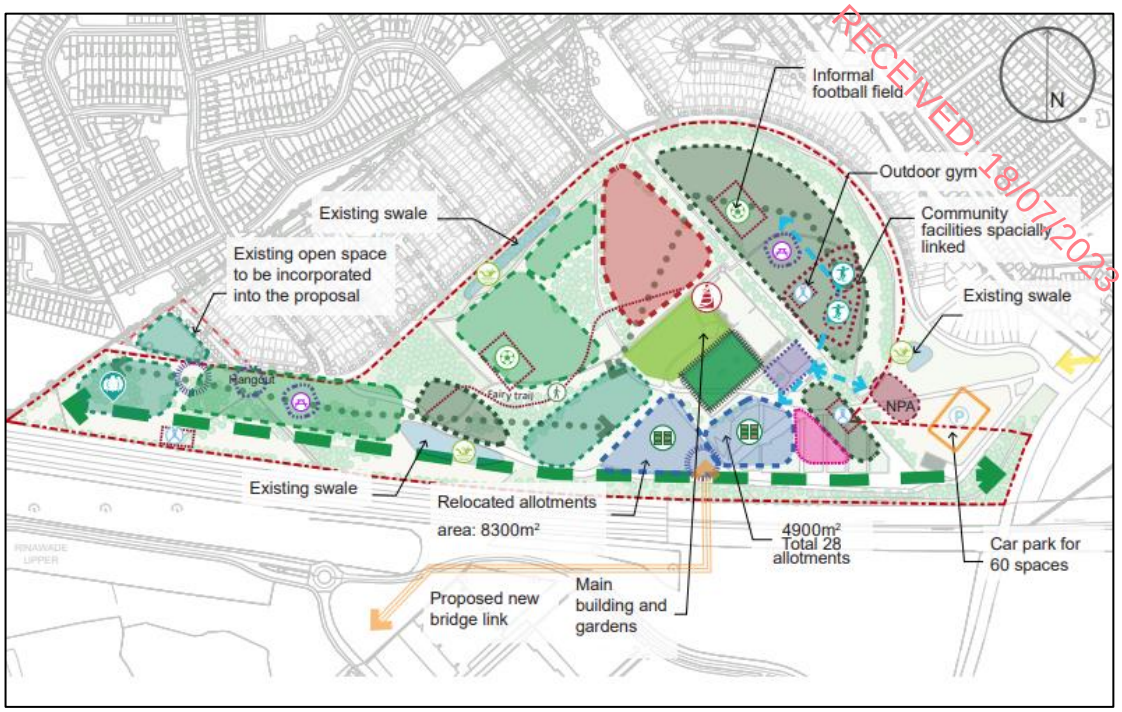


Figure 3.9: Wonderful Barn lands redesign option 3. (Source: Aecom.)

This project is likely to interact with the project as it relates to lands which are connected to the pedestrian and cyclist link over the M4 motorway to the north of the principal site.

The KCC public consultation homepage, which includes preliminary design reports, can be found at the following link:

https://kildarecoco.ie/AllServices/Planning/PublicRealm/TheWonderfulBarn/

That project and the subject project are likely to interact positively with the M4 overpass link bridge identified in all 3 options above (and within the Leixlip LAP), likely resulting in an overall significant positive impact on the connectivity and amenities of the area. The Wonderful Barn project in combination with the M4 overpass will contribute to the creation of a network of open spaces in the area by facilitating future connectivity to the Castletown Estate.

Glenveagh Development at Celbridge Road East KDA

The Celbridge East KDA is located diagonally north-east of the Kildare Innovation Campus and opposite the entrance to the Barnhall Meadows estate and the commencement of the pedestrian pathway and cycleway as proposed as part of this project.

The Leixlip LAP has identified the Celbridge Road East KDA as including *'New Residential/Open Space and Amenity lands connecting Leixlip Demesne and Main Street located to the east of Celbridge Road'*. Furthermore, the LAP notes *'This KDA measures approximately 12.8ha in area and provides for 8ha of 'Residential' zoned lands alongside a new community park and amenity walk'.*

The KIC masterplan has been designed to be cognisant to the future development of the Celbridge KDA lands and provides opportunity for future pedestrian, cycling and district heating connections.

A planning application has recently been submitted to KCC for the development of these lands and has been included in the cumulative assessment set out within this EIAR (Kildare County Council Planning Reg. Ref: 23/513). A decision on the application is due on 8th August 2023.

If permitted there is potential for positive interactions with the KIC proposed development through the provision of energy efficient district heating and connectivity to promote active travel among future residents of the area.

Future District Heating Network

Whilst the proposed project is not dependent on the future development of a district heating network beyond KIC, it will facilitate its future development by providing for the in-ground infrastructure within the campus lands up to the boundary or in close proximity to the Celbridge East KDA lands, Castletown Estate. Future projects in the area that wish to avail of district heating will therefore benefit from the proposed development, the cumulative effect of which will be more efficient, cost effective and environmentally friendly heating solutions in future local developments.

4.0 EXAMINATION OF ALTERNATIVES

4.1 Introduction

This chapter of the *Environmental Impact Assessment Report* was prepared by Gavin Lawlor and Brian Minogue of Tom Phillips & Associates and examines the alternative development options that were considered for the subject site during the design development process.

Gavin Lawlor is a Director of Tom Phillips + Associates. He holds a BA (Social Science) from University College Dublin, where he graduated in 1995 with a Masters in Regional and Urban Planning (MRUP) Degree and is a Full Member of the Irish Planning Institute (IPI) with 25 years' experience. Brian Minogue is a Member of the Irish Planning Institute and has been practicing as a town planner for over 15 years. Brian holds an undergraduate degree in Spatial Planning (Hons), (2007) DIT.

The requirement to consider alternatives within an EIAR is set out in Annex IV (2) of the EIA Directive (2014/52/EU) and in Schedule 6(1)(d) of the *Regulations,* which require the following information to be included:

> "*A description of the **reasonable alternatives** studied by the person or persons who prepared the EIAR, which are relevant to the proposed development and its specific characteristics and an indication of the main reasons for the options chosen, taking into account the effects of the proposed development on the environment*".
>
> [Our emphasis.]

Reasonable alternatives may relate to project design, technology, location, size and scale which were studied in the preparation of the EIAR relevant to the proposed development and its particular characteristics, together with an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects.

The EU Commission guidance *Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report* (EU Commission, 2017) considers that for alternatives to be reasonable they must be *"…able to accomplish the objectives of the Project in a satisfactory manner, and should also be feasible in terms of technical, economic, political and other relevant criteria."*[1] The guidance then goes on to set out some key reasons why an alternative may not be considered reasonable:

- *There are technological obstacles: high costs of a required technology may prevent it from being considered to be a viable option, or the lack of technological development may preclude certain options from consideration;*
- *There are budget obstacles: adequate resources are required to implement Project Alternatives;*
- *There are stakeholder obstacles: stakeholders opposed to a Project Alternative may make a particular option unattractive;*

[1] *Environmental Impact Assessment of Projects – Guidance on the Preparation of the Environmental Impact Assessment Report* (EU Commission, 2017) at page 52

- *There are legal or regulatory obstacles: regulatory instruments may be in place that limit/prohibit the development of a specific Alternative.*[2]

The *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment* of August 2018 provide further guidance on this matter as follows:

> "*The types of alternatives will depend on the nature of the project proposed and the characteristics of the receiving environment. For example, some projects may be site specific so the consideration of alternative sites may not be relevant. It is generally sufficient for the developer to provide a broad description of each main alternative studied and the key environmental issues associated with each. A 'mini-EIA' is not required for each alternative studied*".

The *EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)* of March 2020 provide further guidance on this matter as follows:

> *"The presentation and consideration of the various **reasonable alternatives** investigated by the developer is an important requirement of the EIA process".*

Thus, the consideration and presentation of the reasonable alternatives studied by the project design team is an important requirement of the EIA process.

4.2 Rationale for the Proposed Development

The primary rationale for the proposed development is to provide for the redevelopment/regeneration of an underutilised business and innovation campus to encourage Foreign Direct Investment and maximise economic value in line with the landowners area of expertise in ICT and Deep Tech Innovation. This is fully supported in national, regional and local planning policy. In this regard, the *National Planning Framework 2040 - Our Plan (2018)*, classifies County Kildare as being in the 'Mid-East' and it states within that region that there must be:

> *"a greater focus on addressing employment creation, local infrastructure needs".*

A number of the National Policy Objectives relate to employment development. These include, inter alia:

National Policy Objective 10b:

> *"Regional and Local Authorities to identify and quantify locations for strategic employment development, where suitable, in urban and rural areas generally."*

National Policy Objective 11:

> *"In meeting urban development requirements, there will be a presumption in favour of development that can encourage more people and generate more jobs and activity*

[2] *Ibid.*

> *within existing cities, towns and villages, subject to development meeting appropriate planning standards and achieving targeted growth."*

The aims and objectives of the NPF with regard to the Eastern and Midland region are clear in their focus on the importance of sustainable employment provision.

Furthermore, identification of Leixlip with a lower ratio of jobs:resident workers provide overarching support for the generation of employment within the Leixlip area. In that regard, the development proposed will further develop an existing business campus, that is zoned for development and currently underutilised. This will further enhance the provision of employment in a location that is already the focus of similar employment generating uses.

The subject land is zoned and well serviced, ensuring positive compliance with the overarching themes of the NPF.

The Strategic Vision of the Regional Spatial & Economic Strategy (RSES) for the Eastern and Midland Region is:

> *"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."*

County Kildare falls under the sub-catchment of "Eastern Region" and the strategic catchment area surrounding Dublin known as the "Core Region":

> *"The Core Region contains a strong network of county and market towns that have a good level of local employment, services and amenities, which serve not just their resident populations but a wider catchment area."*

Section 4.2 of the RSES lists the subject site within the Metropolitan area of Dublin, the vision statement of which is to:

> *"build on our strengths to become a smart, climate resilient and global city region, expanding access to social and economic opportunities and improved housing choice, travel options and quality of life for people who live, work, study in or visit the metropolitan area."*

Table 5.1 specifically mentions the subject site (former Hewlett Packard Site) as a strategic development area to "strengthen employment base for North Kildare".

The role of Leixlip in terms of strategic employment development is noted in Table 5.2 of the RSES 2019-2031. It identifies the employment lands in Leixlip and their potential as follows:

> *"Large scale former **Hewlett Packard site** and Collinstown site for **regional enterprise to strengthen employment base for North Kildare**."*

[Our emphasis.]

Specific to Kildare and the Hewlett Packard site, section 4.10 of the Kildare County Development Plan 2023-2029 discusses Foreign Direct Investment (FDI):

"Kildare has a proven track record as an outstanding area to establish and develop a multinational business. The new gains will come from ***expansions of the existing base of foreign companies and new arrivals.*** *Kildare is already an established base location for global brands seeking guaranteed and unfettered access to the EU single market, the largest market globally with 500 million.*

The Council has a solid corporate base with Kerry Foods, Intel, ***Hewlett Packard****, Pfizer and Green Isle all based in Co. Kildare however it is* ***still committed to facilitating the County to be more attractive to further inward investors (FDI and indigenous) by working to ensure needs-based services and infrastructure around the County and a renewed focus on our skilled talent pool****."*

[Our emphasis.]

Additional to encouraging Foreign Direct Investment, the development seeks to provide for a connected innovation hub for global leaders in science and technology and to connect those global leaders with third level institutions, in particular Maynooth University which offers graduates and a knowledge base to prospective employers in Kildare. Objective RE O20 of the Kildare County Development Plan 2023-2029 seeks the creation of:

"Further ***key linkages and partnerships with Maynooth University (MU)*** *including the branding of the area as a centre of excellence in the knowledge-based economy."*

[Our emphasis.]

The development further seeks to improve the physical connectivity of the site with the surrounding lands to improve mobility for sustainable modes of transport from Leixlip to Celbridge. The Leixlip Local Area Plan (LAP) states that:

*"****It is the policy of the Council to promote enhanced permeability for pedestrians and cyclists*** *within the urban environment in order to improve access to the town centre, local schools, recreational facilities, shops, public transport services and other amenities. This includes providing improved connectivity across the River Rye, Royal Canal and railway line, and* ***enhanced links with*** *Maynooth,* ***Celbridge*** *and Dublin."*

[Our emphasis.]

4.3 Alternatives Studied

EIA legislation and prevailing guidelines and best practice require that Environmental Impact Assessment Reports consider the following aspects for EIA projects with regard to their environmental effects;

- Do Nothing alternative;
- Alternative project locations;
- Alternative designs/layouts;
- Alternative processes;
- Alternative mitigation measures.

The reasonable alternatives studied during the development of the project comprise alternative site layouts and design solutions (as well as processes) for the redevelopment of the former HP lands to provide *inter alia* employment development on the site, in accordance with national, regional and local planning policy.

4.3.1 "Do-Nothing" Alternative

In the "Do-Nothing" scenario, the former HP lands would continue to operate as an innovation campus and the potential to maximise development opportunities for the site to provide for *inter alia* a strengthened employment base for North Kildare, in accordance with national, regional and local planning policy, would not be realised. The "Do-Noting" alternative would not meet the projects objective to provide for the redevelopment/regeneration of an underutilised business and innovation campus to encourage Foreign Direct Investment and employment generation in Ireland and Kildare, was not considered a reasonable alternative and was not therefore considered further. The impact of the Do-Nothing scenario has been considered in each chapter of the EIA Report.

4.3.2 Alternative Site Location

The developers are primarily property investors who invested in KIC for its existing portfolio of tenants and to improve and expand the potential of the site, encourage investment and the maximisation of the economic return.

Prior to the purchase of the site by the current landowners a wide variety of general environmental and economic criteria were considered, the key criteria for the location of the proposed development were;

- Availability of a high-quality telecommunications fibre network;
- Accessibility to the natural gas network (to provide dispatchable energy in line with government policy);
- Availability of a high-quality and existing electricity network (to provide direct connection to the national grid and mix of renewables);
- Availability of a suitably large site with suitable development zoning;
- A site in proximity to existing high density of US and global tech companies;
- Existing campus development with potential to expand with high-tech and ICT uses;
- Low natural disaster risk particularly in relation to flooding.

Given the project comprises the redevelopment of the former HP lands and an existing campus, which national, regional and local planning policy specifically promotes as being ripe for redevelopment, the further consideration of alternative locations for employment generating uses is not considered relevant in this instance.

The site has a history of redevelopment including when, in 1995, planning permission was granted for a semi-derelict meat packing facility to be redeveloped as an ink-cartridge manufacturing plant for Hewlett Packard.

That Hewlett Packard facility – which has been expanded over the years – has now itself become surplus to requirements and has received new tenants (HP Enterprise has retained some occupancy but no HP manufacturing activities are involved).

The site is not being used to its full potential and, according to *inter alia* the National Planning Framework, development should be prioritised on vacant or underutilised brownfield sites instead of on undeveloped greenfield sites that encourage sprawled development.

Furthermore, as the developer has purchased a site earmarked for redevelopment, there are no other alternatives sites that the developer can realistically consider.

4.3.3 Alternative Site Layout and Land Use

Prior to the purchase of the site by the existing landowner, the then project team commenced a master planning process, so that the future development of the campus could be delivered in an integrated manner. The master planning process has been one that has evolved over several years and one that has involved numerous meetings and discussions with relevant stakeholders including the local planning authority.

As noted in section 1.6, the Project Team has had strategic engagement with a number of stakeholders including Kildare County Council, IDA Ireland and Kildare Chamber of Commerce.

Over the last several years, various development options have been explored and environmental factors have been considered.

At the outset, the project architects undertook an extensive site appraisal, which was aimed at determining the appropriate scale, mass and layout of this scheme.

The initial analysis included an assessment of:

- Existing Buildings: 9 No. Existing Linked Buildings ranging up to 21 m in height, containing manufacturing, office, distribution, welfare and utilities, c. 1,570 parking spaces and clad externally in a system of modular insulted metal panels and glazing.

- Site Access: Primary access via M4 Junction 6 and the R449 (Barnhall Road), secondary access via 2 No. entrances from the R404 (Celbridge Road), and existing security huts at entrances.

- Connections: Currently there is an access-controlled route through the site connecting the R449 Barnhall Road to the R404 Celbridge Road. The Leixlip LAP contains a stated objective to provide a future link road between the R449 and the R404. There is also an important visual connection through the site by way of a protected view corridor lined with trees giving views from Castletown House to the west and the Wonderful Barn to the north.

- Site Profile: Extensive frontage to the M4 and the Celbridge Rd provides potential public profile, but the boundaries are currently heavily planted and screened.

- Site Levels: Site is generally flat, however, there is a slight fall from northwest to east.

- Adjoining Lands/Uses: Castletown Demesne is to the West, separated by dense woodland. Barnhall Rugby Club is to the South including a small primary Montessori school. There is a small number of existing residences on the other side of Celbridge Rd. To the east of the site.

The proposed masterplan[3] for the site has been informed by national, regional and local planning policies, in particular the Leixlip LAP 2020-2023. A number of design options were thereafter developed for the site and are depicted below.

'2019 Plan'

The '2019 Plan' was developed by the previous landowner, with principally the same project team. The objectives of the landowner, at the time, sought to establish what uses would be acceptable for the site.

The over-riding issues identified during the design phase related to the uses proposed, particularly the need for 'employment generating uses', phasing and the provision of a roads objective and a pedestrian bridge required by the Leixlip LAP.

Design of the development progressed to provide 13 No. new buildings on site in addition to the existing buildings already on the campus. This included the DB Schenker logistics facility, which would later form a separate planning application.

The 2019 plan also provided for a road, which would run through the View Corridor from Castletown House in Celbridge. The 2019 plan primally consisted of 12 No. buildings in seven different typologies. All buildings were single storey with an overall maximum height of 16.9 m. The buildings were generally located around a proposed 'loop road', which circumnavigated the campus. The view corridor from Castletown House towards the Wonderful Barn was to be retained as is and a link road would be located west of the corridor of trees.

[3] The masterplan refers to all works subject to the application for consent, described on the public notices and included within the 'redline' boundary on the Site Layout Plan

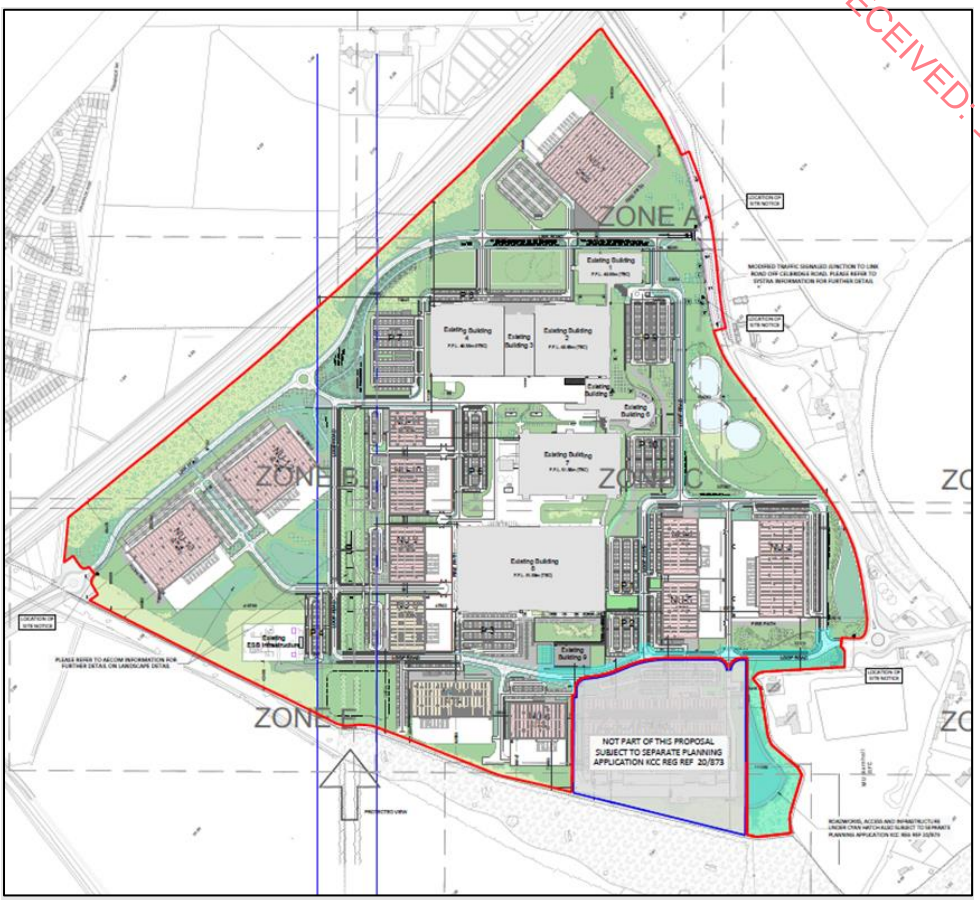


Figure 4.1: '2019 Masterplan'. (Source: RKD Architects.)

'2021 - 2023 Masterplan'

With the '2019 Masterplan' prepared (and indicatively submitted as part of the DB Schenker application (Reg. Ref. 20/873), the campus changed ownership; however, the principal project team was retained.

After further review by the new landowner, high end uses were established to align with the objectives of the LAP and to maximise the potential of the site, encourage investment and economic return, focusing on *inter alia* employment generating, deep tech, high-tech, ICT, and research-based uses.

The project design team under the direction of the landowner in conjunction with the project planning consultants (TPA) undertook a comprehensive assessment of the previously prepared 2019 masterplan and sitelayout to maximise its use in terms of both the spatial distribution of the various aspects within the site and the optimal use of the site area.

A number of iterations of site layouts were considered to arrive at the proposed arrangement of buildings, access and site infrastructure. The proposed layout was determined based on the following fundamentals;

- All buildings were to be set back from the M4 motorway and Celbridge Road to align with KCC requirements for building setbacks and maintain the general openness to the campus;

- All buildings to be set back from the designated view corridor to protect the amenity value of the visual link between Castletown Estate and the Wonderful Barn which comprise various national monument and protected structure designations (Refer to Chapter 15 of this EIAR). The visual link will be protected, formalised and enhanced under this application);
- Principal access to the site was to be via the existing Barnhall road entry which provides direct access to the M4. This entrance has been in use for over 20 years and is the most direct route to enter the site. Secondary access to be via the two access points onto Celbridge Road;
- New buildings and roof infrastructure to be no higher than the existing tallest building on site (Building No.7) and to be generally limited to c.18m so to not interfere with the existing historic tree line when viewed from Castletown Estate.
- The proposed energy centre to be located to ensure maximum mitigation of air and noise emissions to off-site receptors;
- The provision of a public access road to be taken in charge by KCC along the northern part of the site with site distribution off the principal public road.
- The location of the buildings at these various locations was considered preferential in terms of minimising the amount of excavation required across the site.

The previous 2019 scheme was reviewed with these principals in mind and a number of iterations were prepared.

Iteration No.1 - Life Science, Data Centre Uses with existing buildings retained

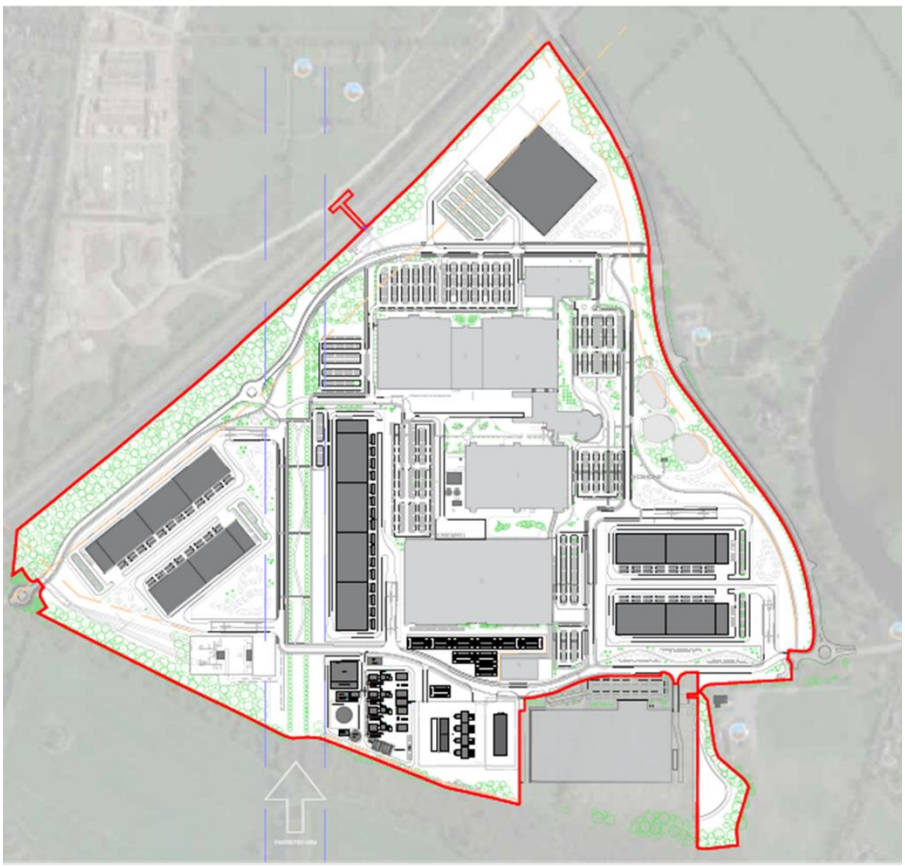


Figure 4.2: 2021-2023 masterplan Iteration No.1 (Source RKD Architects)

The initial iteration of the proposed masterplan included the retention of all existing buildings on site and conversion to life science and technology uses. One new life science building was proposed in the northern corner of the site. A pedestrian/cycle overpass of the M4 was introduced. 5no. New data centres were proposed as well as a new 220kV Substation, battery storage area and energy centre within the southern part of the campus. The proposed public road, site access and circulation remained principally unchanged.

This iteration of the masterplan proposed significant energy infrastructure along the southern boundary of the site. Upon initial review of this proposal, it was determined that it would be difficult to mitigate against the potential for noise impacts to surrounding land uses. In other respects, the potential environmental effects of this iteration would have been largely similar to the current proposal.

Iteration No.2 - Enhanced Life Science, Data Centre Uses with some existing buildings demolished

As part of the design process and further review of the existing vacant buildings on site (Building 7 & 8), it was determined that in achieving the long term vison for the campus buildings no. 7 & 8 would reach the end of their useful life expectancy and would require significant investment and upgrades to be maintained on site and repurposed. As such it was determined that the demolition of Buildings 7, 8 & 9 (energy centre for Buildings 7 & 8) should be demolished in the life of the masterplan. This change created additional space for distribution of proposed uses on site. The iteration also introduced a replacement 110kV Substation adjacent to the existing 110kV Rinawade Substation as the existing substation on site was determined as being close to reaching end of life. A new life science building was proposed in proximity to the Celbridge Road interface and the data centre buildings were re-orientated. All other site infrastructure was generally retained as per the previous iteration with the exception of the internal road network which was altered slightly.

The potential environmental effects of the second iteration of the proposal would have been largely similar to the current project given a similar mix of uses and layouts were included. One specific area of concern, related to the impact on protected view lines of the wonderful Barn, particularly owing to the proposed C3 building. This potential effect was deemed to be significant and this iteration of the masterplan was ruled out.

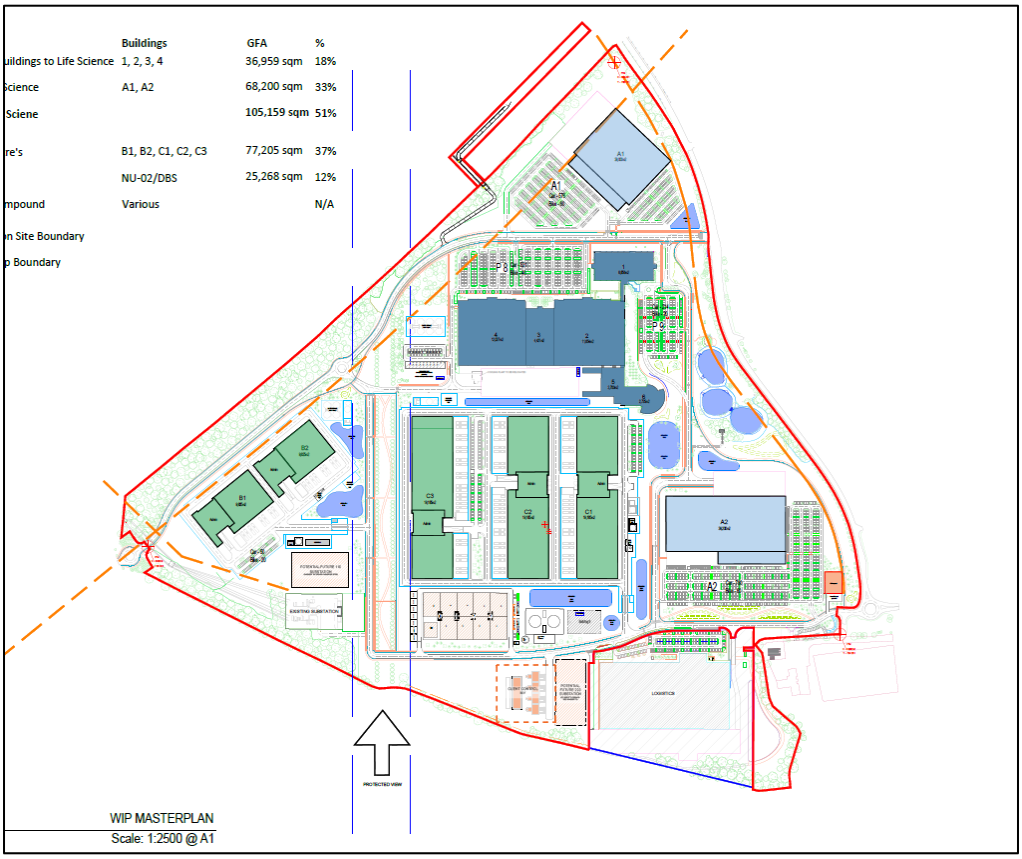


Figure 4.3: 2021-2023 masterplan Iteration No.2 (Source RKD Architects)

Iteration No.3 - Revised Energy Centre location, Substation Requirements and Building Orientation

The Energy Centre, located plan south of the 'C' Buildings in Figure 4.3, was altered to be relocated plan north of the 'C' buildings as seen in Figure 4.4. The location of the energy centre to the centre of the site was considered favourable as it located the energy centre further away from noise sensitive receptors. An acoustic perimeter screen wall was also introduced to provide suitable mitigation.

The configurations of the data centres themselves were also altered to provide greater setback from the protected view corridor and also to meet the relevant design criteria of the data centre end user. Further to this, the end use for the A – Buildings was confirmed by the landowner to be Deep Tech focused rather than Life Sciences. The change of land use is considered to better align with the overall vision for the KIC as it allows for high technology and innovation uses rather than traditional life sciences. The variation required minimal change to the building footprints.

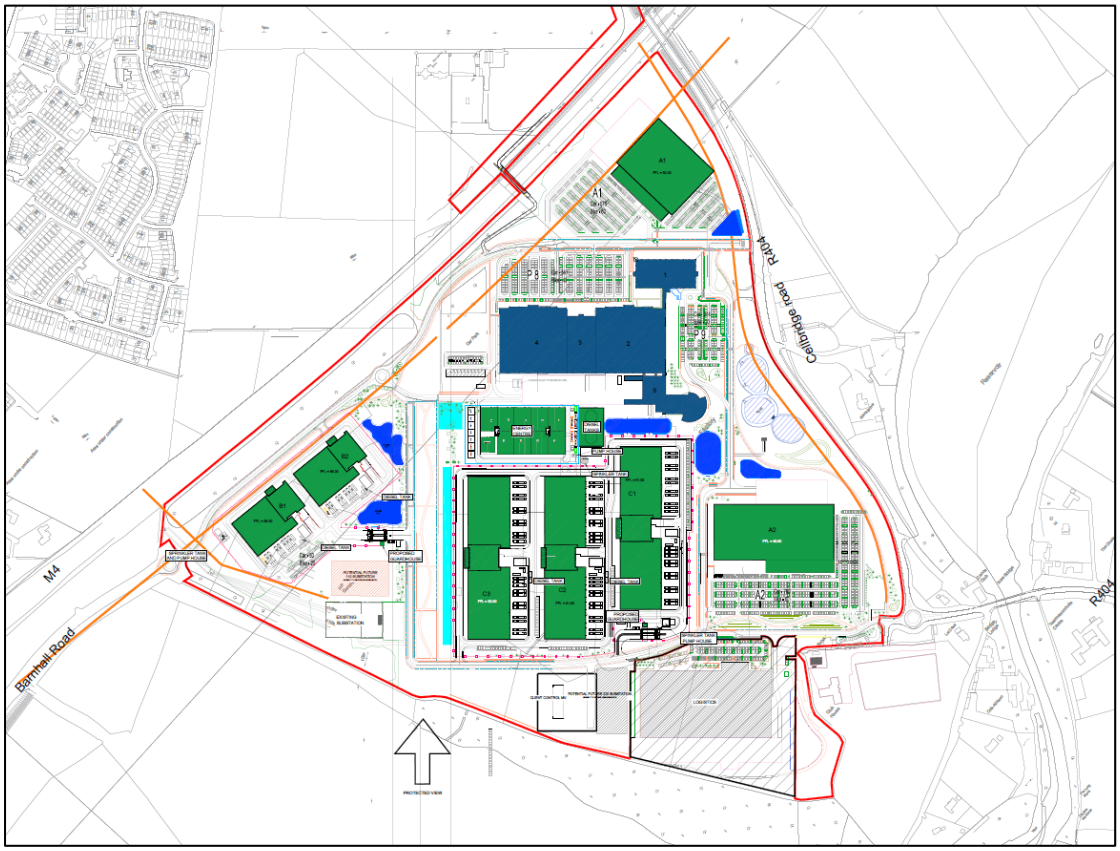


Figure 4.4: 2021-2023 masterplan Iteration No.3 (Source RKD Architects)

The design layout was further altered (Figure 4.5) to reconfigure Building A2 to be positioned fully along the internal loop road and to be positioned further away from Celbridge Road so to provide a more appropriate design response to the campus entry.

Around the same time, the previously proposed 220 kV substation, plan south of the 'C' buildings, was omitted as it became clear that the proposed replacement 110kV substation adjacent to the existing Rinawade substation would have the capability, along with future uprating of EirGrid infrastructure and new gas mains to the site (the facilitation works), to provide sufficient power from the grid and fuel inputs to service the full development. No new grid connections would be required to facilitate the development, rather uprating and

reinforcement of the existing infrastructure would provide sufficient power supply to the campus. As such the 220kV Substation was removed from the masterplan (Refer to TNEI and H&MV Reports – separately circulated and Planning Report by Tom Phillips + Associates).

Iteration No.4- Merging of B Buildings and improvements to tree retention

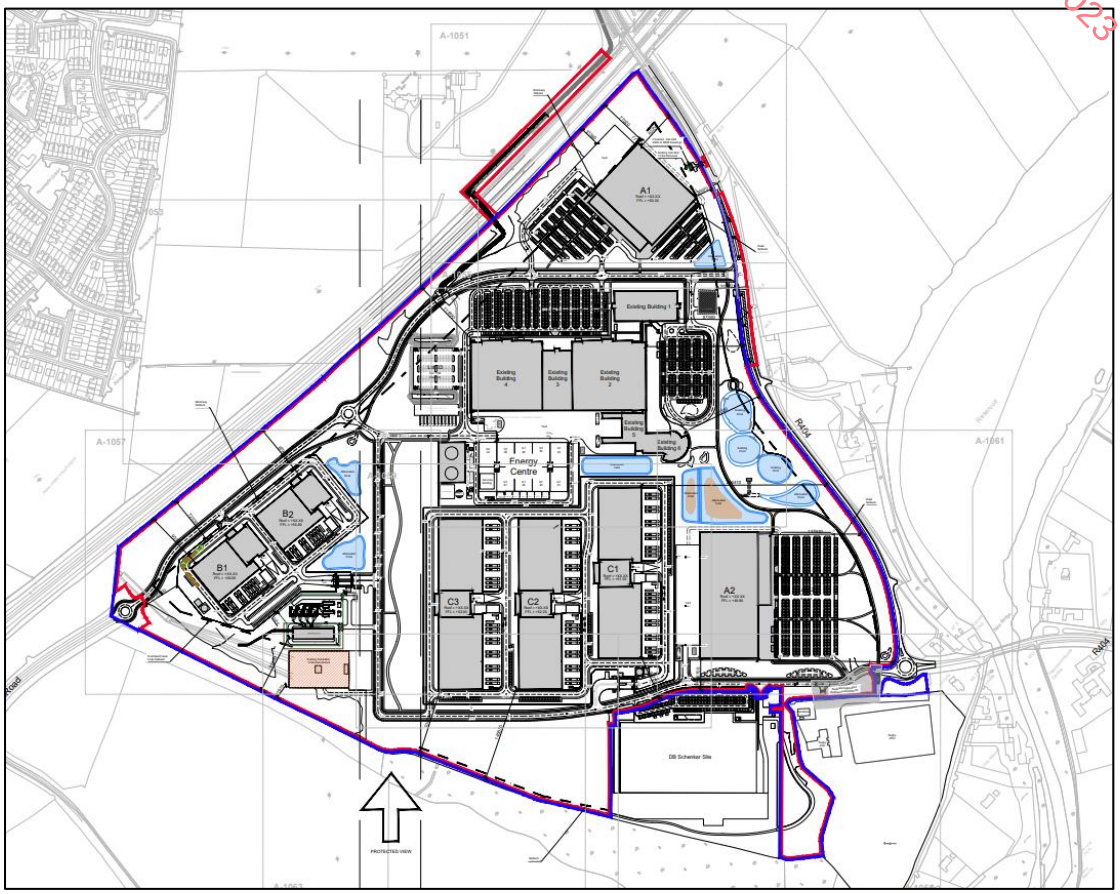


Figure 4.5: 2021-2023 Masterplan Iteration No.4 (Source RKD Architects)

The last significant alteration to the masterplan came with the merging of buildings B1 and B2 into one single building as a result of the revised approach to grid connection and ability to consolidate to B Buildings. This layout was also modified where possible in order to preserve trees assessed as being of 'Moderate' to 'High' ecological value which has resulted in the retention of 8 no. trees, including 4 no. Oak, 2 no. Lime, 1 no. Beech and 1 no. Sycamore the majority being located in proximity to the proposed B Building and adjacent to the proposed main carpark along Celbridge Road. This layout is as per the final submitted proposal.

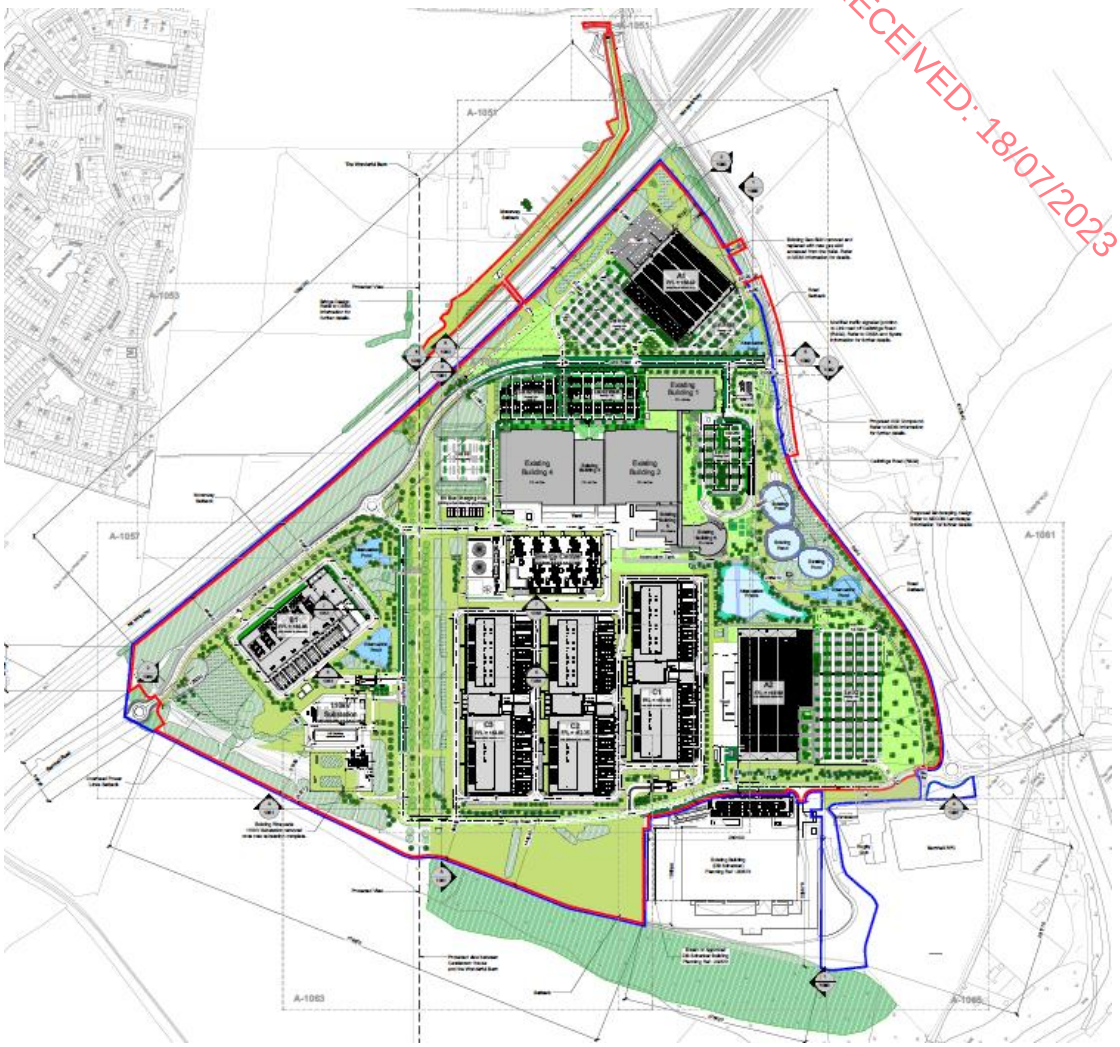


Figure 4.6: Final Site Layout Plan (Masterplan). (Source: RKD Architects.)

Overall, the environmental impacts of the proposed layout and design are considered to be similar in nature to the '2019 Masterplan' and subsequent iterations identified above, with similar amounts of excavation and similar construction activities proposed, as well as similar building scales, heights and overall similar visual impact on the surroundings.

Regarding land uses, the level of employment generation is also considered to be similar to the '2019 Masterplan' and subsequent iterations, with c. 2,000 additional jobs estimated to be created.

Whilst the mix of ICT /data centre and Deep Tech uses have different environmental impacts to the '2019 Masterplan' such as increased power demands and associated emissions, the proposed uses also have reduced direct impacts from traffic generation compared to the previous logistics/warehouse focused scheme. The energy centre associated with the current project is located internally within the campus and so does not present the same issues as the first iteration of the masterplan in terms of noise impacts to surrounding lands. In addition, the current proposal has been designed to minimise visual impact through protection of key historic views through the site.

The final site layout was brought forward as the preferred layout for a number of reasons, as outlined in the previous sections, due to it having the least environmental impact from a noise, air and visual perspective.

Table 4.1 – Comparison matrix of environmental considerations on various iterations of the proposal

	Traffic Generation	Accessibility	Potential Impact (Energy Centre location)	Heritage (Views to Wonderful Barn)	Infrastructure upgrades (Requirement for 220 KV substation)	Ecology (Protection of existing mature trees)
2019 Masterplan						
Iteration 1						
Iteration 2						
Iteration 3						
Iteration 4 (Current)						

Less Favourable	
More Favourable	

4.3.4 Alternative Designs

In addition to the above iterative process for site layout design, alternative building designs were considered by the project team through the evolution of the masterplan. These building designs are identified in figures 4.8 - 4.10 below.

Figure 4.8: '2019 Masterplan'. (Source: RKD Architects.)

Figure 4.7: Facade Design Iteration No. 1

Figure 4.8: Facade Design Iteration No. 2

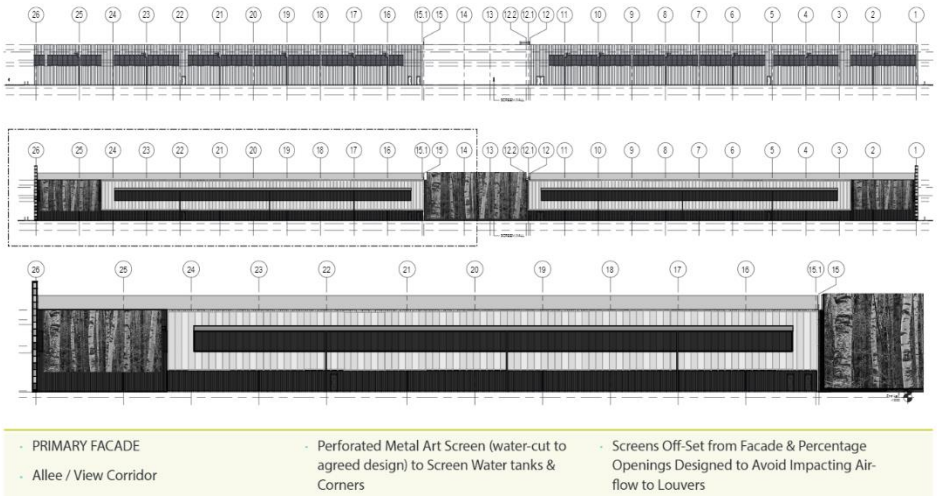


Figure 4.9: Facade Design Iteration No. 3

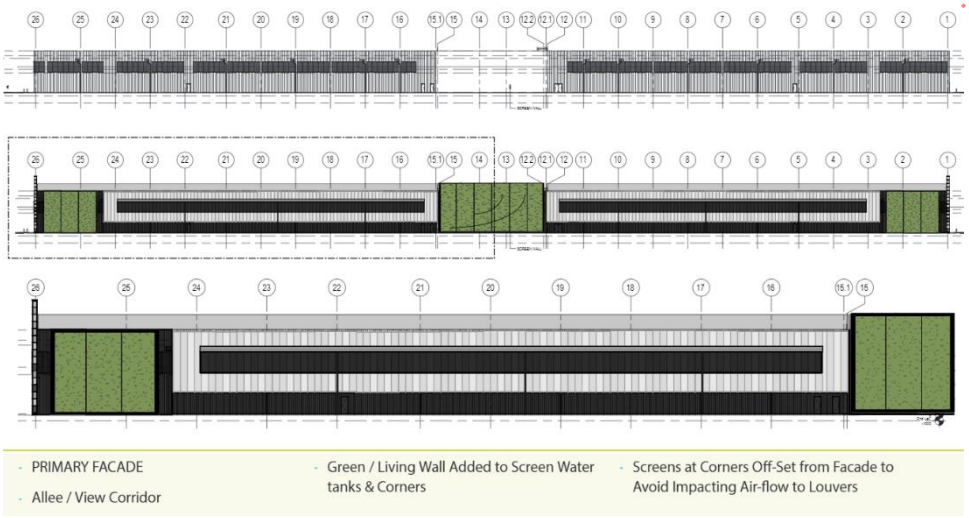


Figure 4.10: Facade Design Final

The final building designs were advanced by the design team for a number of reasons including being considered the most visually sensitive to the new public road as well as the protected view corridor that traverses the campus. In addition, the siting and location of the energy compound required reconsideration due to potential for noise related impacts.

In addition to main building facade designs, alternative options for screening of the energy centre were reviewed, with the final perimeter screen including green walls advanced as it represented an environmentally conscious design and was reflective of the wider sustainability principles for the campus.

Alternative designs were reviewed for the proposed energy compound. Initial iterations included a screening structure with cladded exterior. The final design advanced by the design team incorporates elements of green vegetation walls as a more visually sensitive design response as well as one which aligns with the wider sustainability principles of the campus.

4.3.5 Alternative Processes

The primary processes of significance that the proposed development will comprise are:

Data Centre Operation/Technologies

The future data centre operator is committed to continually assessing and improving the technology used, particularly with respect to minimising power and water consumption, in accordance with the goals of Irelands Framework for Sustainable Development *'Our Sustainable Future' DOELG 2012.*

The future data centre operator is a signatory of the Climate Neutral Data Centre Pact. The Pact was launched in January 2021. The associations and companies (in excess of 100) that form part of the pact are committed to ensuring the design and operation of data centres across Europe meet ambitious sustainability criteria. The Pact establishes a Self-Regulatory initiative which has been developed in cooperation with the European Commission. The Pact also supports the European Green Deal, which has the aim of making Europe the world's first climate neutral continent by 2050.

The Climate Neutral Data Centre Pact sets goals that will facilitate Europe's essential transition to a greener economy. It commits signatories to ensuring their data centres are climate neutral by setting ambitious measurable targets for 2025 and 2030 within the following areas:

- Proving energy efficiency with measurable targets
- Purchasing 100% carbon-free energy
- Prioritise water conservation
- Reuse and repair servers
- Investigate opportunities to recycle heat

The data centre operator's designs are constantly evolving, and hardware is chosen with energy efficiency key to decision making. The Energy & Sustainability Statement, prepared by Ethos and submitted with the application sets out the chosen design and its sustainability principles.

Hardware

The data centres require specific hardware to fulfil their purpose as centralised computer sever systems on a large scale. The proposed development will employ data server technology used by the prospective operator at their other facilities in Ireland and around the world and will represent state-of-the-art technology as set out in the Energy and Sustainability Statement prepared by Ethos and submitted with the application. Alternative technologies will be considered on an ongoing basis and as new advances are made in attempt to improve *inter alia* reliability, energy efficiency and environmental impact.

Cooling Systems

The data storage rooms need to be supplied with fresh air to maintain optimum environmental conditions. The proposal cooling system is state-of-the-art and is being implemented to comply with European standards for high energy efficiency of data centres (refer to the Energy and Sustainability Statement prepared by Ethos). Alternative technologies are considered on an ongoing basis in attempt to improve *inter alia* reliability and environmental impact.

Deep Tech Operation/Technologies

The ultimate Deep Tech end users are not yet known; however the proposed building design has been advanced based on best practice standards as set out in the Energy and Sustainability Statement prepared by Ethos. Alternative technologies will be considered on an ongoing basis in attempt to improve *inter alia* reliability and environmental impact.

Power Supply

The proposed development requires power to operate. Below are the options/alternatives that have been explored:

Island mode

The landowner explored the option of operating the data centre portion of the development as an electrical island with no connection to the EirGrid transmission system (except for the existing buildings and A1 and A2 Buildings) with the proposed Energy Centre being the primary energy source for the site.

Island mode as an option was dismissed due to there being the need for 24/7 gas generation, which would not be aligned with the sustainability principles of the end users and would have an increased impact in terms of air and climate emissions compared to the chosen mode of connection.

Electricity supplied from the Grid

There is an existing 110 kV substation (Rinawade) located on site, which provides electricity to the existing campus. That substation has the potential to provide Phase 1 & 2 of the development with its power demands but is not capable to provide for Phase 3 due to equipment needing replacement as well as eirgrid infrastructure requiring uprating. As such, it was determined that a new replacement substation would be required on site to facilitate the full masterplan development.

The developers commissioned a study of the proposed impact of a proposed new 220 kV connection to Kellystown on the existing network through H&MV/TNEI. Extensive N-1 and N-1-1 contingency analysis was undertaken which suggested, based on the set of assumptions made, that a proposed data centre connection for Phase 3 (Buildings B2, C1, C2 and C3) via two underground cables at Kellystown 220 kV substation would be feasible without having a material impact on overloads in the Dublin area.

Following discussions with EirGrid, it was confirmed that the existing Rinawade 110 kV substation is at the end of its life and must be replaced with a new 110 kV substation. A letter of offer was presented on this basis (Ref: D14C-HF-OL).

The option to supply power to the campus through both a replacement 110 kV and new 220 kV substation was explored; however, through further analysis by H&MV, it was confirmed that a new replacement 110 kV substation, along with uprating of existing overhead lines into the campus, could provide enough electricity to power the entire campus. This meant that neither the new 220 kV substation or new grid connection would be required, and that the future reinforcement of the existing connection would provide both sufficient power to the site and greater stability to the electricity network. Refer to H&MV/TNEI study submitted with the application.

Electricity generated from gas power turbines on site

Data centre operators in the greater Dublin region are required by the CRU to have the ability to reduce consumption at the request of EirGrid in times of system constraint through the use of dispatchable on-site generation and/or storage, which meets appropriate availability and other technical requirements as may be specified by EirGrid. This is a regulatory constraint and therefore it is not permissible to operate in the absence of installing dispatchable on-site generation or storage in accordance with the system requirements set by EirGrid. It is proposed that that power will be provided via natural gas-fired turbines, which is the most sustainable of all the fossil fuels. An option to provide on-site battery storage and a hybrid approach with the gas turbines supplemented by battery storage was considered in the design process, however in this regard it is noted that EirGrid's Policy Data Centre Offer Policy Information Note (eirgridgroup.com) states *"EirGrid will provide firm capacity where a data centre provides new on-site dispatchable generation that meets the annual availability requirements…… and is capable of continuous running for extended periods, e.g. its running is not limited by fuel reserves, environmental licencing or regulatory obligations."* The Eirgrid outline includes an example which requires the dispatchable generation to be available 330 days per year. The site would not be large enough to accommodate the extent of batteries required to meet the above policy given the overall power demand as such battery storage was ruled out.

Although the most sustainable of the fossil fuels, alternative non-fossil fuels have been explored. As such, the Energy Centre has been designed as both BioGas and Hydrogen[4] ready so that when an alternative more sustainable source of energy becomes available the site can transition to a fully decarbonised energy supply.

An alternative that was explored was to have a direct supply of bio methane to the site; however, the level of bio methane required in conjunction with the unknown nature of the Grid requirements would make the Energy Centre unreliable in times of need. Furthermore, regular pumping of bio methane at the site would result in a relatively large quantity of truck deliveries. Further analysis of a potential bio-methane injection point on the site is on-going.

Regarding the supply of natural gas to the Energy Centre, Phase 1 requirements of the proposed development can be supplied via the existing gas pipelines on site. As discussed in Chapter 2 and 3, the GNI upgrades for Phase 3 will be delivered through a local extension upgrade of the gas transmission network over a length of approximately 7km from the R136 roundabout at Lucan. It is understood that the local extension upgrade would be from the existing Nangor AGI.

From here the pipeline would run underground likely via the existing rail corridor to Hillcrest Bridge at Tubber Ln Road. At this point the pipeline would likely travel east and north under Tubber Lane Rd and Stacummy Lane and then the R404 to the entrance of the site. The route has been assessed as part of the EIAR.

[4] Please see The development of an integrated hydrogen strategy for Ireland is to be prioritised, in line with the Climate Action Plan. (Consultation on Developing a Hydrogen Strategy for Ireland) (July 2022).

Other sources of power

Regarding backup fuel sources, diesel and bio diesel were explored for the Energy Centre; it was ultimately decided that renewable diesel, specifically Hydrotreated Vegetable Oil (HVO), would be the most sustainable option due to it being made from plant waste and renewable materials. For data centres, diesel and biodiesel have also been explored and diesel was chosen.

The prospective operator of the data centres has shown commitment to the use of renewable energy throughout its global business operations and is committed to investment in renewable energy in Ireland.

Furthermore, the proposed development includes an alternative source of power through the provision of roof mounted solar PV panels on all proposed new buildings, which will contribute c. 3 MW of power to the campus.

Providing Solar PV panels above all parking spaces was also explored; however, due to the level of construction required (not simply placing panels on roofs of buildings), the cost-benefit ratio was too high in favour of cost. The provision of a battery park on site to capture renewable power at times of high yield and low demand was also explored as part of iteration no. 1. This was ruled out as it was considered space intensive resulting in inefficient use of zoned land and unable to provide sustained power supply.

Wind turbines on site were considered but ruled out due to the proximity of Castletown Estate and protected views.

The provision of scalable on-site renewables to offset energy demand is limited due to the size of the campus and Kildare County Council's zoning of protected views; however, KIC is committed to carbon neutrality for the entire campus through the use of Power Purchase Agreements, provision of district heating, HVO and solar PV on campus. Furthermore, the provision of extensive biodiversity planting and green walls provide a substantial benefit and carbon capture mechanism on site.

Water Supply

The campus operations will require water to be supplied from the Irish Water network. A PCE has been submitted to Irish Water. No network upgrades are expected. The Data Centres will use the water supplied by Irish Water for domestic and evaporative cooling. The design philosophy will be to limit the evaporative cooling process to peak summer months only. The water used during these peak summer months will be supplied by on-site industrial water storage only. The industrial storage will be filled during the winter months. An alternative would be to utilise an Irish Water connection all year round which would result in additional strain on the network during peak summer months.

The Deep Tech, Energy Centre and Substation will not have an industrial water demand. To reduce both energy and water use in its data centre facilities, the data centre operator utilises direct evaporative cooling systems, which predominately utilise outside air to cool servers. Thanks to this innovative cooling solution, the proposed data centre buildings are projected to demand as little as 0.75 l/s of water on average for each of the three C buildings and 0.50 l/s for the B building.

The proposed buildings are designed to harvest a significant portion of the annual cooling water requirements and irrigation requirements through rainwater harvesting, reducing the water used from the local supply from the first year of operation.

Heat Supply

The existing campus operates off centralised heating from the campus boiler room within Building No.6, which operates from the existing gas network. As the activities of the data centres generate a significant amount of excess heat, the concept of heat recapture and district heating was explored as an alternative to traditional heating systems being provided for the campus.

Through studies by Ethos Engineering, it has been estimated that c. 18 MW of energy could be provided to the campus, community, and surrounding area through recaptured heat and the implementation of district heating.

It is proposed to include district heating as part of Phase 1 to supply the deep tech buildings on site, the existing campus buildings to be retained as well potential to supply Barnhall RFC, Salmon Leap Canoe Club, Castletown Estate as well as the future residential zoned lands known as Celbridge East KDA.

Phase 3, which is the balance of the data centres, could further provide for additional community buildings and schools in Leixlip.

An alternative design to include for the above referenced connections from the campus to the potential end users were explored but not included as part of the project as agreements have yet to be put in place between the potential end users and the landowner. It is envisioned that these discussions will continue with the aim of formulating an agreement for future waste heat use and may form part of a future planning application (Refer to Section 3.6.15 of this EIAR).

The alternative of heat recapture and district heating will have significant economic and environmental benefits to the campus, community, and surrounding area, over centralised heating or allowing for fugitive excess heat.

The project team also explored waste heat capture from the Energy Centre; however, the intermitted nature of the Energy Centre operations meant it would be too unreliable as a source of heat.

Transportation of people and goods

Government guidelines indicate a hierarchy of travel modes with walking being the highest and most sustainable form of travel.

Walking will not reduce long distance trips but encouraging walking as part of an integrated public transport journey or replacing short distance vehicle trips is an important component of mobility management, providing linkages to public transport and as an added benefit, improving health and fitness and employee wellbeing.

The aim of the internal road layout and access strategy is the creation of a workplace that is connected and provides a walkable and cyclable network, which facilitates and encourages both sustainable travel to the site and permeability within site.

The existing facility is 'closed off' and has limited connectivity regarding walking and cycling and, as such, 'opening up' the campus, and integration into the proposal of walking and cycling connections *inter alia* via the new M4 overpass bridge, was favoured over the existing 'do nothing' alternative.

In total, 320 cycle parking spaces will be provided for the new development; this will represent 15.1% of all planned parking on site. It is recognised that, overall, there is a deficit in the number of required cycle spaces for the development. However, the campus design ensures it will be easy to add capacity to cycle parking when required. Cycle parking will be then consistently monitored to ensure that there is enough supply to meet demand.

It is believed that the provision of 320 cycle parking spaces represents a more than suitable starting point given only 50 spaces are currently provided on site without a capacity issue. The 320 cycle spaces provide for more than 10% of the proposed total staff on site following the development. This is in line with government targets for 10% of travel to work by cycle mode.

Under the NTA's proposed Bus Connects programme, the hourly L58 links the Business Park with the 24hr C3 bus route direct to Dublin (via the C Spine), as well as Celbridge Hazelhatch Station, which offers daily commuter and intercity services to Dublin Heuston and Grand Canal Dock. The X32 serves as a commuter service for the park via the C corridor of bus priority measures. This off-site/cumulative development is expected to positively impact on the campus in regard to sustainable transport, over the existing alternative.

In addition, the project proposes a 'Electric Bus Charging Hub' on site, which will allow for future bus routes to enter the site. The overall scheme can adapt to future bus routes internally within the site and has been fully auto tracked by the project engineers for such sized vehicles. The project team has engaged with a potential bus operator/provider.

It is anticipated that these enhanced bus services (Bus Connects and potential separate direct connection to the campus) will provide sufficient additional capacity to meet the demands of those wishing to access the site via public transport, particularly when it is considered that the proposed L58 Bus Connects service will link the development to Leixlip-Confey Train Station on the Western Suburban Rail Corridor (Maynooth Line). Services along this line are to be significantly enhanced and capacity is scheduled to increase steadily over the next 15 years.

Providing a direct rail connection was not considered to be a reasonable alternative due to the financial cost that would be imposed on the applicant.

The site provides a gym, canteen and amenity walking areas. This will reduce the need for journeys throughout the working day away from the site over a campus that provides no synergistic uses for workers.

The proposed development includes dedicated parking for electric vehicles with associated charging points (244 EV car charging points. Again, the demand will be monitored, and

additional parking and charging will be made available if indicated by demand. Car sharing will be promoted as an alternative to individual car commuting.

As the site is an innovation campus, transport in and out of the site will naturally include heavy goods vehicles for business operations. This cannot be avoided; however, the impacts can be reduced through campus policy and initiatives, including:

- Require that third party HGV operators provide their drivers with Safe Urban Driving and education courses to include cycle awareness training, reinforcing driver awareness of cyclists and pedestrians within and around the site.

- Encourage occupants to carry out Green Fleet reviews to evaluate how sustainable their fleet operation is and identify opportunities to reduce emissions, fuel costs and expenditure. The reviews could include:

    - Vehicle choice
    - Fuel economy
    - Mileage reduction strategies

- Encourage occupants to provide eco driving training to drivers to improve the sustainability and carbon emissions of their journeys.

- Encourage occupants to consider alternative, sustainable fuel types for their fleets.

- Encourage occupants to review their grey fleet management, policies, and operation.

- For non-HGV business travel, consider pool transport options (e.g., car club, pool bicycles) on a campus-wide basis.

- Encourage occupants to provide pool bikes (including electric bikes) and cycle mileage to their staff for business travel.

- Encourage occupants to provide Leap pay-as-you-go smartcard tickets to their staff for business travel.

- Reduce the need to travel by providing high quality IT infrastructure to allow employees to benefit from high quality telecommunications for the likes of teleconferencing and remote working.

Overall, all reasonable alternatives for transport in and out of the site have been considered. It is considered that the chosen development includes a practical approach to sustainable transport and has mitigated – through anticipation within the project design – likely negative significant environmental impacts. A Mobility Manager will be appointed by the applicant/developer to co-ordinate the delivery of the initial stages of the Mobility Management Plan prepared by Systra.

Drainage

Surface water

The existing development pre-dates current surface water design standards and SuDS guidance.

This proposal must align with objectives as outlined in the Kildare County Council Development Plan 2023-2029, Leixlip LAP 2020-2023, and the applicable requirements of Kildare County Council Water Services Department draft guidance on Drainage and SuDS Strategy for SHD and LRD's.

Initial drainage proposals prepared by the project team and discussed with KCC included an alternative design with the provision of on-site attenuation tanks for rainwater harvesting at two locations. Swales, permeable surfaces and attenuation basins were also identified. Following preplanning discussions with KCC's Water Services Department, the extent of on-site attenuation tanks were reduced in favour of nature-based systems. Furthermore, increased provision of blue/green roofs, bio-retention swales and tree pits have been incorporated into the final design. Refer to the Stormwater Management Report by CSEA submitted with the planning application for further detail.

Nature-based SuDS components have been provided to control runoff frequency, flow rates, volumes and, reduce concentrations of contaminants to acceptable levels. The proposed treatment train approach assures that both runoff quantity and quality are addressed through the overall techniques of pollution prevention, source control and regional control. Bioretention ponds with sediment forebay have been proposed in this framework as in integral element to the overall site attenuation system.

As a result, the proposed development will result in a reduction of surface water discharge from the development site compared to the existing process on site (the 'Do Nothing' alternative). When compared to the initially proposed SuDS measures, the revised proposals will also serve to enhance local biodiversity through the implementation of green roofs and increased tree planting. The overall surface water drainage approach will have a net positive result on the downstream surrounding areas as the potential for flooding is reduced and the overall discharged runoff will have an improved water quality.

Foul

The proposed foul water drainage network has been designed in accordance with the requirements of Appendix B of the Irish Water Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03). As such, no alternative, other than a foul drainage scheme incorporating the requirements of Irish Water, has been considered.

The domestic and industrial foul sewer flows in an easterly direction towards two proposed pumping station which pumps to a discharge manhole adjacent to the existing Irish Water 450mmø foul sewer in the Celbridge road to the east of the site.

4.3.5 Alternative Mitigation Measures

For each aspect of the environment, each specialist (Table 1.2, Chapter 1) has considered the feasible measures to identify the most suitable measure appropriate to the environmental setting and the project design. In making a decision on the most suitable mitigation measure, the specialist has considered relevant guidance and legislation.

In each case, the specialist has reviewed the mitigation measures available and considered the use of the mitigation in terms of the likely residual impact on the environment. The four established strategies for mitigation of effects have been considered: avoidance, prevention, reduction, and offsetting. Mitigation measures have also been considered based on the effect on quality, duration of impact, probability and significance of effects.

For example, alternative noise attenuation options for were considered at the design stage of the proposed development. The two main options considered were air handling units (AHUs) with reduced noise rating or the use of screening around the AHUs. Noise modelling showed that both options afforded similar level of noise attenuation and so the decision to use screens was made on the basis of operation/maintenance grounds and not environmental grounds.

The selected mitigation measures is set out in each of the EIAR Chapters 5 – 17.

4.3.7 Conclusion

Having examined various reasonable alternative designs, layouts, uses, and processes, it is considered that the project is the preferred option in terms of the sustainable development of the subject site.

5.0 POPULATION AND HUMAN HEALTH

5.1 Introduction

This chapter of the Environmental Impact Assessment Report has been prepared by Gavin Lawlor of Tom Phillips + Associates and examines the likely impacts of the proposed development on population and human health.

Gavin Lawlor is a Director of Tom Phillips + Associates. He holds a BA (Social Science) from University College Dublin, where he graduated in 1995 with a Masters in Regional and Urban Planning (MRUP) Degree and is a Full Member of the Irish Planning Institute (IPI) with 25 years' experience.

The scope of the work includes an evaluation of the likely direct and indirect effects on population and human health (the impacts on human health has been assessed, by proxy, through the other chapters of this EIAR that are likely to impact on human health).

5.2 Project Description

The proposal will include for the demolition of some of the existing buildings on site and construction of new buildings, an energy centre and replacement substation. The proposal will include significant public infrastructure including a new signalised intersection on Celbridge Road (R404), a new Public Link Road through the campus (between Barnhall Road and the new signalised intersection), a pedestrian/cycle overpass of the M4, pedestrian and cycle links through the site and along the designated protected view corridor and supporting infrastructure. The project to which this EIAR relates also includes facilitation works which comprise uprating of existing 110kV power lines to the site and the provision of a gas transmission line to the site. The facilitation works which are included in the project do not form part of the development for which planning consent is sought. Future consents for the facilitation works will be required through EirGrid and GNI.

A detailed description of the project is outlined in Chapter 2 of this EIAR.

5.3 Methodology

The legislation, policy, and guidance outlined in Chapter 1 has informed the preparation of this chapter.

The preparation of this chapter has also been informed by desktop studies of relevant data sources including:

- Census 2011
- Census 2016
- Census 2022 (preliminary results)
- CSO Live Register
- The Economic and Social Research Institute's (ESRI) Quarterly Economic Commentary (Winter 2023)
- The Department of Health's latest policy report *Health in Ireland: Key Trends 2023*

- Grant Thornton Economic Impact Assessment (2023) (accompanies this EIAR)
- Homes & Communities Agency, UK Government Agency (2015), Employment Density Guide (3rd Edition)
- All other data used within other Chapters of this EIAR relating to human health.

5.3.1 Scoping and Heading/Topic Identification

The EPA Guidelines, 2022, state that:

> *"each* [environmental] *factor is typically explored by examining a series of headings and/or topics relevant to that factor".*
>
> [and]
>
> *"The relevant topics for any given EIAR should be established during scoping".*

5.3.1.1 Population

The method employed for scoping and identification of the relevant environmental topics for this Chapter has been based off our professional town planning and sociological knowledge/expertise.

The headings and/or topics scoped into this Chapter's population assessment are:

1. Economy
    a. National economy
    b. Local economy

2. Employment
    a. Jobs
    b. Commuter patterns

3. Housing
    a. Current housing stock
    b. Future housing stock

4. Social infrastructure and amenities

The above headings were chosen because they represent the aspects of the environment likely to have possible significant impacts caused by the project: the Economy is likely to be impacted inter alia by the increased FDI and the increased demand for products and services from third party local suppliers once the scheme is operational; employment is likely to be impacted inter alia by the construction and the establishment of multinational companies, which will require employees to run operations; housing is likely to be impacted inter alia by the increased number of employees in the area; and social infrastructure and amenities are likely to be positively impacted inter alia by the provision of a pedestrian and cyclist overpass over the M4 connecting Leixlip to the campus and its internal amenities and providing a pedestrian and cyclist route to Celbridge.

5.3.1.2 Human Health

The EPA Guidelines, 2022, state 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..**"*
>
> [Our emphasis.]

As such, the scoping of headings/topics is based off other environmental factors impacts on human health addressed in this EIAR.

Therefore, the headings and/or topics scoped into this Chapter's human health assessment are:

1. Air
2. Climate
3. Noise and Vibration
4. Land and Soils
5. Water
6. Traffic
7. Visual Impact
8. Major accidents and/or disasters

For gathering a baseline for human health in Ireland, we used the headings of life expectancy, mortality, and perceived health status; for baselines of the above headings, please see each individual Chapter, respectively.

5.3.2 Baseline Scenario/Likely Future Receiving Environment Analysis Methodology

The EPA Guidelines on the Preparation of an EIAR (EPA, May 2022) state that:

> *"It is important to demonstrate that correct methodologies and experts have been used. It is also important that the methodology used in establishing the baseline scenario is documented to permit replicable future monitoring so that the later results can be properly compared (where required). Standard recognised methods should be applied where available and appropriate."*

The baseline/future receiving environment analysis for this Chapter has been undertaken in accordance with the EPA Guidelines on the Preparation of an EIAR (EPA, May 2022) and all other documents outlined above.

5.3.2.1 Baseline Scenario Analysis Methodology

Population

In order to assess the likely significant impacts of the proposed development on population, for both the principal works and facilitation works, an analysis of the baseline

(the current state of the environment) was first performed. Data relating to the economic, demographic and social characteristics of the Local Authority (LA) area, within which the subject sites are located, were examined.

We note that 2 No. study areas were used in the demographic analysis in order to assess the impacts of the proposed development on the surrounding population, as shown in Figures 5.1 and 5.2.

The first study area (shown in Figure 5.1) provides information with respect to the local electoral district (ED) context, and includes 4 No. EDs which adjoin the subject sites within a c. 1 km radius – 'Celbridge' and 'Leixlip' EDs to which the site belongs; 'Lucan-St. Helen's' ED; and 'Donaghcumper' ED.

Figure 5.1: Extent of Local Electoral Division Study Area, comprised of EDs adjoining subject site (shown in blue) within c. 1km radius of the subject site (indicated by red dash). (Source: CSO.)

The second study area (shown in Figure 5.2) provides information with respect to the wider LA context of Kildare in terms of economic and social impacts.

Figure 5.2: Extent of Local Authority Study Area of Kildare, shown in lilac. Indicative location of subject site including a c. 1km radius from site provided in red. (Source: CSO.)

We have also examined certain national population trends. In addition we have conducted a review of the Kildare Cunty Council Development Plan 2023-2029 as well as the Leixlip Local Area Plan 2020-2023 (extended to 2026).

Human Health

The baseline for human health was gathered from a review of the Department of Health's latest policy report *Health in Ireland: Key Trends 2022* provides statistical analysis on health in Ireland over the last 10 years and deals specifically with issues such as life expectancy, mortality, and perceived health status within the country. For baselines of the headings outlined in section 5.3.1.2, please see each individual Chapter, respectively. Census figures were also gathered to provide a breakdown of the 'general health' of the local population.

5.3.2.2 Likely Future Receiving Environment Analysis Methodology

Population

The EIA Directive requires *"an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario*" (the 'Do Nothing' Scenario).

According to the EPA Guidelines, 2022, Strategic Environmental Assessments "can reduce the number of cumulative effects that need to be considered in an EIAR".

As such, to understand the likely evolution of the population if the proposed project was not implemented, we have inter alia reviewed the Strategic Environmental Assessment prepared for the Kildare County Development Plan 2023-2029 (including a review of the Development Plan itself).

We have also utilised the list of planning permissions/applications within a 5 km radius (listed in the appendices of Chapter 1), identified using Geospatial Analysis, and reasonably foreseeable projects with the site and adjacent surrounding area, and have assessed whether those developments, in combination with the project, are likely to have significant impacts on the population.

Human Health

The impacts in a 'Do Nothing' scenario on specific health proxy measures such as air, climate, noise etc. are recorded within other Chapters of this EIAR associated with Human Health, for both the principal works and facilitation works, and have been collated within this Chapter. The methodologies for those individual environmental factor assessments can be found in each relevant Chapter of this EIAR.

5.3.3 Impact Assessment Methodology

5.3.3.1 Population

The analysis of the predicted impacts of the proposed development on population during construction and operation are presented in this Chapter. The assessment considered population features, identified in Section 5.3.1, above, within the project site and the surrounding vicinity in accordance with the methodology outlined above and below, to determine the significance of the impacts. Where likely significant impacts are highlighted, mitigation and monitoring are proposed, and any residual impacts are assessed.

The impact assessment for this Chapter has been undertaken in accordance with the *EPA Guidelines on the Preparation of an EIAR* (EPA, May 2022) and all other documents outlined above. Assessment methods quantify and predict the magnitude and significance of impacts.

To predict the impact of the proposed development on the baseline environmental headings/topics, we have *inter alia*: reviewed the Grant Thornton *Economic Impact Assessment*, dated April 2023 (prepared in association with this EIAR) to determine the overall economic impact of the project; calculated the number of jobs likely to be generated by the project using the Homes & Communities Agency's (UK Government Agency) (2015) *Employment Density Guide (3rd Edition)*; calculated the housing demand likely to be generated from the permanent employment increase; and identified the social infrastructure and amenities provided or impinged by the project. In addition, we have used our professional town planning and sociological knowledge/expertise and inductive reasoning to assess/evaluate the significance of those predicted impacts.

Regarding the cumulative impacts resulting from other developments in the surrounding area, we have reviewed the Strategic Environmental Assessment prepared for the *Kildare County Development Plan 2023-2029* (including a review of the Development Plan itself). According to the EPA Guidelines, 2022, this can reduce the number of cumulative effects that need to be considered in an EIAR.

We have also utilised the list of planning permissions/applications within a 5 km radius (listed in the appendices of Chapter 1), identified using Geospatial Analysis, and have assessed whether those developments, in combination with the project, are likely to have significant impacts on the population.

5.3.3.2 Human Health

The impacts recorded within other Chapters of this EIAR associated with Human Health, for both the principal works and facilitation works, and have been collated within this Chapter.

The methodologies for those individual environmental factor impact assessments can be found in each relevant Chapter of this EIAR.

5.4 Baseline Scenario/Future Receiving Environment Analysis

5.4.1 Baseline Scenario (Current State of the Environment)

The EIA Directive requires the following to be described relating to the baseline scenario:

> *"A description of the relevant aspects of the current state of the environment (baseline scenario)".*

The following sections provide an overview of the baseline scenario.

5.4.1.1 Population

Economy

The Economic and Social Research Institute's (ESRI) Quarterly Economic Commentary (Spring 2023) suggests that "*The pace of growth in the domestic and international economies is set to be stronger in 2023 than had previously been expected.*". The Commentary states that *"The economy has performed particularly well during the pandemic and appears to have weathered the energy crisis emanating from the war in Ukraine."*.

The Commentary further states that *"Despite the ongoing resilience of the Irish economy, concentration risks in the ICT sector, a tighter monetary policy environment, ongoing uncertainties in the international economy and persistently high price levels pose major challenges to the economy."*.

With respect to the socio-economic status of local residents, the Pobal Deprivation Index utilises CSO statistics[1] to analyse areas with high levels of affluence or disadvantage throughout the country. Both the 'Leixlip' and 'Celbridge' Electoral Districts (to which the subject site belong were identified as being a 'marginally above average' area in 2011 at 5.00 and 5.49 respectively and in 2016 at 5.11 and 6.11 respectively by Pobal, values which are higher than the figures recorded for the wider county. We note that the 'Donaghcumper' ED identified to the south of the subject site had a significantly higher rating on the index and was recorded as being 'affluent' at 10.00 in 2016.

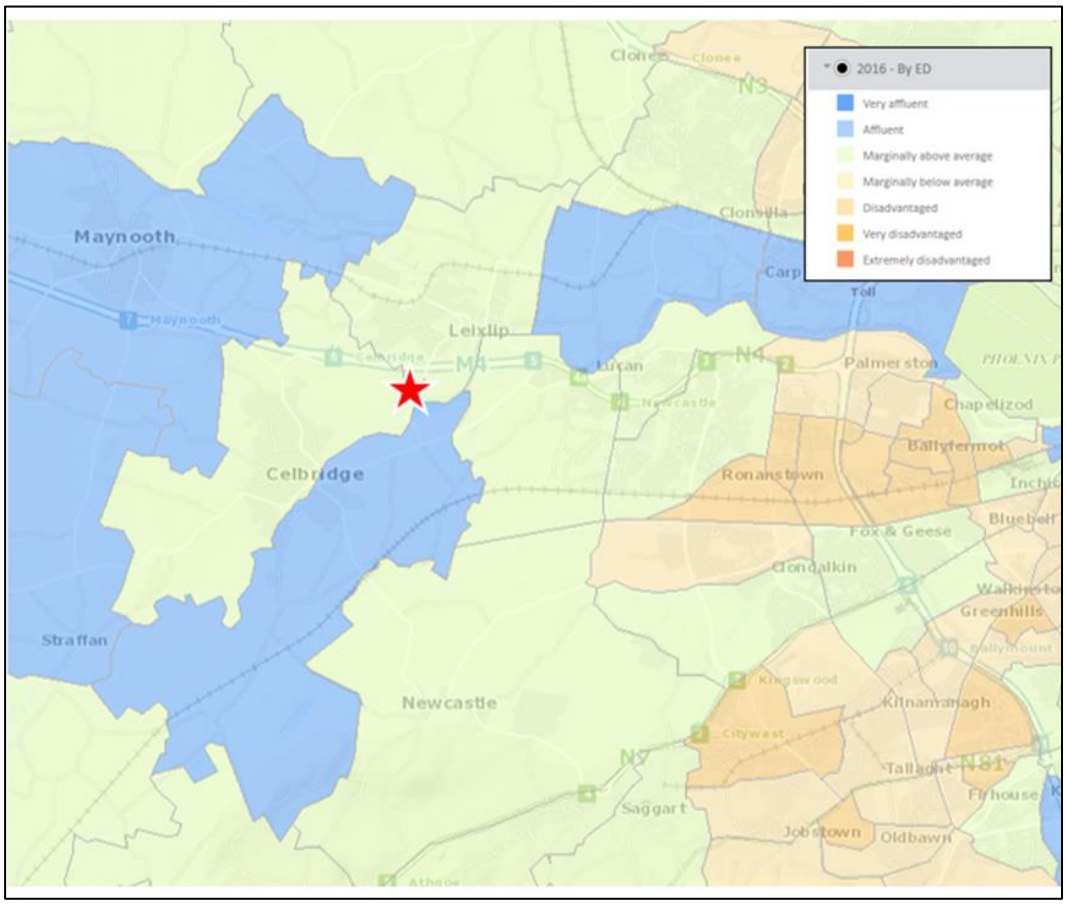


Figure 5.3: Extract of 'Deprivation Indices' Map showing 2016 deprivation index rates by Electoral District – Location of Subject Site indicated by red star. (Source: Pobal 2019, based on CSO 2016).

Area Definition	2011	2016
Leixlip ED	5.00 - marginally above average	5.11 - marginally above average
Celbridge ED	5.49 - marginally above average	6.11 - marginally above average
Donaghcumper ED	9.99 - marginally above average	10.0 - affluent
Lucan-St. Helen's ED	6.19 - marginally above average	7.41 - marginally above average
Co. Kildare	2.34 - marginally above average	3.18 - marginally above average

Table 5.1: Deprivation Indices (Source: Pobal 2023, based on CSO 2011 and 2016)

[1] Census 2022 full results have yet to be released at the time of compiling this chapter.

Employment

The most recent ESRI Quarterly Economic Commentary (Spring 2023) states that "The first few months of 2023 have been marked by continued resilience and buoyancy in the labour market; the unemployment rate was 4.3 per cent in February 2023".

ESRI "modified domestic demand (MDD) will grow by 3.8 per cent in 2023, with our preliminary forecast for 2024 indicating a growth rate of 3.9 per cent in MDD. The stronger pace of growth in 2024 reflects the expected continued slowing of inflationary pressures and the resulting tempering of monetary policy tightening by central banks".

At the local level, unemployed persons comprised c. 5% of the working population (aged 15+ years) within the ED Study Area in 2016, compared to c. 6% of Co. Kildare.

Economic Status	ED Study Area	% Total	County Kildare	% Total
At work	22,261	60%	95,947	57%
Looking for first regular job	253	<1%	1,395	<1%
Unemployed	1,938	5%	10,902	6%
Student	4,321	12%	20,559	12%
Looking after home/family	2,711	7%	14,478	9%
Retired	4,290	12%	18,890	11%
Unable to Work	1,168	3%	6,255	4%
Other	77	<1%	518	<1%
Total	**37,019**	-	**168,944**	-

Table 5.2: Socio-Economic Status of Population Aged 15+ (Source: CSO 2016).

The Live Register is a monthly measurement of the numbers of people (with some exceptions) registering for Jobseekers Benefit (JB) or Jobseekers Allowance (JA) or for various other statutory entitlements at local offices of the Department of Employment Affairs and Social Protection (DEASP). This data source, whilst not an unemployment register, can provide a general indication of recent employment trends and economic activity in the local area and wider nation.

Area Definition	2022.11	2022.12	2023.01	2023.02	1-mo. trend	3-mo. trend
DEASP Office Kildare Co.	6,390	6,458	6,362	6,352	+0.01%	+0.06%
Ireland – Unadjusted	180,884	184,642	184,736	183,401	-0.02%	+1.3%
Ireland – Seas. Adjusted	184,700	185,700	184,700	182,500	-1.1%	-1.1%

Table 5.3: Persons on Live Register by Month and Area, 2022/2023 (Source: CSO).

Live Register figures are available at a national, county or local level, with respect to the jurisdiction of DEASP welfare offices.

[1] *ESRI (Winter 2023) Quarterly Economic Commentary*

Regarding commuter patterns, a total of 15,986 No. commuters were recorded as resident within the ED Study Area in 2016, in contrast to 10,559 No. commuters which enter the area for work, school or college each day. This net outflow points to the nature of the area as a feeder site for employment hubs in Newcastle to the south and others accessible via the M4 within Dublin City to the east.

Local Electoral Divisions	Commuters resident in ED	Commuters traveling to ED	Net Flow into ED
Leixlip ED	5,041	4,864	-177
Celbridge ED	5,010	3,200	-1,810
Donaghcumper ED	2,315	775	-1,540
Lucan-St. Helen's ED	3,620	1,720	-1,900
Cumulative ED Study Area	**15,986**	**10,559**	**-5,427**

Table 5.4: Commuting Patterns of Local Residents, 2016. (Source: CSO 2016).

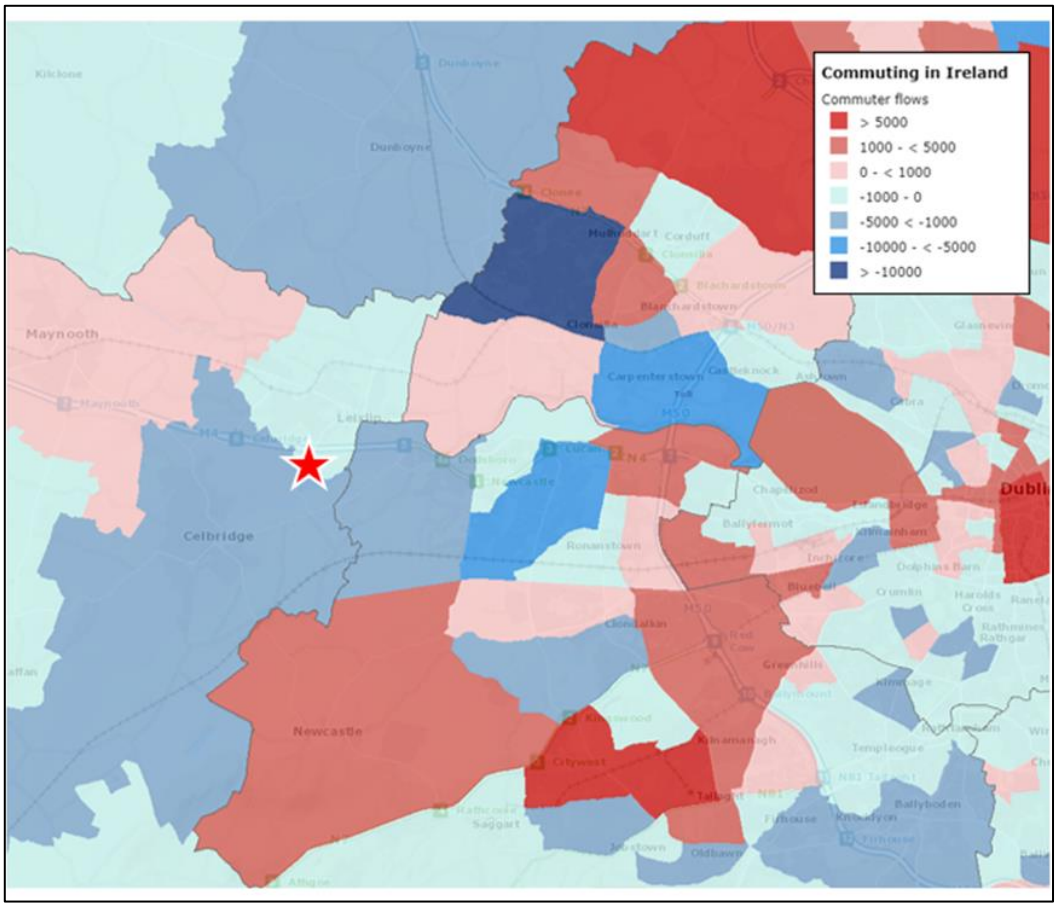


Figure 5.4: Extract of 'Commuting in Ireland' Map showing commuter flows by ED. Location of subject site indicated by red star. (Source: CSO, 2016).

Within the Electoral District Study Area, the majority of residents travel to work by private car (42%), followed closely by pedestrians (15%) and passengers in private cars (14%). Figures for Kildare County are similar, with a slightly higher percentage reported of passengers in private cars (19%).

Transport Mode	ED Study Area		County Kildare	
	No. of Persons	% Mode Share	No. of Persons	% Mode Share
On foot	4,930	15%	20,814	14%
Bicycle	927	3%	2,405	2%
Bus, minibus or coach	4,648	14%	14,365	10%
Train, DART or LUAS	1,464	4%	6,076	4%
Motorcycle or scooter	177	<1%	424	<1%
Car driver	14,132	42%	64,152	42%
Car passenger	4,746	14%	28,077	19%
Van	1,060	3%	6,007	4%
Other (incl. lorry)	45	<1%	562	<1%
Work mainly at or from home	577	2%	3,842	3%
Not stated	978	3%	4,645	3%
Total	**33,684**	-	**151,369**	-

Table 5.5: Means of Travel for Population Aged 5+ Years (Source: CSO 2016).

Housing

According to the preliminary Census 2022 results, there were increases in the housing stock in all counties. As can be seen in Figure 5.5 the largest increases were concentrated in the east.

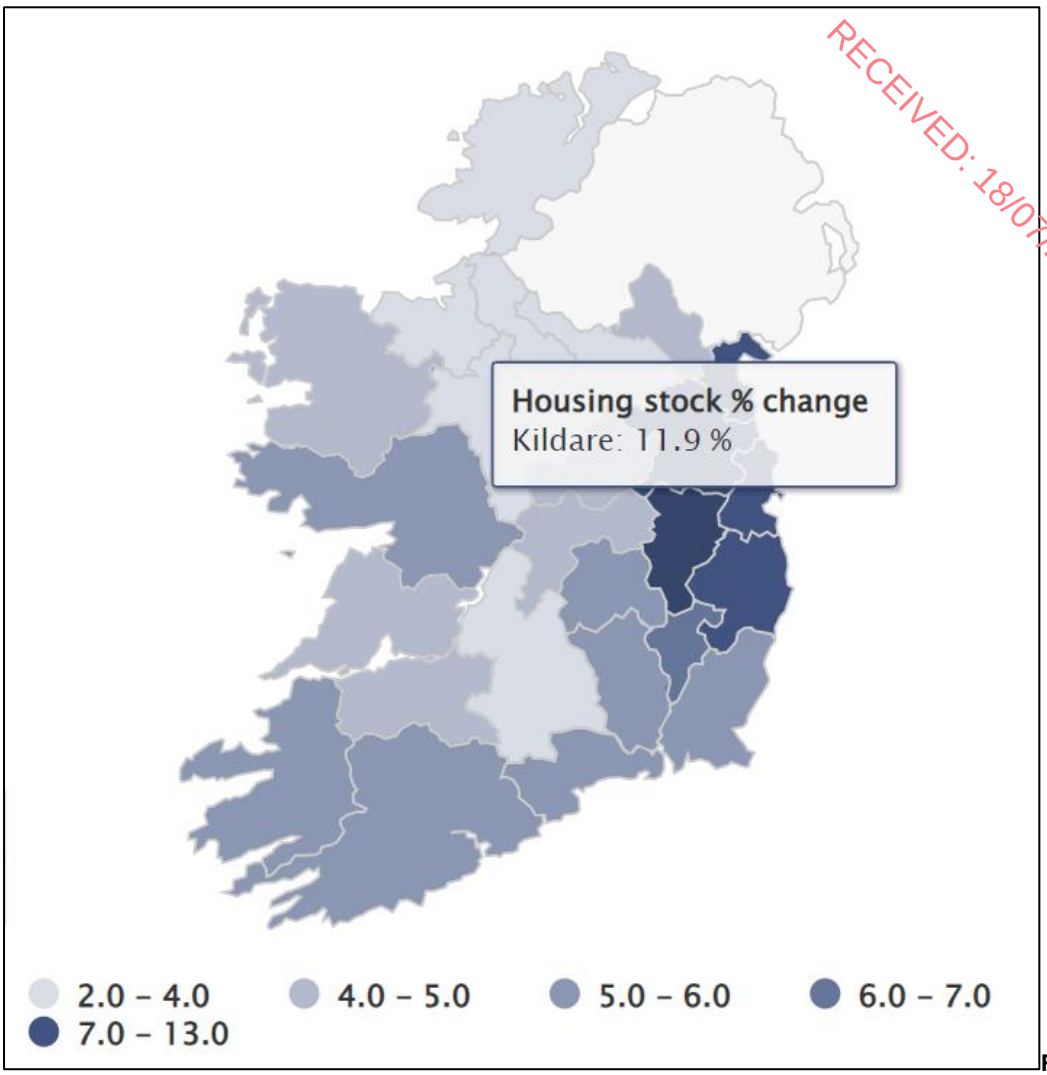


Figure 5.5: Housing stock by county, 2016 – 2022. (CSO.ie)

In Kildare and Meath, the stock of habitable dwellings went up by 12%, Wicklow was up 9% and in Louth and Dublin the housing stock rose by 7%. In these areas, the number of dwellings that were occupied went up at a similar rate. These are all areas with some of the lowest levels of vacancy in the State.

In contrast, nationally there were more modest increases of 3% in the housing stock in counties Tipperary, Leitrim, Roscommon, Cavan and Donegal.

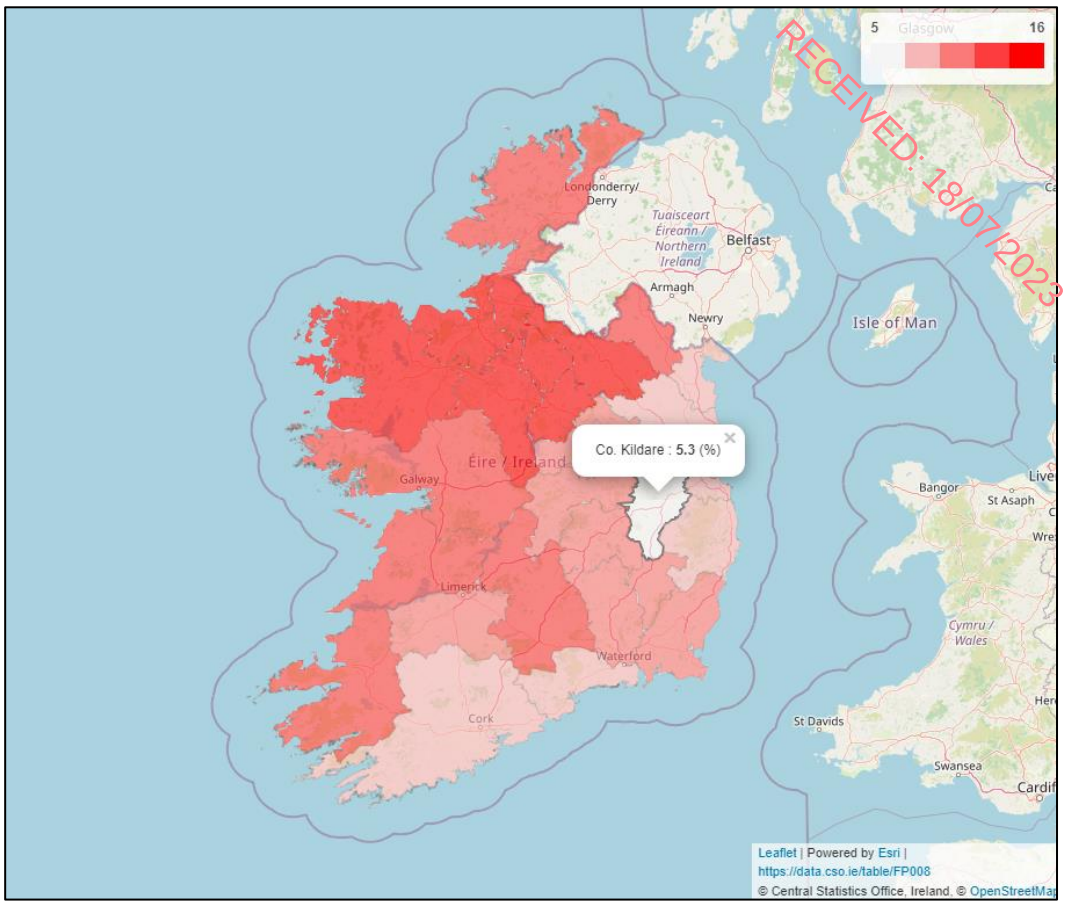


Figure 5.6: Census Vacancy rates by county, 2022. (CSO.ie)

At a State level, the Census vacancy rate has fallen to less than 8% in 2022, down from over 9% in 2016 and 12% in 2011. Kildare has the lowest vacancy rate in Ireland at 5.3%; Dublin is the next closest at 5.5%.

Rental properties accounted for over 20% (35,380 dwellings) of the vacant residential units identified in the 2022 census. This figure included short term lettings and properties that were between lets but may not have been advertised. A further almost 18,000 properties (11%) were for sale. This included dwellings that were sale agreed or recently sold.

Regarding the national future housing stock, according to the two separate reports by Property Industry Ireland (IBEC) and MyHome.ie, housing completions in 2022 and 2023, respectively, are expected to be approximately 25,000-29,000 No. homes. This is considerably short of the 33,000 No. homes per year projected to be required, as stated in the Government's 2021 *Housing for All* Policy Plan, by 2030 to meet Ireland's housing demand.

Social Infrastructure and Amenities

The Leixlip Local Area Plan 2020-2023 (extended to 2026) contains an audit of the social infrastructure and amenities in Leixlip.

The audit was structured as follows:

1. Assessing the Existing Situation;

2. Future Demand Analysis; and

3. Social Infrastructure Recommendations.

Table 7-1 (Figure 5.7, below) of the Leixlip LAP provides a breakdown of the requirements under relevant themes which provide for the future needs of the projected population. Figure 7-1 also outlines an indicative location for each of the themes detailed in Table 7-1.

Table 7-1 Social Infrastructure Needs

Theme	Zoning	Use	Potential Location	Area (HA) where applicable	Checklist	Delivery Mechanism
Education						
Primary school	E	Education	Leixlip West – Option of Zonings within Zoning Matrix	1.6	√	Dept. of Education
Primary school	E	Education	Confey – UDF – CE lands CH1	1.6	√	Dept. of Education
Secondary school	E	Education	Confey UDF – CE lands CH2	4.5	√	Dept. of Education
Childcare						
20 child places per 75 new residential units	Refer to zoning matrix	Childcare	Refer to Zoning Matrix – Provision in tandem with new residential development.	N/A	Case by case basis	Private developer-led alongside new development
Health						
1 no. primary care centre	E, TC, (A), MU, T, Q	Community Health	Options: Town Centre, Community Education, Confey Mixed Use Development, Collinstown Business Campus	c. 1ha	√	Developer / Council / Other
Social/Community						
2 no. community Services	E	Community Use	Confey UDF Community Hub Character Area, Town Centre or other CE lands.	c. 2.9ha Within Confey UDF	√	Developer / Council / Other
Arts/Culture						
New community Facility	E	Community Use	Confey UDF Community Hub Character Area, Town Centre or other CE lands.	c. 2.9ha Within Confey UDF	√	Developer / Council / Other
Faith						
Expansion of existing cemetery (short term), New Cemetery (long term)	E I	Cemetery	Confey UDF 0.4ha additional space at existing Cemetery and car parking provision within CH1. Long term provision within agricultural lands.	0.4	√	Council / Other Funding Mechanism
Outdoor Sports						
7ha of outdoor sports	F1	Open Space and Amenity	Confey New GAA facilities + 4.34 (total new 7.22ha)	c. 7.22	√	Private Developer-led alongside new development

Equipped/Designated Play Spaces						
Local areas for play	F1, F2, B, C	Open Space and Amenity, Existing Residential, New Residential	In accordance with section 17.4.7 of the Kildare County Development Plan open space shall be provided within greenfield sites at a rate of 15% of the site area. The Local Area Plan proposes to zone c. 67.8ha of strictly new residential lands within Key Development Areas and within the Confey UDF lands. The provision of local areas for play i.e. open space areas will generally equate to 15% of this overall area.	c. 10.2ha	√	Private Developer-led alongside new development
Local equipped play areas	F1, F2, B, C, E, T	Junior and Senior play space	Confey UDF, Character Area 1 Lough Na Mona OS lands Linear Parklands Celbridge Road East Linear Parklands Leixlip Amenities (Existing) The Wonderful Barn KDA Riverforest Park Open Space Area Cluster St. Catherine's Park	Range 0.25ha – 0.5ha for each equipped play space	√	Private Developer-led alongside new development with the exception of Lough Na Mona Lands and the Riverforest Park Open Space Cluster.
Neighbourhood equipped play areas	F1, F2		Confey UDF, Zone F Parklands (North-east) Lough Na Mona OS lands Linear Parklands Celbridge Road East Linear Parklands Leixlip Amenities The Wonderful Barn KDA Riverforest Park Open Space Area Cluster St. Catherine's Park	Range 0.25ha – 0.5 for each equipped play space	√	Private Developer-led alongside new development with the exception of Lough Na Mona Lands and the Riverforest Park open space cluster.
Multi-use games areas	F1, F2		Confey UDF, Zone F Parklands (North-east) Wonderful Barn KDA Leixlip Amenities Riverforest Park Open Space Area Cluster St. Catherine's Park	Range 0.3ha – 0.6 for each equipped play space	√	Private Developer-led alongside new development with the exception of the Riverforest Park open space cluster.

Figure 5.7: Table 7-1 of the Leixlip LAP.

5.4.1.2 Human Health

The Department of Health's latest policy report *Health in Ireland: Key Trends 2022* provides statistical analysis on health in Ireland over the last 10 years and deals specifically with issues such as life expectancy, mortality and other health indicators within the country.

Life Expectancy

Health in Ireland: Key Trends 2022 states that:

"Life expectancy is continuing to increase, currently standing at 84 years for women and 81 years for men. Life expectancy for women is higher than for men, as in most countries. However, this gap has narrowed in the past decade and male life expectancy in 2020 was 3.6 years below female life expectancy compared to 5.2 years in 2000."

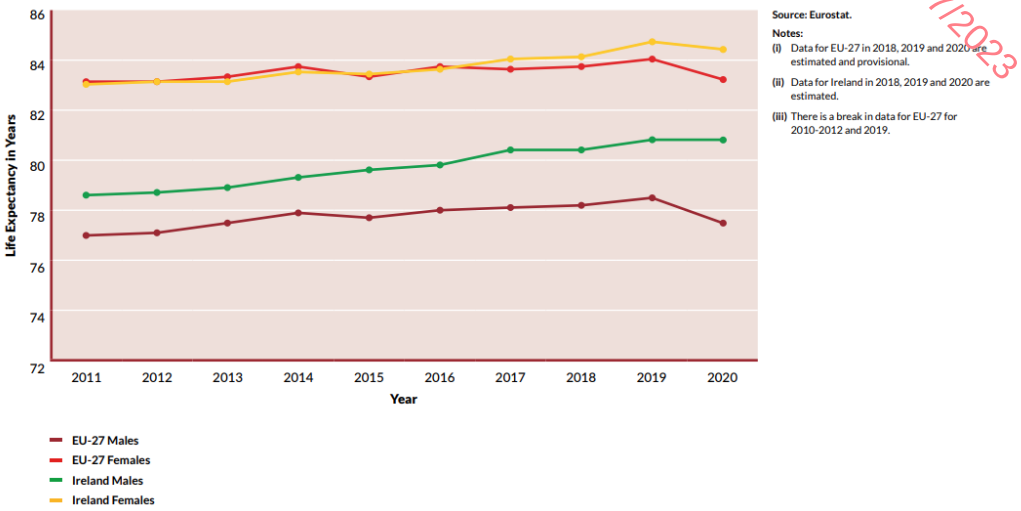


Figure 5.8: Extract from Health in Ireland: Key Trends 2022, Figure 1.5 showing Life Expectancy at Birth by Gender. Source: Department of Health, 2022**.**

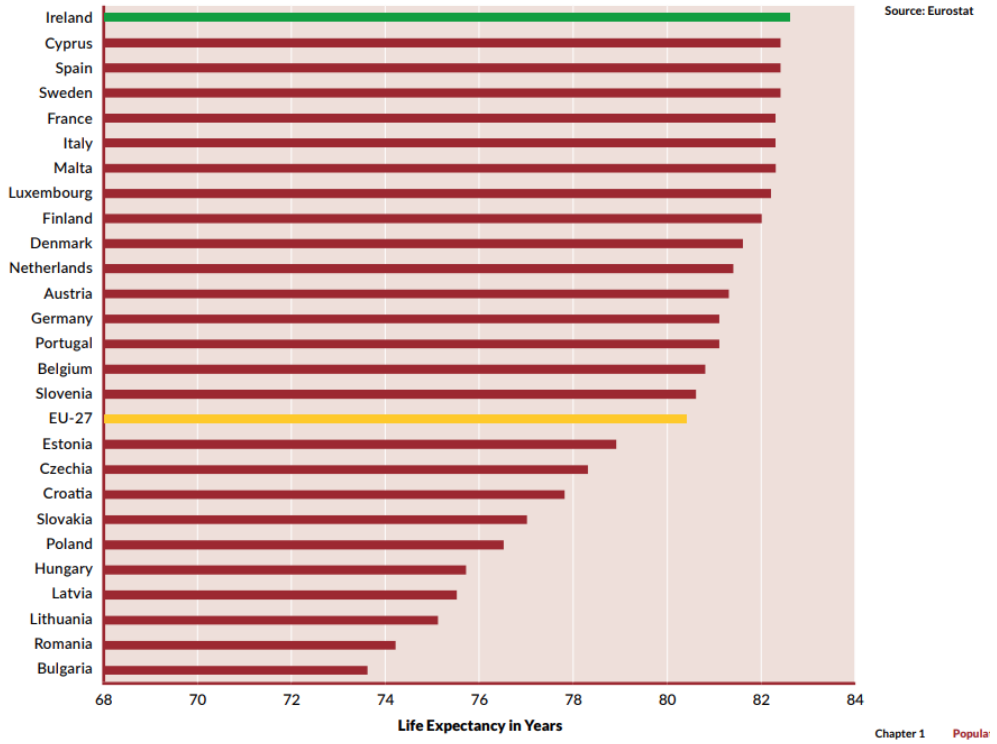


Figure 5.9: Extract from Health in Ireland: Key Trends 2022, Figure 1.6 showing Life Expectancy at Birth for EU27 Countries, 2020. Source: Department of Health, 2022.

Mortality

Health in Ireland: Key Trends 2022 states that:

"The greatest gains in life expectancy have been achieved in the older age groups reflecting decreasing mortality rates from major diseases."

Furthermore:

"age-standardised mortality rates have declined for all causes over the past decade by 15.8%. This decrease is particularly strong for mortality rates from suicide (-32.6%), Transport accidents (-54.7%), pneumonia (-59.1%) and stroke (-47.8%). Infant mortality, measured as deaths per 1,000 live births, has also decreased by 14.3% since 2011 and remains below the EU average."

Principal Causes of Death: Numbers and Age-Standardised Death Rates per 100,000 Population, 2012-2021

		2012	2016	2020	2021(p)	% change 2012-2021	% change 2020-2021
All Causes	Number	29,186	30,667	32,856	33,055	13.3	0.6
	Rate	1048.5	994.3	905.5	882.5	-15.8	-2.5
Diseases of the circulatory system							
All Circulatory System Diseases:	Number	9,480	9,237	8,835	8,753	-7.7	-0.9
	Rate	360.5	313.6	250.1	238.4	-33.9	-4.7
Ischaemic Heart Disease:	Number	4,758	4,449	4,207	4,121	-13.4	-2.0
	Rate	178.2	148.0	117.7	111.2	-37.6	-5.5
Stroke:	Number	1,935	1,830	1,548	1,423	-26.5	-8.1
	Rate	75.2	63.2	44.2	39.2	-47.8	-11.1
Cancer							
All Malignant Neoplasms:	Number	8,571	9,171	9,648	9,436	10.1	-2.2
	Rate	290.1	279.7	258.7	245.8	-15.3	-5.0
Cancer of the Trachea, Bronchus and Lung:	Number	1,801	1,976	2,041	1,985	10.2	-2.7
	Rate	60.6	59.5	54.3	51.2	-15.5	-5.7
Cancer of the Female Breast:	Number	689	755	771	686	-0.4	-11.0
	Rate	40.2	40.7	37	32.1	-20.0	-13.1
Diseases of the Respiratory system*							
All Respiratory System Diseases:	Number	3,497	3,935	3721	3,011	-13.9	-7.9
	Rate	137.6	135.8	93.4	83.0	-39.7	-11.1
Chronic Lower Respiratory Disease:	Number	1,587	1,712	1,541	1,443	-9.1	-6.4
	Rate	59.8	57.3	43.7	39.8	-33.6	-9.1
Pneumonia:	Number	1,086	1,086	759	677	-37.7	-10.8
	Rate	45.8	39.9	22	18.7	-59.1	-14.9
External causes of injury and poisoning							
All Deaths from External Causes:	Number	1,577	1,323	1,692	1,428	-9.4	-15.6
	Rate	40.9	33.0	38.7	32.4	-20.9	-16.4
Transport Accidents:	Number	162	145	114	82	-49.4	-28.2
	Rate	3.9	3.5	2.5	1.8	-54.7	-29.7
Suicide:	Number	541	437	465	399	-26.2	-14.2
	Rate	12.1	9.5	9.6	8.2	-32.6	-15.2

Source: Central Statistics Office, Public Health Information System (PHIS) - Department of Health.

Notes:

(i) (p) The figures for 2021 are provisional. They should be treated with caution as they refer to deaths registered in these years and may be incomplete.

(ii) The rates provided in the table are age-standardised to the European standard population and are presented as rates per 100,000 population.

(iii) *Excludes cancer of the trachea, bronchus and lung.

Figure 5.10: Extract from Health in Ireland: Key Trends 2021, Table 2.4 showing Principal Causes of Death and Infant Mortality Rate: Numbers and Age Standardised Death Rates Per 100,000 Population 2012 to 2021. Source: Department of Health, 2022.

Perceived Health Status

At the national level, the Health in Ireland report identifies that:

"Ireland has the highest self-perceived health status in the EU, with 82.1% of people rating their health as good or very good. The number of people reporting a chronic illness or health problem is also better than the EU average, at around 29% of the population. However, as shown in Figure 2.1, health status reflects income inequality, with fewer low-income earners reporting good health both in Ireland and across the EU."

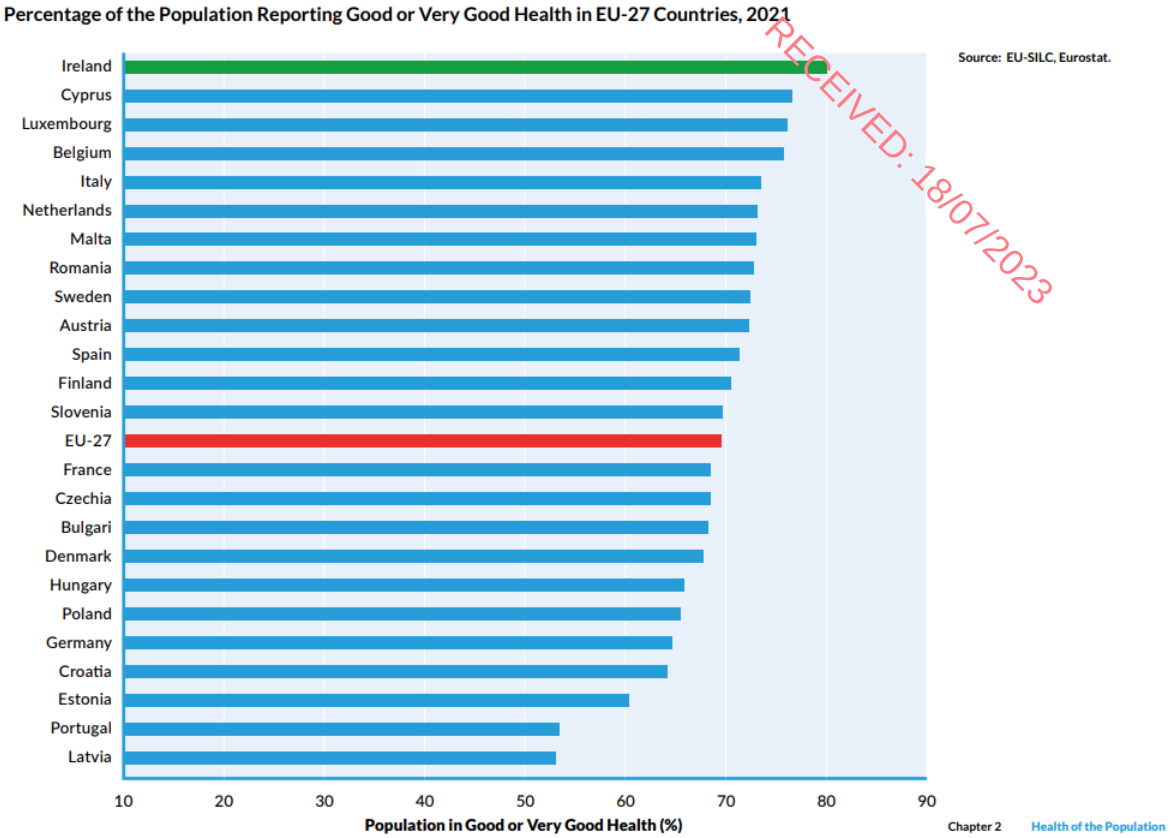


Figure 5.11: Extract from Health in Ireland: Key Trends 2022, Figure 2.2 showing Percentage of the Population Reporting Good or Very Good Health in EU-27 Countries, 2021. Source: Department of Health, 2022.

At the local level, 89.5% of people living in Kildare reported their health to be 'Good' or 'Very Good' accounting for c. 199,141 No. people within the Local Authority. These figures are mirrored within the ED Study Areas, which reported an average c. 87.5% of the population as having 'Good' or 'Very Good' health in 2016. Only an average of 1.5% of the population in each area perceived themselves as having 'Bad' or 'Very bad' health at the time of the Census.

General Health	ED – Leixlip		ED - Celbridge		Donaghcumper ED		Lucan-St. Helens ED	
	No. Person	% Total	No. Person	% Total	No. Person	% Total	No. Person	% Total
Very good	430	63	371	58	115	46.5	529	55.5
Good	179	26	189	30	95	38.5	308	32.5
Fair	58	8	52	8	28	11	63	6.5
Bad	6	1	8	1.5	2	1	9	1
Very bad	0	0	3	0.5	1	0.5	5	0.5
Not stated	12	2	12	2	7	2.5	35	4
Total	**685**	**100**	**635**	**100**	**248**	**100**	**949**	**100**

Table 5.6: Population by General Health Status – Self Reported (Source: CSO, 2016).

Over 91 per cent stated that their health was very good or good in the top 5 towns in Ireland, Malahide (92.5%), Carrigaline (92.4%), Maynooth (91.8%), Greystones (91.4%) and Celbridge (91.2%). Maynooth and Celbridge, two of the EDs within our study are, are both within the top 5.

Kildare is within the top 5 healthiest counties in Ireland alongside Meath, Dun Laoghaire-Rathdown, Cork and Wicklow.

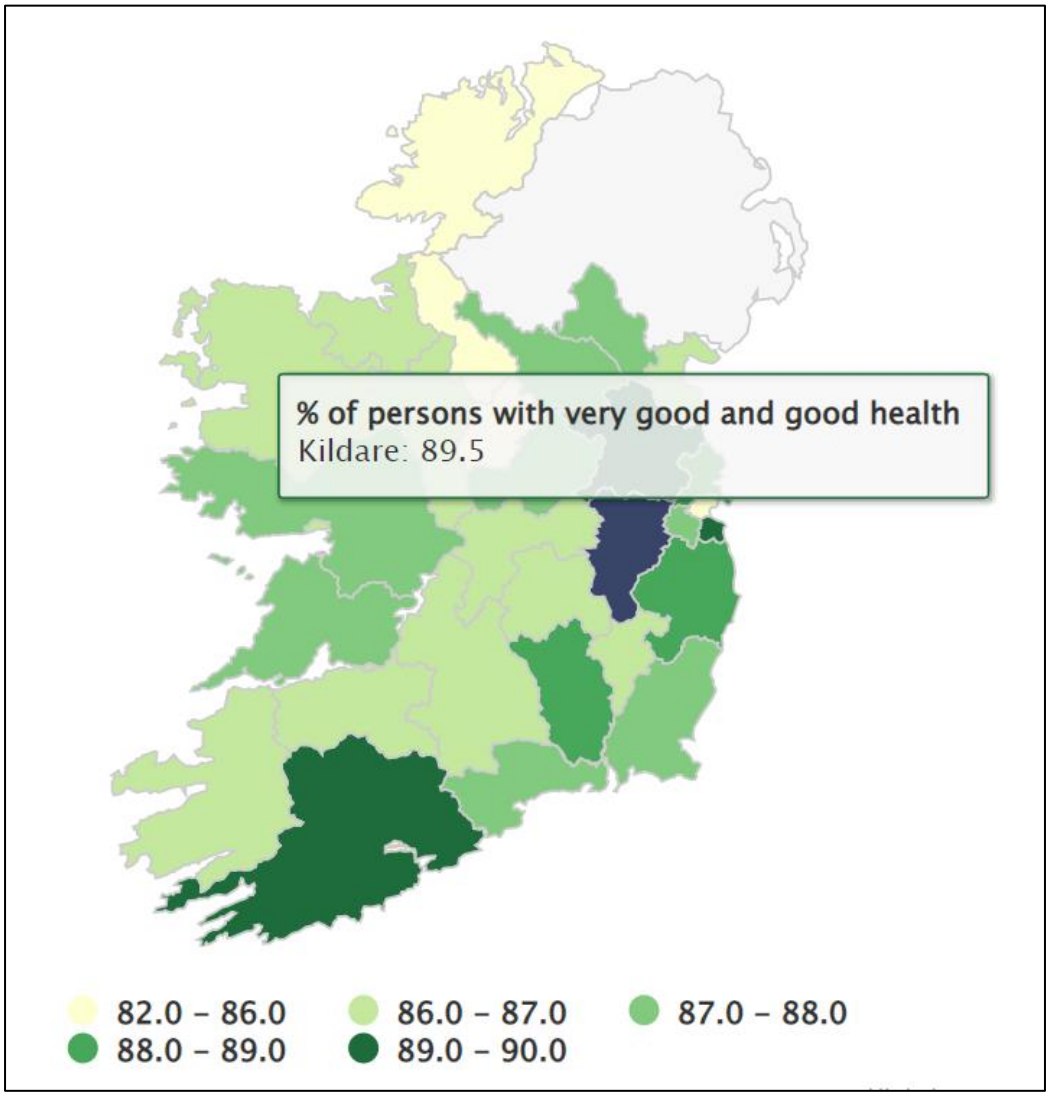


Figure 5.12: Percentage of persons with very good and good health, 2016. (Source: CSO.ie.)

5.4.1.3 Significance and Sensitivity of the Population and Human Health

Population

The significance of the local population is like that of most of Ireland; however, all local populations and communities are unique to varying degrees.

Kildare is strategically located in the centre of Ireland, with good transport links to Dublin, the capital city, and other parts of the country. This makes it an important transportation hub and an attractive location for businesses and industries.

Kildare has a diverse economy, with significant sectors including agriculture, manufacturing, technology, and services. The county is home to many major international companies, including Intel, Pfizer, and Kerry Group, which contribute to the local economy and provide employment opportunities.

Kildare has a rich history and cultural heritage, with many historic sites and landmarks. The county is also known for its horse racing heritage, with the famous Curragh racecourse located in the heart of the county.

Overall, the population of County Kildare contributes to the county's significance and importance as a major economic, social, and cultural hub in Ireland

Regarding sensitivity, the population of Kildare is dependent on certain key industries, including manufacturing, technology, and services. Changes or disruptions in these sectors, such as job losses or factory closures, can have a significant impact on the local economy and the population's livelihoods.

Housing affordability is an issue in Kildare, like the whole of Ireland, particularly in the urban areas where the population is concentrated. The high cost of housing can make it difficult for people to find suitable accommodation and may lead to overcrowding or homelessness.

The population of Kildare is also dependent on a range of infrastructure, including transportation networks, healthcare facilities, and social services. Disruptions or deficiencies in these systems can impact the population.

Overall, the sensitivity of the population of Kildare highlights the need for proactive planning and management to address the vulnerabilities and ensure the resilience of the population and the wider community.

Human Health

The significance of human health is indisputably high. Good health is an important factor in the overall quality of life. A healthy population is more likely to enjoy a high standard of living, be more productive, and contribute more to society.

Health is also often seen as a key aspect of national identity. A healthy population can contribute to a positive image of a country and help to promote tourism and other industries.

Overall, the health of the Irish population is important for a range of reasons, including its impact on quality of life, the economy, public health, social cohesion, and national identity.

Regarding sensitivity, Ireland has made significant progress in improving health outcomes in recent decades, with improvements in life expectancy and reductions in mortality rates for many diseases. However, there are still significant health challenges facing the population, including high rates of obesity, alcohol consumption, and smoking.

In addition, the COVID-19 pandemic has highlighted the sensitivity of the Irish population's health to factors such as infectious diseases and access to healthcare resources. The pandemic has had a significant impact on the Irish healthcare system, leading to disruptions in healthcare services and significant pressure on hospitals and healthcare workers.

Like many locations around the world, Kildare is vulnerable to the impacts of climate change, including flooding, extreme weather events, and changes in temperature and rainfall patterns. These can have impacts on the local environment, economy, and the health and well-being of the population.

Overall, while Ireland has made progress in improving health outcomes, there are still significant challenges facing the population, and the sensitivity of the population's health to a range of factors highlights the need for ongoing investment in healthcare, public health, and social determinants of health.

5.4.2 Likely Future Receiving Environment ('Do Nothing' Scenario)

The EIA Directive requires the following to be described relating to the future receiving environment (the 'Do Nothing' scenario):

> *"an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge".*

5.4.2.1 Population

Economy

In the event of a 'Do Nothing' scenario, the site would remain in operation as an existing ICT campus. It would mean that the national and local economy would not benefit from the estimated €5 Billion economic output of the KIC proposal (see accompanying Grant Thornton *Economic Impact Assessment*), meaning that the nation and local area would fail to capitalise on a significant opportunity for inward investment in an increasingly competitive global market.

However, as the campus is earmarked for redevelopment, the likely future scenario regardless of this specific development is that the economy would receive FDI through an alternative development if funding could be sourced; however, it is difficult to put a figure on the economic impact of an alternative likely future scheme as alternative schemes have different economic impacts depending on factors such as proposed uses and scale.

Employment

Employment at the campus and surrounding area would generally remain the same or potentially increase or decrease depending on future investment into the existing campus; the campus would remain supported for employment generation in the Kildare

Development Plan 2023-2029 and Leixlip Local Area Plan 2020-2023. Commuter Patterns would likely remain the same and the surrounding area would not benefit from the linkage of Leixlip to Celbridge through the site.

If expansion never progressed, the Kildare would not receive an increase c. 4,000 direct and c. 1,100 indirect full time employment jobs (see accompanying Grant Thornton *Economic Impact Assessment*), which would mean that the local area, county and nation would miss out on a significant opportunity for increased employment generation in an increasingly competitive global market.

Housing

Nationally, housing supply would continue to experience serious supply issues. The National Planning Framework (NPF) (2018) states that to meet projected population and economic growth, as well as increased household formation, annual housing output will need to increase to 30,000 to 35,000 homes per annum in the years to 2027 and will be subject to monitoring and review. The NPF further states that from now until 2040, an average output of at least 25,000 new homes will need to be provided in Ireland every year to meet people's needs.

The 2021 Housing for All policy plan document states a higher figure of 33,000 No. homes is needed per year until 2030. The future housing stock is currently being projected at 25,000-29,000 No. homes per year according to Property Industry Ireland and MyHome.ie.

Locally, the Kildare County Development Plan 2023-2029, through a housing needs and demand assessment, concluded the need for a housing supply target of approximately 9,144 No. housing units for the county to the end of 2028.

According to 2022 CSO data on dwelling completions, there were approximately 3,100 No. dwellings built in Kildare in 2022. If that trend continued until 2028, approximately 15,500 No. homes would be built in Kildare in that period, well exceeding the County Development Plan target of 9,144 No. housing units. As such, an alternative likely future expansion scheme would likely be able to be sufficiently housed in Kildare and or surrounding counties.

Social Infrastructure and Amenities

The existing social infrastructure and amenities at the subject site are limited to the existing campus and car parking, which provide low levels of social services to the local area. The site forms part of a designated protected view between Castletown House and the Wonderful Barn.

Whilst the protected view is currently framed by planting, it is largely inaccessible to the wider public as the campus is restricted access only. Should the project not progress, the campus would remain in operation; however, the opportunity for the provision of new access through the site and overall permeability would be lost.

If the campus did proceed with a likely alternative development or alternative developer, it is uncertain whether such infrastructure would be provided.

Cumulative Impacts

The Strategic Environmental Assessment prepared for the Kildare County Development Plan 2023-2029 has assessed the likely evolution of the County during the course of the Development Plan and the likely impacts. We have reviewed that assessment and conclude that it has reasonably assessed the likely evolution of the County through the implementation of the Development Plan. That assessment has *inter alia* considered predicted results from development of zoned land (including the subject principal site, which is zoned for redevelopment regardless of the project going ahead) in the county.

Regarding Population (and human health), the Strategic Environmental Assessment prepared for the Kildare County Development Plan 2023-2029 states that:

> *"The delivery of the Settlement Strategy in County Kildare is likely to result in an overall positive effect on population and human health through the accommodation of an additional 25,146 people. The stipulation in the Core Strategy that development be delivered in a sustainable and compact way is likely to result in a neutral environmental effect as development will be focused within the existing built-up footprint on suitably zoned, previously developed land insofar as possible. This discourages urban sprawl, reduces traffic movements, enhances the public realm and encourages more sustainable transport methods.*
>
> *The successful implementation of the policies and objectives relating to a resilient economy and job creation are likely to result in a general, overall positive effect on population and human health through the provision of job opportunities, educational opportunities, tourism opportunities and subsequent economic growth in the County.*
>
> *Similarly, the provision of high-quality transport systems and sustainable transport in County Kildare is likely to result in a positive effect on population and human health through the facilitation of movement through the county and increased opportunities for movement and exercise. However, the development of new transport infrastructure has the potential to result in negative environmental effects."*

Regarding the facilitation works site, the lands are likely to remain as is, with no impacts predicted.

5.4.2.2 Human Health

The impacts on health in a 'Do Nothing' scenario have been assessed using the proxy measures assessed in the other chapters of the EIAR such as air, climate, noise etc. for both the principal works and facilitation works and have been collated below.

Air

Under the Do Nothing Scenario no construction works will take place and the previously identified impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. The ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area, changes

in road traffic, etc. Therefore, this scenario can be considered ***neutral*** in terms of air quality.

Under the Do Nothing Scenario no operational emissions will take place. The ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area, changes in road traffic, etc. Therefore, this scenario can be considered ***neutral*** in terms of air quality.

Climate

Under the Do Nothing Scenario no construction works will take place and the previously identified impacts of GHG emissions and emissions from equipment and machinery will not occur. The climate at the site will remain as per the baseline and will change in accordance with trends within the wider area, changes in road traffic, etc. Therefore, this scenario can be considered ***neutral*** in terms of climate.

Under the Do Nothing Scenario no operational emissions will take place. The climate at the site will remain as per the baseline and will change in accordance with trends within the wider area, changes in road traffic, etc. Therefore, this scenario can be considered ***neutral*** in terms of climate.

Noise and Vibration

In the event of a 'Do Nothing' scenario, the site would remain in operation as an existing ICT campus.

It would mean the noise environment at the nearest noise sensitive locations and within the development site will remain largely unchanged resulting in a neutral and local impact in the long-term.

Waste

If the proposed development was not to go ahead (i.e. in the Do-Nothing scenario) there would be no demolition, excavation or construction at this site. Current or operational waste would continue to be generated at the same levels.

The site is zoned for development, and it is likely that in the absence of this subject proposal that a development of a similar nature would be progressed on the site that accords with national and regional policies and therefore the likely significant effects would be similar to this proposal.

Traffic

The proposed development site is part of the former Hewlett Packard campus. There are an existing ten buildings on site totalling a footprint of 130,064sqm of manufacturing, warehouse plus ancillary office, with staff facilities including cafeteria and gym. The entire footprint consists of 136,066sqm when including plant rooms and link corridors.

The occupancy of the site, at the time of the traffic counts was circa 800 staff compared to the full occupancy capacity under Hewlett Packard of circa 3,000 staff. Kildare County Council's Local Area Plan (LAP) 2020-2026 recognises that, given the size and scale of the

site, it is important to work with all stakeholders to ensure the site can be redeveloped and remain a key employment hub, both for Leixlip, and for the wider Dublin Metropolitan Area. The site is currently zoned for category H: Industry and Warehousing.

It is possible that the site be reoccupied to full capacity of circa 3,000 staff with associated traffic generation, without any planning process. The effects of the do nothing scenario are therefore considered to be neutral.

Land and Soils

It is likely that the land use will change over time even if this development does not go ahead. The associated impact of any such development will be similar to the proposed development for the underlying land soils and hydrogeological regime.

In the event of a 'Do Nothing' scenario, the subject site would remain in operation as an existing ICT campus and so potential effects are considered to be neutral.

Visual Impact

In the 'Do Nothing' scenario the lands and surroundings would be subject to incremental changes over time due to land use changes, vegetation growth and other factors.

Cumulative Impacts

Regarding human health (and population), the Strategic Environmental Assessment prepared for the Kildare County Development Plan 2023-2029 states that:

> *"The delivery of the Settlement Strategy in County Kildare is likely to result in an overall positive effect on population and human health through the accommodation of an additional 25,146 people. The stipulation in the Core Strategy that development be delivered in a sustainable and compact way is likely to result in a neutral environmental effect as development will be focused within the existing built-up footprint on suitably zoned, previously developed land insofar as possible. This discourages urban sprawl, reduces traffic movements, enhances the public realm and encourages more sustainable transport methods.*
>
> ***The successful implementation of the policies and objectives relating to a resilient economy and job creation are likely to result in a general, overall positive effect on population and human health through the provision of job opportunities, educational opportunities, tourism opportunities and subsequent economic growth in the County.***
>
> *Similarly, the provision of high-quality transport systems and sustainable transport in County Kildare is likely to result in a positive effect on population and human health through the facilitation of movement through the county and increased opportunities for movement and exercise. However, the development of new transport infrastructure has the potential to result in negative environmental effects."*

[Our emphasis.]

Regarding the facilitation works, the lands are likely to remain as is, with no impacts predicted. However, it is possible that the facilitation works, or similar, are implemented at some point in the future to facilitate alternative redevelopment on the site or on other lands in the surrounding area.

5.5 Likely Impacts of the Project

5.5.1 Construction Phase

5.5.1.1 Population

Economy

Construction is expected to be completed within a period of c. 11 years. It is predicted that the investment turnover on completion of construction will be c. €2.5 Billion. This will result in a medium-long term significant positive, indirect and direct impact on the local and national economy.

Table 4.4 Proposal Benefits: Economic Output (€ billion)

Proposal Benefits: Investment Turnover(€ billion)			
Type of activity	**Investment**	**GVA²**	**Total**
Construction	2.5	0.8	3.3
Operating¹	0.3	1.4	1.7
Total	**2.81**	**2.19**	**5.00**

¹ Estimated using operating costs based on IDA Econ. Impact of €12.4 million/year per data centre on average from existing data centres surveyed. Current proposal estimates a lifespan c.25 years
² Estimated using CSO 2020 total turnover as a ratio of its total GVA for Computer programming, consultancy and Information service activities (62,63) and Construction (41 to 43)

Figure 5.13: Table 4.4 Proposal Benefits: Economic Output (€ billion). (Source: Economic Impact Assessment prepared by Grant Thornton, dated April 2023.)

It is predicted that there will be a medium term slight positive, indirect and direct impact on local business activity during the construction phase with the increased presence of an average of 600 No. construction workers regularly using local facilities.

Table 4.2 Proposal benefits: Wages (€ Thousand)

Proposal Benefits: Wages (€ Thousand)			
Type of activity	**Direct¹**	**Indirect²**	**Total**
Construction	20,108	11,703	31,811
Operating	192,227	42,867	235,094
Total	**212,335**	**54,570**	**266,905**

¹ Estimated using total direct jobs benefited and CSO 2012-2020 average annual wages and salaries per employee in the ICT and Construction sectors respectively
² Estimated using CSO output multiplier for Computer programming, consultancy and Information service activities (62, 63) and Construction (41 to 43)

Figure 5.14: Table 4.2 Proposal benefits: Wages (€ Thousand). (Source: Economic Impact Assessment prepared by Grant Thornton, dated April 2023.)

Employment

It is anticipated that the proposed development will have a moderate positive, indirect and direct impact on employment in terms of construction, material manufacture, maintenance contracts, equipment supply, landscaping etc.

Housing

There are no likely significant negative impacts on housing predicted during construction.

Social Infrastructure and Amenities

As the campus is currently 'closed' to the public, there are no significant negative impacts on social infrastructure and amenities predicted during construction within the campus.

Construction of the M4 Overpass Bridge, although a significant piece of social infrastructure in and of itself and in the absence of standard mitigation, the construction could result in temporary slight negative effects to local amenities. However, it is not predicted to significantly impact on the existing amenities of the wonderful barn lands or the surrounding area as a construction and environmental management plan has been prepared by CSEA and submitted as part of this application.

That plan will be adhered to during construction, as well as the mitigation measures proposed within this EIAR, meaning that there are no likely significant impacts predicted on the social infrastructure as a result of human error or unintended accidental damage caused during the construction process.

5.5.1.2 Human Health

Air

A full outline of potential impacts to Air Quality is contained in chapter 9 of the EIAR. The findings can be summarised as follows:

Construction dust has the potential to cause local impact through dust nuisance at the nearest sensitive receptors. Construction activities such as excavation, earth moving and backfilling may generate quantities of dust, particularly in dry and windy weather conditions. While dust from construction activities tends to be deposited within 200m of a construction site, the majority of the deposition occurs within the first 50m. The extent of any dust generation depends on the nature of the dust (soils, peat, 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. Vehicles transporting material to and from the site also have the potential to cause dust generation along the selected haul routes from the construction areas.

The proposed development will comprise construction of an energy centre and associated ancillary development. The key civil engineering works which will have a potential impact on air quality during construction are summarised below:

During construction, an amount of soil will be generated as part of the site preparation works and during excavation for installation of foundations, drainage services and ancillary infrastructure;

- Following completion of the building shell, commissioning of the mechanical and electrical equipment is undertaken;
- Infilling and landscaping will be undertaken. Spoil generated during site preparation will be re-used where possible;
- Temporary storage of construction materials and fuels; and
- Construction traffic accessing the site will emit air pollutants during transport.

As outlined in Section 9.6, dust mitigation measures will be implemented for the construction phase of the proposed development to ensure no dust nuisance occurs at nearby sensitive receptors.

Appendix 8 of the "*Guidelines for the treatment of Air Quality During the Planning & Construction of National Road Schemes*"[31] discusses construction phase impacts. Table 9.4 shows the potential distance for dust soiling from source ranges from 25m to 100m and for the potential significant impact to PM_{10}, the distance ranges from 10m to 25m depending on the scale of the construction activity. Given that the façade of the nearest residence is greater than 100m from the nearest boundary, the guidance above would indicate that there is negligible potential for impacts from soiling, PM_{10} and to vegetation and therefore, no significant impacts are expected. The impact due to construction dust at sensitive receptors is predicted to be **long-term**, **reversible**, and **imperceptible**.

Initial commissioning activities will involve testing of the back-up generators on site for 4 hours at 90% load, i.e. the first testing sequence will be commissioning of the back-up generators. The operational modelling has considered load testing of the generators four time per year at 90% load and and this does not result in a significant impact to air quality. Therefore, it is predicted that the initial commissioning tests for the back-up generators will result in an ***imperceptibly negative*** impact to air quality in the ***short-term*** and thus have a ***not significant*** impact.

Climate

The proposed development will comprise demolition of several existing buildings and construction of Deep Tech buildings, data centres, an energy centre, a substation and associated ancillary development and facilitation works. The key civil engineering works which will have a potential impact on climate during construction are summarised below:

During demolition of Buildings No's 7, 8 and 9 there will be the potential for GHG emissions associated with the generation and movement of the waste material associated with the demolition. A combination of excavators, trucks and other soil shifting plant will undertake the main site clearance, demolitions, and levelling aspects on a phase by phase basis.

- During demolition and construction, GHG emissions from machinery will occur as part of the site preparation works and during excavation for installation of foundations, drainage services and ancillary infrastructure;
- Following completion of the building shell, commissioning of the mechanical and

electrical equipment is undertaken;

- Infilling and landscaping will be undertaken. Spoil generated during site preparation will be re-used where possible thus reducing GHG emissions from transport; and

- Construction traffic accessing the site will emit air pollutants during transport.

In relation to the facilitation works, the main work with the potential for GHG emissions is the laying of a new gas pipeline within the Barnhall Meadows Lands, underneath the M4 and into the Kildare Innovation Campus. However, the GHG emissions associated with these works will not be significant.

Noise and Vibration

The largest noise and vibration impact of the proposed development will occur during the construction phase due to the operation of various plant machinery and HGV movement to, from and around the site. In this instance, the construction phase can be classed as a mid-term phase (approximately ten years in duration on a phased basis as described in Chapter 2 Section 2.6). The nearest noise-sensitive location to the proposed development is the childcare facility to the south of the proposed development at a distance of 40 m from the boundary and a distance of 100 m from the nearest proposed building.

Based on the results of the baseline noise surveys undertaken, the ambient daytime noise level at these properties was found to be between 56 and 63 dB LAeq,15min.

Thresholds for significant noise from construction can be determined by referring to and the baseline ambient noise levels, as outlined in the assessment criteria section. The daytime significance threshold for construction noise at the site is set at 65 dB LAeq,1hr. A night-time threshold is not included as construction work will not be taking place at night.

The effect of construction noise is considered negative, not significant to moderate and medium-term.

Potential for vibration impacts during the construction phase programme are likely to be limited given the ground breaking, piling and excavations required. There is potential for piling to be used for building and basement foundations for office and apartment buildings.

In this instance, taking account of the distance to the nearest sensitive off-site buildings, vibration levels at the closest neighbouring buildings are expected to be orders of magnitude below the limits. Vibration levels are also expected to be below a level that would cause disturbance to building occupants. The potential vibration impact during the construction phase if of neutral, imperceptible and medium-term impact.

Water

Increased Run-off and Sediment Loading

Surface water run-off from site preparation, levelling and excavations during the construction phase may contain increased silt levels or become polluted from construction

activities. Run-off containing large amounts of silt can cause damage to surface water systems and receiving watercourses. Silt water can arise from excavations, exposed ground, stockpiles, and access roads.

During the construction phase at this site there is potential for a slight increase in run-off due to the introduction of impermeable surfaces, increase in hardstanding (171,641.88 m^2) and the compaction of soils. This will reduce the infiltration capacity and increase the rate and volume of direct surface run-off. The potential impact of this is a possible increase in surface water run-off and sediment loading which could potentially impact local drainage. In particular through the excavation works required to facilitate the local extension upgrades of the gas transmission network over a length of approximately 7km from the R136 roundabout at Lucan.

Excavation for foundations, services, and landscaping

The proposed development will require site preparation, excavations and levelling for foundations, the installation of services and landscaping. The GNI upgrades will be delivered through a local upgrade of the gas network over a length of approximately 1.5km Ryevale Lawns along Station Road, Old Hill and Celbridge Road for a distance of approximately 1.5km up to the entrance of Barnhall Meadows. The pipe will run under the existing road pavement. At the entrance to Barnhall Meadows, the pipe will run underground through the Barnhall Meadows lands (adjacent to the existing haul road) and will then cross the M4 Motorway through Horizontal Directional Drilling and enter the Kildare Innovation Campus then connecting to the proposed Gas Skid.

Some removal of perched rainwater from the excavation may be required. Volumes will be quite low, and all pumped water will be subject to onsite settlement before release to the Leixlip Reservoir.

Contamination of Local Water Courses

During the construction phase, there is a risk of accidental pollution incidences from the following sources:

- Localised spillage or leakage of fuels (and oils) stored on site for construction.
- Spillage or leakage of fuels (and oils) from construction machinery or site vehicles.
- Spillage of oil or fuel from refuelling machinery on site.
- Alkaline run-off due to use of concrete and cement.

Machinery activities on site during the construction phase may result in contamination of runoff/surface water. Potential impacts could arise from accidental spillage of fuels, oils, paints etc. which could impact surface water if allowed to infiltrate to runoff to surface water systems and/or receiving watercourses. However, implementation of the mitigation measures detailed in Sections 8.6.1 will ensure that this does not occur.

The magnitude of the impact for the construction phase (outlined above) without mitigation and design measures is Temporary in duration with Slight effect rating to the hydrological environment present.

Traffic

The proposed development will be constructed over three phases with the proposed Link Road delivered in phase one. For the traffic and transport assessment it has been anticipated that the full development will be occupied by 2035. Phase one and phase two will be from 2024 to 2028 while phase three is planned to start in 2028. Phase three includes the demolition of some existing buildings on site.

A Construction Traffic Management Plan accompanies this application. Estimates of traffic generation associated with the construction phase has been provided by the design team engineers, at this stage of development proposals it is anticipated that 76 vehicular movements per new unit will be generated per hour during the working day. The proposed route of construction vehicles will be to and from the M4 along Barnhall Road.

As the application progresses it will be possible to make a more informed assumption of staff traffic during construction periods. This will be agreed with the road section of Kildare County Council.

Temporary car and cycle parking facilities for construction vehicles and staff will be provided within the site boundary.

Construction traffic associated with the known facilitation works will be managed by GNI and ESB / Eirgrid, through traffic management plans.

Land and Soils

- There was no evidence of waste deposited on-site during Site investigation works carried out by IGSL in 2019. Therefore the risk of contaminated soils being present onsite is low and this was confirmed by onsite soil sampling and analysis. Nonetheless material, which is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.
- Excavation of soil will be required for levelling of the site to render it suitable for building the proposed development. Excavation of soil, tarmac and hardcore will be required for both the principal works and some of the facilitation works. The GNI upgrades will be delivered through a local upgrade of the gas network over a length of approximately 1.5km Ryevale Lawns along Station Road, Old Hill and Celbridge Road for a distance of approximately 1.5km up to the entrance of Barnhall Meadows. The pipe will run under the existing road pavement. At the entrance to Barnhall Meadows, the pipe will run underground through the Barnhall Meadows lands (adjacent to the existing haul road) and will then cross the M4 Motorway through Horizontal Directional Drilling and enter the Kildare Innovation Campus then connecting to the proposed Gas Skid.
- Local removal and reinstatement (including infilling) of the 'protective' topsoil and subsoil cover across the development area at the site will not change the overall vulnerability category for the site which is already 'high to extreme'. Capping of the energy centre, data centre, deep tech buildings and the overall substation footprint of the site by hardstand/ building following construction and installation of drainage which will minimise the potential for contamination of the aquifer beneath the site: The Locally Important Bedrock Aquifer (Ll) which is moderately productive in local zones only. Site investigation and laboratory analysis has not

identified any existing contamination with hazardous substances. Although, there is no soil quality data obtained along the route of the 110kV transmission line upgrades. No treatment of any water will be required during construction works.

- The proposed development will require site preparation, excavations and levelling for foundations, the installation of services and landscaping. It is assumed that the material removed along the roadways for the GNI pipeline upgrades is expected to be contaminated. This material will be required to be removed and disposed by a licenced contractor to an appropriate waste facility.
- As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed percolate to the aquifer. The potential main contaminants include:
- Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
    - Cement/concrete (increase turbidity and pH) – arising from construction materials;
    - Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
    - Wastewater (nutrient and microbial rich) – arising from poor on-site toilets and washrooms.

Visual Impact

The Proposed Development is located within the Northern Lowlands Landscape Character Area, which has a low sensitivity according to the current Kildare County Landscape Character Assessment. The subject site and adjacent area are situated within a generally flat to gently undulating landscape. Leixlip is situated to the north and northeast, and Celbridge is located to the southwest. The site is immediately bound by the M4 motorway to the north, Castletown House and surrounding demesne to the southwest, and the R404 to the east. Beyond the R404, the River Liffey corridor extends in a southwest to northeast alignment, swelling to form the Leixlip Reservoir. Areas to the north include the infrastructure corridor of the M4 motorway. The Wonderful Barn and its surrounding area include allotments and remnants of a formerly designed landscape, which is bound by the M4 to the south and southwest and suburban housing estates to the east, north and west. The Royal Canal is situated to the north of the study area, largely defining the footprint of residential buildings to the north of Leixlip. Castletown House and demesne forms a significant and highly sensitive open green space within the study area, which contains a historically designed landscape which includes areas of open landscape with clusters of trees and axial views defined by tree lined avenues.

In addition, the surrounding landscape within the study area is characterised by agricultural fields enclosed by hedgerows, residential and commercial premises located along the local road network and the western fringes of Lucan, located within South County Dublin lands. Notable larger scale commercial developments within the study area include Backweston Airport and Backweston Laboratory Complex to the southeast, and Intel Ireland's Leixlip Campus to the north. The Proposed Development site contains areas of mature tree vegetation and open grassland. Three drainage ponds are located within the site along the south-eastern boundary.

The Proposed Development will result in localised changes to landform to accommodate the bridge and other buildings. Construction plant, including boring equipment and lifting machinery, will be introduced, and typical construction features such as fencing, access tracks and construction compounds will be laid out. The presence and activity of construction machinery and associated features will degrade the condition of this landscape character area locally. The introduction of these features relating to construction will be temporary, medium term and reversible. The magnitude of landscape effects will be medium. Combined with a low sensitivity, the significance / quality of effects will be moderate / adverse during construction.

Adjoining landscape character areas such as the River Liffey landscape character area will remain unaffected during the construction phase apart from construction traffic crossing the river bridges. The magnitude of landscape effects will be negligible. Combined with a special sensitivity, the significance / quality of effects will be low / adverse during construction and temporary.

Landscape Character Areas located within the wider study area in South Dublin, namely Liffey Valley, Urban, and Newcastle Lowlands will not be altered by the proposed construction works. While construction traffic will pass temporarily along existing transport corridors within these landscape character areas, the landscape character will not be affected resulting in no landscape effects.

Visual Effects at Construction

Areas experiencing visual effects during the construction stage will vary depending on the active construction phase. All groundworks, demolishing, refurbishment or the construction of the buildings, road network, bridge and landscape architecture will be mainly experienced locally from within the boundary of the Proposed Development site. Views outside the development boundary and within the study area include the M4 and associated over-bridges, The Wonderful Barn and adjoining allotments, residences of Barnhall Meadows housing estate facing towards the proposed development. Intervening building structures, topography and vegetation will quickly screen the site in distances of approximately 400m from the development boundary and beyond.

Construction effects will result in:

- Potential effects to the visual amenity within the locality as a result of the visibility of construction activities such as demolitions works, the construction / refurbishment of buildings, associated scaffolding and tall equipment such as cranes and containers; and
- Effects of temporary site infrastructure such as site traffic and construction compounds especially those located in areas adjacent to sensitive visual receptors.

Photomontages 1-17 supplementing this assessment illustrate the landscape and visual effects at operational stage only. The proposed phasing of the construction works does not allow for a meaningful illustration in photomontages as these can only show one particular snapshot in time, which will not capture the dynamic and complex nature of construction works comprehensively.

Visual effects will be highest within the site, from areas immediately adjacent to the site boundary, and within a principal visual zone of approximately 400m radius from the

boundary of the Proposed Development site. Construction works of the proposed bridge will be visible along the M4 and the overbridges (R404 & Junction 6) for approximately 1.6km to the west and approximately 1km to the east although the existing bridge of the R404 will be more prominent on approach from the east. The visibility of construction works within the wider study area will be mainly limited to open areas where there are available views towards the site, that are unscreened by vegetation and intervening buildings.
Visual effects and their significance at construction stage will be temporary, adverse and range from Minor-Negligible (in the wider study area) to Major (within up to approximately 400m radius from the boundary of the Proposed Development site depending on the type of construction activities).

Major accidents and/or disasters

The following scenarios have been identified that could impact the construction phase of the project:

Extreme heat or cold weather resulting in result structural damage and/or pollution to soils, groundwater or surface waters.
Storm events resulting in structural damage and/or pollution to groundwater and surface waters.
Flooding
Pollution to soils / groundwater / surface water

The impact and likelihood of these scenarios is assessed in Table 17. 5. There are no likely impacts on the project or to off-site receptors during the construction phase in relation to major accidents and disasters.

5.5.2 Operational Phase

5.5.2.1 Population

Economy

Table 4.4 Proposal Benefits: Economic Output (€ billion)

Proposal Benefits: Investment Turnover(€ billion)			
Type of activity	**Investment**	**GVA²**	**Total**
Construction	2.5	0.8	3.3
Operating¹	0.3	1.4	1.7
Total	**2.81**	**2.19**	**5.00**

¹ Estimated using operating costs based on IDA Econ. Impact of €12.4 million/year per data centre on average from existing data centres surveyed. Current proposal estimates a lifespan c.25 years
² Estimated using CSO 2020 total turnover as a ratio of its total GVA for Computer programming, consultancy and Information service activities (62,63) and Construction (41 to 43)

Figure 5.15: Table 4.4 Proposal Benefits: Economic Output (€ billion). (Source: Economic Impact Assessment prepared by Grant Thornton, dated April 2023.)

The facilities are designed to the best international standards and will assist in attracting and retaining large businesses and workers to the area of the LGA and more particularly within a part of the county where targeted increased employment opportunities are encouraged. This represents a long-term, positive economic impact on the local economy.

The increased population will also generate additional spending within the area, which will positively contribute to local economic activity over time.

The operation of the facilitation works will facilitate the operation of a large employment generating campus that is predicted to generate a significant amount of jobs and Foreign Direct Investment. As such, the facilitation works are predicted to have a significant, positive, long-term indirect impact on the population.

There are predicted to be no significant negative impacts on the economy or on any of the other population headings/topics resulting from the operation of the facilitation works.

Employment

As found in the Economic Impact Assessment prepared by Grant Thornton, taking the proposed 195,000 sqm Gross Floor Space (GFS) and converting it into a Net Internal Area (NIA) following the 15% of the GFS recommended by the UK Employment Density Guide (3rd Edition, 2015), results in a predicted benefit to Kildare and the Mid-East region of 3,989 No. Direct jobs (FTE/year).

For the indirect jobs, estimated direct jobs were informed by the CSO output multiplier factor (2015, last review 2019) for "Computer programming, consultancy and Information service activities (62, 63)" of 1.22, which includes "Data Centre", and "Construction (41 to 43)"of 1.58 respectively. A further 1,105 jobs will be supported via indirect benefits.

Netting off existing jobs, when compared to the current headcount of 898 jobs/year, the net job benefits from the KIC is 4,196 FTE per year considering direct and indirect jobs, mostly ongoing and high skilled as one of the characteristics of Deep Tech and Data Centres.

Table 4.2 Proposal benefits: Wages (€ Thousand)

Proposal Benefits: Wages (€ Thousand)			
Type of activity	**Direct[1]**	**Indirect[2]**	**Total**
Construction	20,108	11,703	31,811
Operating	192,227	42,867	235,094
Total	**212,335**	**54,570**	**266,905**

[1] Estimated using total direct jobs benefited and CSO 2012-2020 average annual wages and salaries per employee in the ICT and Construction sectors respectively
[2] Estimated using CSO output multiplier for Computer programming, consultancy and Information service activities (62, 63) and Construction (41 to 43)

Figure 5.16: Table 4.2 Proposal benefits: Wages (€ Thousand). (Source: Economic Impact Assessment prepared by Grant Thornton, dated April 2023.)

Total direct jobs of 3,989 FTE/year operating will support €212 million in wages and salaries per annum (based on CSO 2012-2020 average annual wages and salaries per employee in the ICT and Construction sectors respectively). After applying the corresponding multiplier per sector, total direct and indirect operating wages supported by the proposal is €266 million.

Netting off the estimate of current wages supported via the companies in existing facilities (i.e. the wages from 898 existing jobs of €61m), the net operational wages benefit from the KIC is €206 million.

Housing

The impact of a large ICT campus redevelopment on existing housing supply can be complex and depend on a variety of factors. The provision of additional jobs within the LGA will increase demand for housing in the area. Assuming that this demand can be addressed through the number of existing housing developments and future developments housing prices and rents are unlikely to be significantly impacted. However, if the demand can't be addressed, this could raise prices and rents. Considering that the current national and local housing supply is strained, it is likely that proposed development will have a slight negative impact on current housing supply in the form of increased prices and rents.

The development is likely to have indirect impacts on future housing supply. The campus will create jobs and attract businesses to the area, which is likely to increase demand for housing. This is likely to lead to the construction of new housing developments in the area, increasing the overall housing supply.

If demand for housing exceeds supply, it could lead to an increase in housing prices and rents. In response to this, developers may increase construction to meet demand, and the local and national government may implement policies such as zoning changes or tax incentives to encourage new housing development. Whether housing supply catches up with demand depends on a variety of factors; however, over time it is likely that the market will adjust to changing conditions resulting in no significant impacts on future housing supply meeting future demand.

Social infrastructure and amenities

The proposed development will have a direct positive impact on social infrastructure and amenities in the area. The project includes the provision of a pedestrian and cyclist link through the site improving connectivity of Leixlip to Celbridge, which previously only consisted of a pedestrian unfriendly connection via roadways. The connection also includes a new M4 overpass bridge that connects to the Wonderful Barn lands considered to be a high local cultural significance.

Furthermore, the existing campus is currently 'closed' to the public. The project proposes to 'open' the campus up to the public providing the local and wider population with access to landscape views, trails, and overall improved feeling of synergy between the Campus and the local communities.

The proposed development is also likely to indirectly drive the development of new infrastructure and amenities in the area, such as improved transportation networks and community facilities. This can make an area more attractive to residents, which can increase demand for housing and spur new development.

Overall, the project will have a long-term positive impact on the social infrastructure and amenities of the area.

5.5.2.2 Human Health

Air

Air emissions during the operational phase of a project need to take into account the ambient air quality standards and ensure that air emissions remain in compliance with the ambient air quality standards. In relation to the proposed development, as outlined in Section 9.6, an iterative stack height determination was undertaken as part of the air dispersion modelling study to ensure that an adequate release height was selected for all emission points to aid dispersion of the plume and ensure compliance with the ambient air quality limit values at all locations beyond the site boundary.

Climate

The key works which will have a potential impact on climate during operation of the proposed development are summarised below. The facilitation works and the data halls and deep tech buildings will not be significant sources of GHG emissions:

i) The operation of the CTGs in the energy centre and the scheduled testing of the back-up generators in the data storage facilities will release GHG emission. For the purposed of this assessment, a worst-case assumption of the operation of the CTGs for 330 days per year although it is more likely that they will not operate for more than 1,500 hours per year.

ii) Indirect GHG emissions from electricity from the national grid which will power the proposed development;

iii) The infrequent emergency operation of the back-up generators for the data centres in the event of a loss of power from the National Grid due to a power outage would release GHG emissions. It has been assumed that the back-up generators will operate for 250 hours per year as a worse-case. A review of operational data from similar operational data centres in Ireland indicates that it is highly unlikely that the back-up generators would be used for emergency operations for more than 24 - 48 hours per year. This is an over-estimation of the actual usage;

iv) Road traffic accessing the site will emit GHG emissions. However, the operational phase of the proposed development will not contribute a significant volume of additional traffic on the local road network (see Chapter 13). Therefore, no local GHG emissions assessment of the traffic impact is required for this development.

The combustion turbine generators (CTG's) will be primarily fuelled by natural gas/biogas supplied by Gas Networks Ireland (GNI) via their existing high-pressure network (subject to upgrade). It is likely that the fraction of biogas in the network will increase substantially in future years. The facility will also include a 5-day supply of HVO as a backup fuel should the natural gas system be unavailable in an emergency situation. Hydrotreated Vegetable Oil (HVO) is a low-carbon biofuel that operates as a direct replacement for conventional diesel. It is made from renewable, sustainable raw materials which do not release any new CO_2 into the atmosphere. HVO is made from 100% renewable plant-waste matter and meets bio content requirements with no FAME (Fatty Acid Methyl Ester). HVO is considered to have substantially lower emissions[3] than traditional fossil fuels. It is noted that burning renewable diesel results in CO_2 emissions, however emissions from renewable diesels are significantly less than fossil fuel as growing the biomass feedstocks

for production of renewable diesel may offset the CO_2 produced in the burning of HVO. For comparison, fossil fuel derived diesel has a total lifecycle emissions of c. 94 gCO_2e/MJ while renewable diesel using waste cooking oil as feedstock can be as low as 5.6 gCO_2e/MJ.

The data centre operator, similar to the energy centre, is committed to using HVO as the back -up fuel supply for the back-up generators where available. As such, significant environmental benefits will be achieved through the use of HVO as referenced above.

The determination of The Impact of the Operational Phase on Climate the operational phase impact of the Proposed Development, prior to mitigation, based on the EPA EIAR Guidelines (EPA, 2022), is considered long-term, negative and moderate.

Noise and Vibration

The primary sources of outward noise from the proposed development in the operational context are deemed long term and will involve:

1. fixed plant at data centres and energy centre;
2. emergency site operations, and;
3. a new public link road;
4. additional vehicular traffic on public roads, and
5. a pedestrian and cycle overpass.

Reference to Table 11.11 shows that the noise levels at Location E, which is a similar distance from the M4 Motorway as NSL13, were measured at 62-67 dB L_{Aeq} for daytime periods. In this context noise from the new public link road at this location is imperceptible. The environmental noise effects are neutral, imperceptible and long-term.

The predicted increase in traffic flows associated with the development in the year 2043 will result in an increase less than 3 dB along all roads receiving traffic from the proposed development; reference to Table 11.9 shows that noise from additional traffic flow will have a negligible effect. The effect is therefore neutral, imperceptible and long-term.

These issues are assessed in detailed in Chapter 11. The overall environmental noise effects are negative, not significant to moderate and long-term.

Water

The following risks have been considered in relation to the operational phase of the development:

Surface Water

There is a direct connection to the Leixlip Reservoir east of the site which falls part of the River Liffey. The site discharges its surface water runoff directly into the Leixlip Reservoir following confirmation of water quality through electronic monitoring mechanisms inclusive of shut off valves, upstream of the existing retention ponds near the existing site entrance off the Celbridge Road. The Kilmacredock_Upper watercourse is mapped on the

EPA as flowing in a south-easterly direction through the site. This watercourse has been diverted beneath the site via a 1.5m culvert and outfalls into the Leixlip Reservoir east of the Celbridge Road. The existing and proposed development does not discharge to the Kilmacredock_Upper watercourse. The SuDs features have been designed to accommodate surface water drainage from the proposed development. Attenuation measures include bio retention areas, attenuation ponds, swales, filter drains, permeable paving and hydrocarbon interceptors. Proposed discharge rates for the Proposed Development and the overall landholding are addressed in CSEA's *Engineering Services Report Drainage and Water Services.*

Wastewater

The existing foul/wastewater inflows were pumped to the public sewerage system at the northeast corner of the site. Two pumping stations are located on the site with 200mm dia. pumping mains with provision included for future development. The existing foul pumping stations with the 200mm dia. pump rising mains shall be retained and upgraded where necessary to accommodate the new developments on the site. Upgrading shall include consideration of the pumps and automated pumping controls upgrade/updating/replacement etc. Underground 24-hour storage tanks shall be provided at each of the existing stations.

The route of the existing pumping mains from the stations shall be realigned to facilitate the new development, as shown on CSEA Drawing No's . 21_048-CSE-ZZ-ZZ-DR-C-2200, 21_048-CSE-ZZ-ZZ-DR-C-2210 - 1_048-CSE-ZZ-ZZ-DR-C-2218 submitted as part of the planning application.

A new, additional pumping facility shall be provided to service areas of development outside the catchments of the existing stations. There are no new requirements for new foul connections outside of the overall landholding. The wastewater discharged from the site will ultimately discharge to the Waste Water Treatment Plant at Leixlip. There are no proposed process water emissions. The proposed foul network will be designed in accordance with the Uisce Éireann Code of Practice for Wastewater.

It is not proposed to discharge any trade effluent to the foul sewer.

Refer to CSEA's *Engineering Services Report Drainage and Water Services.* for further design information.

A pre-connection enquiry (PCE) form was submitted to Uisce Éireann which addressed water and wastewater demand for the development. A response to the Pre-Connection Enquiry is awaited. Any upgrade works to the surrounding area will be identified within the Confirmation of Feasibility.

Refer to CSEA's *Engineering Services Report Drainage and Water Services* for further information.

Fuel and Other Accidental Spills

There is a potential for leaks and spillages from the proposed fuel oil generators to occur on site. In addition to this there is a potential for leaks and spillages from vehicles along

access roads, loading bays and in parking areas. Any accidental emissions of oil, petrol or diesel could cause contamination if the emissions enter the water environment unmitigated.

In the event of a fire at the facility, firewater will also need to be contained or it may contaminate receiving waters.

The fuel for the generators will be stored in individual, double-skinned storage tanks. Each tank has the capacity to store 15.5 m^3 of diesel; Each tank has the capacity to store 15.5 m*3* of diesel; therefore, a total of 1,240 m*3* across all Data Centres (or 1066 tonnes at a density of 0.86 tonnes / m*3*). The energy centre will have its own HVO bulk storage of c.3440 tonnes.

As there is full containment for bulk fuel oil, use of interceptors as part of the SuDS approach, additional dilution within the attenuation ponds and no direct pathway to surface water from this site there is no likely potential impact on offsite watercourses.

Increase in Hardstanding

There will be an increase in overall hardstand as a result of the proposed development of c. 171,641.88 m^2. The existing site has a total hardstanding of c. 86029.00 m^2. The proposed development will have a total hardstanding of c. 257, 670.88 m^2. This may increase the run-off rates from the proposed development site into receiving surface waterbodies (Leixlip Reservoir, River Liffey). However, the proposed development will follow the SuDS and surface water management strategy; utilising an innovative natural based SuDS components to provide the necessary processes to control runoff frequency, flow rates and volumes. Attenuation measures include bio retention areas, attenuation ponds, swales, filter drains, permeable paving and hydrocarbon interceptors. This will have a net positive result on the downstream surrounding areas as the potential for flooding will be reduced and the overall discharged runoff will have an improved water quality due to the proposed SuDS upgrades.

Proposed discharge rates for the Proposed Development and the overall landholding are addressed in CSEA's *Engineering Services Report Drainage and Water Services.*

In the absence of mitigation measures, the operational phase of the proposed development will likely have a Neutral, Long-Term and Slight impact.

Traffic

To assess the traffic and transportation impacts of the proposed development vehicular trip generations has been developed based on first principles for the data centre element and using TRICS database for the deep tech. It is anticipated that the energy centre will not generates traffic during the peak periods.

Trip distribution and assignment of trips is based on existing movements from the current site occupants to assess the likely percentage to route east and west from the site. The internal road layout, car park positioning and access and land use positioning within the campus was then used to formulate the distribution of traffic from the development onto

the road network. All HGVs are routed west of the site towards the M4 interchange allowing access to the strategic road network.

The proposed development traffic distributed onto the network is then assessed using a microsimulation software package, VISSIM. This allows an assessment of the traffic impact on the surrounding road network overall.

The results demonstrate that during the operation phase, aside from the access roads, the proposed development will contribute up to a maximum of 7.3% on the M4 on slip westbound from the interchange junction.
As per the rating off effects in traffic contribution in Table 13.7, which is based on a conservative interpretation of the EPA Guidelines and IEMA Guidelines, the proposed development is expected to result in a 'slight' or less effect on the majority of the local roads.

It is noted that a 36.6% and 16.3% impact is predicted on the access roads from the west and east of the site respectively, however this is to be expected as they comprise the two access roads, Barnhall Road and the R404, into the proposed development The base flow on these junctions is low with counts taken in 2022 at a time that the campus was not fully operational with the impact percentage therefore representing a higher-level change than if the current campus was fully operational.

Full details of potential operational impacts from traffic are outlined in chapter 13 of the EIAR.

Land and Soils

The potential effects arising from the operational phase of the development are outlined in section 7.6.2 of the EIAR. The following risks have been considered in relation to the operational phase of the development:

- There will be an increase in overall hardstand as a result of the development of c 171,641.88 m^2.
- The SuDs design has been provided to control runoff frequency, flow rates, volumes and, reduce concentrations of contaminants to acceptable levels. The proposed treatment train approach assures that both runoff quantity and quality are addressed through the overall techniques of pollution prevention, source control and regional control. Bioretention ponds with sediment forebay have been proposed in this framework as in integral element to the overall site attenuation system. The proposals provide an integrated and innovative surface water drainage design solution which manages water quality and quantity in accordance with Kildare County Council objectives.
- There is a potential for leaks and spillages from vehicles along access roads and in parking areas. Any accidental emissions of oil, petrol or diesel associated with fuel storage tanks for the energy centre and belly tanks for the data centres could cause soil/groundwater contamination if the emissions are unmitigated.
- In the event of a fire, firewater could become contaminated and in the absence of mitigation may contaminate soil and groundwater.
- Groundwater abstraction does not form part of the proposed development. There will be no impact on local or regional groundwater resources (abstraction) as a result of the proposed development.

- These potential impacts are not anticipated to occur following the implementation of mitigation measures outlined in Section 7.6.

The residual cumulative impact on land, soils, geology and hydrogeology for the construction and operation phases is anticipated to be Long-Term, Neutral in terms of quality and Not Significant, once appropriate mitigation measures are implemented in accordance with the CEMP and in compliance with the legislative requirements for each development.

Visual Impact

The Proposed Development is located in a generally gently undulating landscape and therefore even relatively low vegetation or intervening buildings will provide screening to receptors. The highest visual impacts tend to occur where there is no or little intervening vegetation between the viewer and the Proposed Development within the Proposed Development site, along its periphery (sections of the R404), or where the viewer is at an elevated position (refer to Photomontage 15 – top of Wonderful Barn). The majority of significant visual effects will occur from locations within the Proposed Development site or in close proximity to it (up to approximately 300m) as dense bands of woodland along the boundaries of the M4 (refer to Photomontage 8), the grounds of Castletown Demesne (refer to Photomontages 10 – 12), within the area around The Wonderful Barn, and publicly accessible locations along the River Liffey (refer to Photomontage 1) will screen the Proposed Development fully.
Views of the upper sections of the proposed Building A1 and the pedestrian / cycle bridge across the M4 can be experienced from the R404 road bridge crossing the M4 (refer to Photomontage 7), where the upper sections of additional building structures will become visible to already visible existing structures.
Open views of sections of the Proposed Development will be possible from the R404 / Celbridge Road. While roadside vegetation will screen considerable parts of the Proposed Development, views will be available at the vehicle entrance areas and where there are gaps in the roadside vegetation (refer to Photomontages 2, 3, 4, 6). View of the proposed pedestrian / bridge will be possible along the M4 (refer to Photomontages 7 & 8) as well as from the grounds of The Wonderful Barn (refer to Photomontages 14 – 17).
The existing protected viewing axis between Castletown House and The Wonderful Barn will not be altered and remain unaffected by the proposed development (refer to Photomontages 12 – 15).

In total, 17 photomontages have been prepared illustrating the nature of visibility of the proposals at key viewpoint locations. The detailed assessment of each view below should be viewed in conjunction with the photomontage booklet contained in Appendix 16.1, which also contain detailed viewpoint location information including the distance of each viewpoint to the Proposed Development.

Major accidents and/or disasters

The potential hazards associated with substances stored and process at for the proposed Principal works which have the potential to cause a major accident are summarised in the following section. All hazards identified require a loss of containment to occur, such as, catastrophic damage or failure of pipework and/or storage tanks.

Fire:

- Flash Fire: A flash fire can occur following a loss of containment of natural gas from the natural gas pipeline, which results in a flame which passes through the mixture at less than sonic velocity such that explosion overpressures are negligible. A flash fire may be caused by releases at high or low pressure into an open, unconfined area which contacts an active source of ignition.
- Jet Fire: A jet fire can occur following a loss of containment of natural gas from the natural gas pipeline, via a source such as a leak or failure of flanged pipework joints, pipework or another asset which contacts an active source of ignition.

Explosion:

- Vapour Cloud Explosion (VCE): A loss of containment of natural gas, within a turbine enclosure, which does not ignite immediately may form a cloud of flammable material depending on the conditions of the release. If this cloud contacts an active source of ignition, a VCE can result and generate potentially harmful overpressures.

Major Accident to the Environment (MATTE):

- A loss of containment of liquids, such as fuel oils, which are accidentally released to water, land and/ or groundwater in significant quantities can cause harm to the environment.

The impact and likelihood of these scenarios is assessed in Table 17. 4. In keeping with EIA guidance these results are a summary of the Land Use Planning Assessment (report reference: MM.237501.0007RR01). There are no likely impacts to off-site receptors, as a result of the proposed Principal works, during the operational phase in relation to major accidents and disasters. The level of risk on-site is acceptable.

The Land Use Planning assessment has determined the risk zones for the proposed Principal works. Section 8.0 of the assessment illustrates the Land Use Planning risk contours for the proposed Principal works. The assessment concluded that the risk contours do not extend off-site; therefore, there are no impacts to off-site receptors.

The potential hazards associated with substances stored and process at for the proposed Facilitation works which have the potential to cause a major accident are summarised in the following section. All hazards identified require a loss of containment to occur, such as, catastrophic damage or failure of pipework.

Fire:

- Flash Fire: A flash fire can occur following a loss of containment of natural gas from the natural gas pipeline, which results in a flame which passes through the mixture at less than sonic velocity such that explosion overpressures are negligible. A flash fire may be caused by releases at high or low pressure into an open, unconfined area which contacts an active source of ignition.
- Jet Fire: A jet fire can occur following a loss of containment of natural gas from the natural gas pipeline, via a source such as a leak or failure of flanged pipework joints, pipework or another asset which contacts an active source of ignition.

The impact and likelihood of these scenarios is assessed in Table 17. 4. There are no likely impacts on the project or to off-site receptors during the operation phase in relation to major accidents and disasters associated with the Facilitation works.

5.6 Mitigation Measures and Monitoring of Impacts

5.6.1 Construction Phase

Population

No negative significant impacts on the population have been identified in relation to the construction of the proposed works.

A construction and environmental management plan has been prepared by CSEA and submitted as part of this application.

That plan will be adhered to during construction, as well as the mitigation measures proposed within this EIAR.

As such, no further mitigation measures are required.

Human Health

In the absence of appropriate mitigation, there is potential for significant impacts on human health during the construction phase of the project.

These potential impacts on human health, as outlined above have been identified and assessed in the various chapters of the EIAR as prepared by the various Design consultants. Appropriate mitigation measures have been proposed in relation to Air, Noise and Vibration, Climate, Hydrology, Major Accidents etc.

Mitigation measures are outlined in each respective chapter as well as in Chapter 19 of the EIAR. Effects to Human Health arising from the construction phase are expected to be neutral provided mitigation measures referred to above are adhered to.

5.6.2 Operational Phase

Population

No negative significant impacts on the population have been identified in relation to the operation of the proposed works and, as such, no mitigation measures are required.

Human Health

In the absence of appropriate mitigation, there is potential for significant impacts on human health during the Operational phase of the project.

The potential impacts on human health, as outlined above have been identified and assessed in the various chapters of the EIAR as prepared by the various Design consultants. Appropriate mitigation measures have been proposed in relation to Air, Noise and Vibration, Climate, Hydrology, Major Accidents etc.

Mitigation measures are outlined in each respective chapter as well as in Chapter 19 of the EIAR. Effects to Human Health from the operation of the proposal are expected to be neutral provided mitigation measures referred to above are adhered to.

5.7 Likely Cumulative and Interaction Impacts of the Project

5.7.1 Cumulative Impacts

As discussed earlier in the Chapter, the Strategic Environmental Assessment prepared for the Kildare County Development Plan 2023-2029 has assessed the likely evolution of the County during the course of the Development Plan and the likely impacts. We have reviewed that assessment and conclude that it has reasonably assessed the likely evolution of the County through the implementation of the Development Plan. That assessment has *inter alia* considered predicted results from development of zoned land in the county and the in-combination impacts of development on those zoned lands.

Regarding Population (and human health), the Strategic Environmental Assessment prepared for the Kildare County Development Plan 2023-2029 states that:

> *"The delivery of the Settlement Strategy in County Kildare is likely to result in an overall positive effect on population and human health through the accommodation of an additional 25,146 people. The stipulation in the Core Strategy that development be delivered in a sustainable and compact way is likely to result in a neutral environmental effect as development will be focused within the existing built-up footprint on suitably zoned, previously developed land insofar as possible. This discourages urban sprawl, reduces traffic movements, enhances the public realm and encourages more sustainable transport methods.*
>
> *The successful implementation of the policies and objectives relating to a resilient economy and job creation are likely to result in a general, overall positive effect on population and human health through the provision of job opportunities, educational opportunities, tourism opportunities and subsequent economic growth in the County.*
>
> *Similarly, the provision of high-quality transport systems and sustainable transport in County Kildare is likely to result in a positive effect on population and human health through the facilitation of movement through the county and increased opportunities for movement and exercise. However, the development of new transport infrastructure has the potential to result in negative environmental effects."*

Regarding the principal works, it is predicted that the cumulative impacts of the project on other surrounding projects on the economy and employment will be long-term, positive and significant due to the impacts likely to result from the synergy between the campus and developments such as Intel and Maynooth University. Surrounding residential developments will also positively combine to provide housing for workers in the surrounding area as well as planned infrastructure projects such as Dart+ Southwest and Bus Connects.

Regarding the facilitation works site, no impacts in combination with the impacts of other surrounding projects are predicted on population.

5.7.2 Interaction Impacts

The potential for interaction of impacts between various factors of the development and the population and human health of the area have been identified in various chapters throughout the EIAR. Among the main sources of These potential interactions would be Air and Climate, Nose and Vibration, Traffic and Transportation, Waste generation and Landscape and Visual Impact.

Full details in relation to potential interactions of various impacts associated with the project and an assessment of the extent of these impacts are outlined in Chapter 18 of the EIAR. No significant negative interactions have been identified in this regard.

5.8 Mitigation Measures and Monitoring of Cumulative and Interaction Impacts

5.8.1 Construction Phase

There are no mitigation measures proposed for the likely cumulative impacts as none are considered negative and significant.

5.8.2 Operational Phase

There are no mitigation measures proposed for the likely cumulative impacts as none are negative and significant.

5.9 Major Accidents and/or Disasters

The EPA Guidelines, 2022, state that:

> *"To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and /or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other legislation e.g. a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment.*
>
> *The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g. the potential effects of floods on sites with sensitive facilities. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required."*

As discussed above, the impact and likelihood of these scenarios is assessed in Table 17. 4. In keeping with EIA guidance these results are a summary of the Land Use Planning Assessment (report reference: MM.237501.0007RR01). There are no likely impacts to off-site receptors, as a result of the proposed development, during the operational phase in relation to major accidents and disasters.

The Land Use Planning assessment has determined the risk zones for the proposed development. Section 8.0 of the assessment illustrates the Land Use Planning risk contours for the proposed development. The assessment concluded that the risk contours do not extend off-site; therefore, there are no impacts to off-site receptors.

5.9.1 Mitigation Measures and Proposed Response to such Emergencies

The proposed development has been designed in line with good industry practice, and, as such, mitigation against the risk of major accidents and/or disasters is embedded through the design and in accordance with planning and legislative requirements.

5.10 Residual Impacts

The residual effects are the final predicted or intended effects which occur after the proposed mitigation measures have been implemented. It will not always be possible or practical to mitigate all adverse effects.

The overall likely residual impacts on population and human health during the construction phase of the project have been predicted to be s***hort-term, negative and imperceptible***.

The overall likely residual impacts on population and human health during the operational phase of the project have been predicted to be ***long-term, positive and significant***.

In terms of residual impacts on population and human health, the project is assessed under the headings **of *Air*, c*limate, noise and vibration, Water, Traffic, Land and Soils, Visual Impact, Major Accidents and Disasters***.

Air

Modelled emissions associated with the facility will lead to ambient concentrations which are within the relevant ambient air quality standards for all pollutants modelled. There are no significant residual impacts on air quality due the proposed development associated with the operation of the facility.

Climate

Once the mitigation measures outlined in Section 10.6 are implemented, the residual impacts on climate from the construction of the Proposed Development will be ***short-term*** and ***imperceptibly negative.***

Once the mitigation measures outlined in Section 10.6 are implemented, the residual impacts on climate from the operational phase of the Proposed Development will be **indirect, *long-term, negative*** and ***minor adverse.*** Thus, in terms of climate, both the construction phase and operational phase of the Proposed Development will be ***not significant.***

Noise and Vibration

The construction noise assessment has shown that in accordance with the 'significance' thresholds presented in the BS 5228-1 there is not a significant impact at noise-sensitive locations in terms of ambient noise levels subject to appropriate management of the issues on the site as presented in Section 11.6.1.

The robust operational noise assessment of fixed plant associated with the proposed development has shown that there will be a negative, not significant to moderate, long-term effect at the NSLs identified on Figure 11.1. The predicted change in background noise level due to current application is between 1 to 4dB during night-time periods as shown in Table 11.19. Ambient noise levels are and will continue to be dictated by road traffic noise in the area while a low level of plant noise is expected to be audible during lulls in other sources (e.g. distant traffic noise).

The operational noise assessment of vehicle movements associated with the site has shown that in accordance with the scale in the EPA EIA Report Guidelines 2022 there will be an imperceptible impact off site noise sensitive locations considering existing traffic volumes on the local road network.

Water

In the case of the Proposed development, there will be no significant residual impacts; the potential impact on surface water during operation and closure will be l***ong term, imperceptible*** and ***neutral*** i.e. an impact capable of measurement but without noticeable consequences.

Traffic

The effect of the construction phase in terms of traffic and transport will be ***imperceptible and short-term*** in nature. The measures outlined in the CEMP, will help alleviate the effect of the additional traffic and limit the effect to outside the busier peak hours. The measures, including wheel washing and dust mitigation, will also ensure the standard of the public road network is maintained in terms of dust and dirt from construction traffic.

With the mitigation measures in place, the effect of the proposed development on traffic and transport is envisaged to be slight, likely in probability and long-term. The proposed development is located within an area with well-integrated walking infrastructure to encourage sustainable travel choices to and through the proposed development. The Mobility Management Plan initiatives are likely to result in lower volumes of car traffic than that assumed in the modelling assessment.

Land and Soils

Following the implementation of mitigation measures detailed in chapter 5, the predicted impact on the geological and hydrogeological environment during the construction phase is ***neutral, imperceptible*** and ***short-term,*** the magnitude of impact is considered ***negligible***.

Following the implementation of mitigation measures detailed in Section 5.6.2 above, the predicted impact on the geological and hydrogeological environment during the construction phase is ***neutral, imperceptible*** and ***long-term,*** the magnitude of impact is considered ***negligible***.

Visual Impact

Long term residual landscape effects will arise locally where the proposed extension to the existing Kildare Innovation Campus and the proposed pedestrian / cycle bridge will be physically located. The alteration and transformation of the existing campus will intensify the inherent light industrial landscape character within the site, leading to an increase and densification of the light industrial buildings replacing sections of existing open green space and lead to the addition of infrastructural elements in the curtilage of The Wonderful Barn area. The magnitude of landscape change is considered medium and the resulting significance / quality is moderate / beneficial. The alteration and redesign of the open space, and the proposed screen planting will improve biodiversity and the overall strength of the landscape layout as the vegetation matures, which will reduce the significance of landscape effects to minor / neutral.

Residual visual effects will concentrate along the adjacent road network to the east and south (R404) and in available views from the area around The Wonderful Barn where the proposed pedestrian / cycle bridge will be visible, as well as from the elevated viewing location at the top of The Wonderful Barn. The proposed landscape mitigation measures will integrate the Proposed Development into its setting reducing the significance of residual visual effects. This includes the view from the top of The Wonderful Barn where the proposed extensive new planting within the Kildare Business Park will reduce views of sections of buildings as the planting matures. The overall character of the view from the top of The Wonderful Barn will remain similar.

Major accidents and/or disasters

This assessment has identified the potential for major accident hazards to occur. These scenarios can have significant consequences; however, the likelihood of these events occurring is low due to engineering and operational safeguards that will be implemented at the development. The Land Use Planning Assessment concluded that the risk contours do not extend off-site; therefore, there are no impacts to off-site receptors. Refer to the Land Use Planning Assessment prepared by AWN and submitted with the application for further detail.

Notwithstanding this the major accident hazards for the proposed development are presented in Table 17. 4 and the natural disaster hazards are presented in Table 17. 5. The approach to identifying and quantifying risks associated with the proposed development by means of a sites specific risk assessment is derived from the EPA Guidelines on information to be contained in EIAR (EPA, 2022). The likelihood and consequence ratings for all identified major accidents or natural disasters are combined to form a risk score for risk evaluation.

Among the identified potential major accidents are fires, explosions from vapour cloud explosions (VCE) and Major Accidents to the Environment (MATTE) caused by unplanned release of diesel or other substances stored on site. In terms of Natural Disasters, chapter 17 includes an assessment of the risk from extreme weather or flooding.

When mitigation is accounted for the risk score associated with all identified potential major accidents or natural disasters are within the 1-6 range and are thus considered low level risks.

5.12 Difficulties Encountered

There were no difficulties encountered when preparing this chapter.

5.13 References

- Census 2011
- Census 2016
- Census 2022 (preliminary results)
- CSO Live Register
- The Economic and Social Research Institute's (ESRI) Quarterly Economic Commentary (Winter 2023)
- The Department of Health's latest policy report *Health in Ireland: Key Trends 2023*
- Grant Thornton Economic Impact Assessment (2023) (accompanies this EIAR)
- Homes & Communities Agency, UK Government Agency (2015), Employment Density Guide (3rd Edition)

6.0 BIODIVERSITY

6.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared by Ecology Ireland Wildlife Consultants Ltd (Ecology Ireland). It describes the habitats, flora and fauna present in the receiving environment and presents an assessment of potential impacts arising from the project, with consideration given to appropriate mitigation measures to minimise and/or avoid potential negative impacts. In this chapter, impacts arising from the project are assessed. The project comprises both the proposed development which is subject to the development consent being sought from Kildare County Council, and the proposed facilitation works *i.e.,* the uprating of existing Eirgrid transmission lines and the GNI upgrade works. Refer to **Chapter 2** for a more detailed description of the proposed development and the proposed facilitation works.

This Biodiversity Chapter has been prepared using 'Guidelines on the Information to be contained in Environmental Impact Assessment Report (EIAR)' (EPA 2022).

The main objectives of this Biodiversity Chapter were to:

- Undertake a detailed desktop review of available ecological data of the study area, including a review of designated nature conservation sites in the wider hinterland.
- Complete ecological field surveys in order to obtain information on the baseline ecology of the study area.
- Evaluate the ecological importance of the ecological resources of the study area.
- Assess potential impacts on the existing ecology that could arise from the proposed development.
- Develop avoidance and mitigation measures, to eliminate or reduce potential negative impact(s) on the ecology of the receiving environment arising from the proposed development.

6.1.1 Statement of Authority

Dr. Gavin Fennessy is a highly experienced ecologist with 25 years of experience in consultancy. He is Principal Ecologist and Managing Director of Ecology Ireland Wildlife Consultants Ltd. He is a member of the Irish Policy Group of the CIEEM and is a guest lecturer at University College Cork. He and his team have prepared numerous ecological impact assessments, for all types of projects and plans throughout Ireland. Gavin is an expert in ornithology and terrestrial mammals. He has provided input into Oral Hearings as a specialist ecologist for almost 20 years. He is the retained expert on management of wildlife hazard at Dublin Airport and had spoken at a number of international conferences in relation to bird collision risk.

John Deasy is an ecological consultant with experience across a range of disciplines including botanical and habitat surveys, bird surveys, mammal surveys and protected invertebrate surveys. He has nearly 10 years of experience as a professional ecologist and has undertaken a range of botanical and habitat surveys including baseline surveys for renewable energy projects, shared-use greenways and domestic and commercial properties. These surveys have included non-native invasive species surveys, rare species surveys and evaluations of habitats listed on Annex I of the EU Habitats Directive. John holds an MSc. in Ecological Assessment

and a BSc. in Earth and Environmental Science from University College Cork. He is a member of the Botanical Society of Britain and Ireland.

Marie Kearns (BSc MSc) has almost 5 years of professional experience in ecological surveying, ecological impact assessment and the appropriate assessment process. She has worked on projects related to renewable energy, infrastructure, housing, quarries and various other development projects. She is an experienced field ecologist with a diverse ecological survey profile, including habitats and flora, marine and terrestrial mammals, and birds. She has held NPWS Licenses for photographing wild animals. Marie is also experienced in producing maps and visualising biological datasets using QGIS.

Athena Michaelides (BSc Zoology & Animal Biology) has over five years of experience as a professional ecological consultant. She is a former secretary of the Irish Wildlife Trust with particular experience in field surveys and reporting as part of Ecological Impact Assessments. Athena formerly was employed by Ryan Hanley Consulting Engineers and now works as an independent ecologist.

Seán Dundon graduated with a BSc in Wildlife Biology from ITTralee. He has over five years of experience as a wildlife and environmental ranger for a large industrial facility. Seán is an accomplished field ecologist, skilled in both bird surveys and mammal surveys. He was the principal author of a large-scale 5-year Biodiversity Management Plan (BMP). He has directly managed a number of diverse protected habitats and liaised with governing bodies such as the NPWS.

Fiona May Aylward (BSc Ecology & Conservation) has two years of experience as a consultant ecologist. She has developed a range of field identification skills over nearly a decade of volunteer work and field courses. Fiona is a professional horticulturist and has run community-based projects on organic food production. Fiona worked as part of the field team carrying out ground-based assessments of trees for their bat roost potential and assisted in the bat emergence surveys at the site in 2023.

6.1.2 Site Description and Context

The proposed development site is located within the townlands of Parsonstown, Rinawade Lower, Rinawade Lower, and Barnhall in Co. Kildare. The *c.* 72.2ha site primarily encompasses lands within the existing Kildare Innovation Campus, which was formerly named the Hewlett Packard Campus, originally permitted in 1995 under KCC Reg. Ref 95923 (See Figure 6-1). Leixlip town is located directly north/northeast and Celbridge town located *c.* 1km to the southwest.

The campus is bordered by Celbridge Road (R404), a portion of which is within the proposed development site boundary, to the east and bordered by the M4 motorway to the north. Castletown House and associated grounds are located to the west and includes areas of woodland habitat, a band of which borders the western boundary of the campus. Barnhall Rugby Football Club and the recently completed DB Schenker logistics facility are located to the south of the campus. The proposed development site also includes lands located north the campus. These lands to the north are within the Wonderful Barn Demesne, situated between the M4 motorway to the south and the Wonderful Barn allotments and Barnhall Meadows, an existing residential housing development, to the north.

Kildare Innovation Campus is made up of an existing group of 9 no. industrial buildings, car parking areas, and access roads that are used by *c.* 1100 staff in industries including manufacturing, office, distribution, welfare and utilities. An existing 110 kV substation

(Rinawade Substation), which provides electricity to the campus is located in the northwest of the campus site. Highly managed areas of amenity grassland, parkland, and ornamental planting immediately surround the campus. Areas of young broadleaved woodland and managed treelines mark the boundary of the campus site and provide screening. The campus site also contains areas of semi-natural habitat that are subject to low intensity management including meadow and wet grassland areas, mature treelines and hedgerows, and developing scrub habitat.

The proposed GNI upgrade works will be carried out along a total distance of *c*. 1.5km. The route will start on Station Road, turning south and continuing down Old Hill Road/Celbridge Road before turning west into the north lands, within the proposed development site boundary, to the north of the M4. The route will cross the M4 south into the campus, connecting to a new gas skid installed at the existing gas skid location. The existing gas skid will be decommissioned and removed.

The proposed Eirgrid uprating works, as outlined in **Chapter 2– Description of the Project**, will require the replacement of overhead transmission lines and pole sets and review/upgrade of the double circuit towers and angle towers connecting Maynooth to Rinawade (Stage 1), Dunfirth/Kinnegad to Rinawade (Stage 2), Statcom (Stage 3), Derryiron to Maynooth (Stage 4), Derryiron – Kinnegad (Stage 5).

Both the proposed development site and the proposed GNI upgrade route are located within the Liffey and Dublin Bay catchment in Hydrometric Area 09 (sub-catchment: Liffey_SC_080). The Kilmacredock Stream which originally flowed through Kildare Innovation Campus has been diverted to flow around the main part of the campus and is completely culverted within the proposed development site boundary (See Engineering Services Report Drainage and Water Services report, CSEA (2023a)). The Kilmacredock Upper Stream flows through the 1.5m culvert into the Leixlip Reservoir, to the southeast of the proposed development site, which is located *c*. 60m from the proposed development site boundary at its nearest point. Two attenuation ponds (with an additional fire water retention pond) are located in proximity to the southeast boundary of the campus site surrounded by a mix of bankside vegetation and scrub. The ponds attenuate water from the campus and release runoff into the adjacent Leixlip Reservoir via an underground culvert crossing the Celbridge road to the east of the proposed development site. The existing foul water drainage network servicing Kildare Innovation Campus connects to the local municipal sewerage network where wastewater streams drain by gravity to the Kildare County Council sewer and is treated within Leixlip Wastewater Treatment Plant (WWTP) where the primary emission point is located in the River Liffey upstream of Leixlip Reservoir and the proposed development site. The River Liffey flows northwest through the Leixlip Reservoir, discharging from the Leixlip Dam before continuing west and ultimately flowing out to Dublin Bay. Under the Water Frameworks Directive (WFD), the reaches of the River Liffey flowing into and out from the Leixlip Reservoir are considered to be of "Good" status with a risk status currently "Under Review", while the Leixlip Reservoir is of "Poor status"[1]. The proposed GNI upgrade route does not cross any watercourses.

6.2 Project Description

Refer to **Chapter 2 – Description of the Project** for a more detailed project description and the Construction and Environmental Management Plan (CEMP) for a description of site preparation and construction works.

[1] https://gis.epa.ie/EPAMaps/

The project, subject to this EIAR includes two separate but interrelated streams of proposed works:

A. The 'principal' works subject to the development consent being sought from Kildare County Council, i.e. the proposed development; and
B. 'Facilitation works' required to support the development which do not form part of the development consent being sought from Kildare County Council. The facilitation works include a mix of works that will be required to be undertaken for or on behalf of statutory undertakers such as Gas Networks Ireland and EirGrid.

The proposed development will include for the demolition of some of the existing buildings on site and construction of new buildings, an energy centre and replacement substation. The proposed development will include significant public infrastructure including a new signalised intersection on Celbridge Road (R404), a new Public Link Road through the campus (between Barnhall Road and the new signalised intersection), a pedestrian/cycle overpass of the M4, pedestrian and cycle links through the site and along the designated protected view corridor and supporting infrastructure.

The project will be developed across three phases, which is displayed in the Phasing Layout in Section 2.6. Further details including the phasing programme and detailed demolition and construction works can be found in **Chapter 2** and within the Construction and Environmental Management Plan (CSEA (2023b) which is submitted as part of the planning application.

Phase 1 will comprise the development of Building A1 (Deep Tech) with associated carparking, landscaping, services yard etc. The existing buildings Nos 1-6 will be retained and operated as currently. No works are proposed to these buildings. Building B1 (Data Centre) will be constructed fully in Phase 1 but will only utilise 16MW power. Power to the building will ramp up to a c. max of 32MW during Phase 3 of the development. The new replacement 110kV Substation will be developed adjacent to the existing 110kV Substation. Once the new replacement substation becomes energised, the existing 110kV substation will be decommissioned. Associated grid diversion to the new substation will also be included in Phase 1. The energy centre will be delivered in phases to align with power demand for the site and dispatchable energy requirements of the grid. The initial phase of the masterplan will include the provision of 1 no. CTG powered by the enhanced gas line to the site. Supporting infrastructure within the energy compound will also be provided. A Public Link Road connecting the R449 Barnhall Road to the R404 Celbridge Road with a new signalised intersection at the R404 will be constructed. The existing signalised intersection will be removed, and road and access reinstated. The M4 Pedestrian and Cycle Overpass including links to the entrance of Barnhall Meadows estate and the connections along the protected view line will be developed. An Electric Bus Charging Hub will be constructed providing parking and charging for 10no. privately operated buses. Modifications to the existing parking lots 1 and 2 to increase the parking provide and include EV and accessible stalls. Hard and soft landscaping will be provided throughout the Phase 1 area as well as the required earthworks, drainage, services, utilities and new gas skid. Phase 1 is expected to take *c.* 2.5-3 years between 2024 and 2027.

Phase 2 will comprise the development of Building A2 (Deep Tech) with associated carparking, landscaping, services yard etc. Hard and soft landscaping will be provided throughout the

Phase 2 area, including the required drainage and services. Phase 2 is expected to take *c*. 1.5-2 years between 2026 and 2028.

Phase 3 will comprise thedemolition of Existing Buildings No. 7, 8 and 9 including associated Data Centre Buildings C1, C2 & C3 with associated parking, landscaping, building services, *etc*. The Energy Centre final phase will align with power demand for the balance of the site and dispatchable energy requirements of the grid. The third phase of the masterplan will include the provision of 8no. turbines powered by a local extension of the gas transmission network by GNI. The turbines will be capable of operating off biogas as well as natural gas and will be located within 14m high enclosed area.

The existing campus road which provides entrance from the Celbridge Road roundabout and access to DB Schenker will be extended and linked up with the internal campus road adjacent to the view corridor. All associated cycle paths and footpaths will be linked up infrastructure will be demolished to make way for the build out of Phase 3. Hard and soft landscaping will be provided throughout the Phase 3 area, including the required drainage and services.
Phase 3 is expected to take *c*. 6-7 years between 2028 and 2035.

In addition, the proposed development will have 9 combustion turbine generators (CTGs) and 80 back-up generators. The back-up generators will provide power in the event of an interruption to the supply of power from the National Grid. The fuel for the generators will be stored in individual, double-skinned storage tanks. The proposed development is committed to the use of HVO as a back -up fuel supply for the generators over diesel. The energy centre will have its own HVO bulk storage of c. 3440 tonnes.

The project to which this EIAR relates also includes 'facilitation works' which comprise uprating of existing 110kV power lines to the site and the proposed upgrade of a GNI gas transmission line to the site.

Upon completion of Phase 1 of the KIC Masterplan, including the development of the proposed replacement 110kV Substation, uprating of existing overhead lines from the replacement 110kV Rinawade substation to Derryiron/Maynooth and Dunfirth/Kinnegad will be required to facilitate build out of Phase 3 of the KIC Masterplan. The proposed uprating will be carried out to existing lines along established wayleaves, utilising existing infrastructure (existing access roads/tracks, existing poleset/tower foundations, etc.).

For the proposed GNI upgrade route, *c*. 1.18km of the route will be installed within public roads under existing blacktop, with *c*. 0.14m of the route installed within the lands north of the M4 comprising a haul road that is under construction at the time of this report, and meadow grassland. From the lands north of the M4, the route will cross beneath the M4 south into the campus via Horizontal Directional Drilling (HDD) process (*c*. 0.18km). The proposed HDD process will avoid tree removal, with all works to occur outside Root Protection Areas (RPA). The proposed HDD route will be below the RPA of any trees within the north lands and within the campus (minimum 1m depth). The launch pit for the HDD will be adjacent to the haul road which currently comprises a brownfield site. The exit pit will be directly adjacent to the temporary site compound within the campus. The preferred route for the proposed GNI upgrade works is shown in Figure 6-2. The proposed upgrading works will follow the methodologies and environmental requirements set out in the GNI Construction Environmental Management Plan, an example of which can be seen in Appendix 6.1. This will include measures for the protection of water quality including:

- The site compound shall be supplied with temporary toilet facilities and there will be welfare facilities at designated onsite. There shall be no discharges to water from these facilities.
- Concrete pours will be avoided during extreme heavy rainfall events. Washout of concrete lorries will not be permitted.
- Spoil from excavations will be removed from site on a regular basis, to prevent build-up of material and reduce the potential for silt run off.
- All spillages will be cleaned up immediately and associated wastes disposed of accordingly. Spill containment material/equipment shall be stored at all work areas for use in the event of an emergency. There will be an abundance of absorbent material available for use in the event of an environmental emergency (sand & soil).
- Water will not be extracted or pumped from local water sources (rivers, streams, etc). There will be no discharges to local surface waters.
- Environmental inspections shall carry out shall include visual inspection of works near watercourses, culverts, dry ditches etc. as well as water discharges from any work areas. Significant environmental findings shall be communicated to the Environmental Officer for corrective and preventive action.

As outlined in **Chapter 2 – Description of the Project,** the facilitation works which are included in the project do not form part of the development for which consent is sought. Future consents for the facilitation works will be required through EirGrid and GNI.

6.2.1 Surface-Water Drainage Network

As outlined in Section 6.1.2 above, **Chapter 8 - Hydrology**, and the Engineering Services Report Drainage and Water Services (CSEA, 2023a), the existing surface-water drainage network servicing Kildare Innovation Campus flows into the existing attenuation ponds before discharging to the Leixlip Reservoir and the River Liffey. There are no uncovered watercourses within the proposed development site. The Kilmacredock Stream flows beneath the site along a diverted path through a 1.5m culvert before entering Leixlip Reservoir. The existing surface-water drainage network discharges to the ponds and does not discharge directly to the culverted Kilmacredock Stream. Discharge from the ponds is released following confirmation of water quality through electronic monitoring mechanisms inclusive of shut-off valves, upstream of the existing attenuation ponds near the existing site entrance off the Celbridge Road. The culverted Kilmacredock Stream and surface-water run-off from the attenuation ponds discharge from the proposed development site at the same point in the surface-water run-off system, just prior to exiting the site to the east, before ultimately discharging to the Leixlip Reservoir (See Drawing 21_048 - CSE - ZZ - ZZ - DR - C – 2100).

For the proposed development, the surface-water drainage network will be re-designed in order to accommodate the increase (*c.* 171,641.88 m^2) in hardstanding area (See Drawing 21_048 - CSE - ZZ - ZZ - DR - C – 2110). For the proposed surface-water drainage system, the proposed development site has been divided into five catchment areas where the surface-water run-off from each catchment is attenuated within its own pond and/or wetland area. This will require the installation of 2 No. attenuation basins (2,993.3m^3), 2 No. attenuation ponds (13, 347.7m^3) and 1 No infiltration basin (1093.8 m^3), as well as the retention of the 2 no. existing attenuation ponds & 1 no. firewater pond. Each catchment will release water to the two existing attenuation ponds, and the surface-water drainage network for the proposed development will continue to discharge from these ponds to Leixlip Reservoir and the River Liffey. Refer to CSEA's Engineering Services Report Drainage and Water Services (CSEA, 2023a) for more information.

Along with the redesign of the surface-water run-off management system to service the proposed development site during the operational phase, it is proposed to redesign the culvert as part of the proposed scheme. The proposed culvert will then be fully constructed except for the tie-in locations to the existing culvert. Once the proposed culvert is constructed, cleaned, and inspected the tie-in locations to the existing culvert will be completed. This will ensure minimal operational disturbance to the existing infrastructure. Once the existing water course has been diverted through the new route, the existing culvert will be removed. The proposed diverted culvert will be *c*. 360m in length, located c. 90 south-west of the existing culvert. The work will be achieved over 8 weeks. The proposed design of the culvert will ensure that there is no reduction in the hydraulic capacity of the culvert and no resultant increase in flood risk. As outlined in the CEMP (CSEA, 2023b), the proposed culvert will be constructed prior to the decommissioning of the existing culvert, ensuring minimal operational disturbance of the existing infrastructure.

6.2.2 Foul Water Drainage Network

The existing foul water drainage network connects to the municipal sewerage network and is ultimately treated at Leixlip WWTP (Lower Liffey Valley Regional Sewerage Scheme – D0004) (See **Chapter 8 – Hydrology**, for more information). As part of the proposed development, the existing foul pumping stations will be retained and upgraded where necessary, with underground 24-hour storage tanks to be provided at each of the existing stations. The existing foul water drainage network will be realigned to accommodate the proposed development and will collect domestic foul water from the administration block of the proposed Data Storage Facilities, the Deep Technology Buildings, Energy Centre and the 110kV substation (21_048 - CSE - ZZ - ZZ - DR - C – 2210). There are no new requirements for new foul connections outside of the overall landholding. There are no proposed process water emissions as part of the operational phase of the proposed development. Leixlip WWTP discharges treated wastewater at the primary emission point into the River Liffey, upstream of the proposed development site and Leixlip Reservoir. Therefore, there is a hydrological link between the proposed development and the aquatic environment downstream of Leixlip WWTP primary emissions point.

6.2.3 Landscaping

Throughout the three phases, hard and soft landscaping is to be provided throughout the proposed development site. A Landscape Architectural Master Plan has been produced for the proposed development site (AECOM, 2023). As part of the landscaping plan, the All-Ireland Pollinator Plan (2015-2020) and the National Biodiversity Action Plan (2021-2025) were consulted as part of the development of the planting scheme for the development site.

In order to facilitate the proposed development, over 1900m of hedgerow/treeline and 9,200m^2 of woodland will be permanently removed. Replacement planting for the hedgerows will include native whips and feathered mix comprising species such as Blackthorn (*Prunus spinosa*), Hawthorn (*Crataegus monogyna*), Whitebeam (Sorbus aria), Hazel (*Corylus avellana*) and Holly (Ilex a*quifolium*). Woodland planting will include additional species such as Oak (*Quercus* sp.), Rowan (*Sorbus aucuparia*), and Birch (*Betula pendula*) with specimen trees such as Oak, Scot's Pine (*Pinus sylvestris*), Willow (*Salix* sp.), and Alder (*Alnus glutinosa*) proposed to be planted in their semi-mature form throughout the proposed development site via transplant. 155,300m^2 of grassland within the proposed development site will comprise of pollinator friendly habitat, seeded with the All-Ireland Pollinator Plan Wildflower Mixture (GF03) or an approved alternative mix. Existing hedgerows and treelines that are being retained as part of the proposed development will be bolstered where necessary with native tree species such as Hawthorn, Blackthorn, Alder and Willow. Retained tree and hedgerow

protection measures will be in place as laid out in the arborist's report (Charles McCorkell, 2023).

As outlined in the Engineering Services Report Drainage and Water Services (CSEA, 2023a) the surface-water management system will include the installation of 2 No. attenuation basins, 2 No. attenuation ponds, and 1 No infiltration basin within the proposed development site. As part of the landscaping plan, the ponds will be seeded with marginal pond planting. The basin areas and the areas surrounding the ponds will also be seeded with wetland wildflower mix.

See Drawing KIC-ACM-XX-XX-DR-LA-1000, for the detailed list of planting species.

Figure 6-1 Site location Map.

Figure 6-2 Map of the preferred route for the proposed GNI upgrade works

6.3 Methodology

This ecological assessment has been prepared for the project following detailed multi-season ecological surveys of the study area (*i.e.,* the existing campus and lands to the north). A thorough desktop review of available ecological information for the study area, the proposed GNI upgrade route and the wider environment was also completed. The proposed GNI route was surveyed for invasive species. The proposed Eirgrid uprate works were primarily assessed by a desktop review of aerial mapping and available sources of ecological data, with no dedicated ecological field surveys undertaken. The survey schedule is summarised in Table 6-1.

Date	Time	Weather	Ecologist	Task
28.04.2022	10:00-16:00	Wind F2-F3, Dry, Visibility Good	Dr. Gavin Fennessy	Deployment of passive detectors and cameras, bird transect survey, mammal survey. Inspection of Buildings 7, 8 and 9 for bat roost suitability
08.06.2022	10:00-16:00	Wind F3-F4, Dry, Visibility Good	Dr. Gavin Fennessy	Deployment of passive detectors, bird transect survey, mammal survey.
09.06.2022	10:00-16:00	Wind F2-F3, Light showers, Visibility Good	Dr. Gavin Fennessy	Deployment of passive detectors, mammal survey.
14.06.2022	07:00-08:00	Wind F3, Overcast, Dry, Visibility good	Dr. Gavin Fennessy	Ecological site walkover, mammal survey.
16.06.2022	11.15 - 19.30	Overcast, Dry, Wind F2/3 SE, Visibility Good	John Deasy	Baseline ecological survey for habitats and botanical species.
27.06.2022	12:00-16:00	Wind F4, Infrequent showers, Visibility Good	Dr. Gavin Fennessy	Collecting passive detectors and cameras, mammal survey.
10.08.2022	12:00-16:00	Bright, Wind F2-F3, Dry, Good Visibility	Dr. Gavin Fennessy	Collecting passive detectors, mammal survey.
30.11.2022	12:00-16:00	Wind F2-F3, Dry, Good Visibility	Dr. Gavin Fennessy	Bird transect survey
01.02.2023	10:00-16:00	Strong breeze, Wind F4, Dry, Good Visibility	Dr. Gavin Fennessy	Bird transect survey, ecological site walkover of the north lands (Wonderful Barn)
28.03.2023	10:30-16:00, 20:45-21:15	Overcast, Cloud 8/8, Wind F2, Occasional Light Showers, Visibility Good	Dr. Gavin Fennessy, Marie Kearns, Fiona May-Aylward	Preliminary ground level roost assessment - trees, bat activity survey, deployment of passive detectors
29.03.2023	10:00-13:00, 19:35-21:15	Bright and Breezy, Dry, Cloud 6/8, Wind F3/F4, Visibility Good	Dr. Gavin Fennessy, Marie Kearns, Fiona May-Aylward	Preliminary ground level roost assessment - trees, dusk emergence survey, deployment of passive detectors

Date	Time	Weather	Ecologist	Task
30.03.2023	12:00-16:00	Warm and Bright, Cloud 6/8, Wind F2/F3, Occasional showers	Dr. Gavin Fennessy, Marie Kearns, Fiona May-Aylward	Preliminary ground level roost assessment - trees, deployment of passive detectors
13.04.2023	11:00-12:00	Wind F4-F5, Bright, Dry, Good Visibility	Dr. Gavin Fennessy	Site walkover as part of the KIC pre-planning meeting
19.05.2023	1600-17:00	Dry, Cloud 6/8, Wind F3, Good Visibility	Dr. Gavin Fennessy	Ecological survey of the proposed GNI upgrade route – check for invasive plant species.

Table 6-1 Baseline field assessment details.

The methodology employed in the carrying out of this ecological assessment is outlined below.

6.3.1 Desktop Review

A desktop review of relevant data available for the study area, the proposed GNI upgrade route and the Eirgrid uprating route was undertaken for the assessment and published data on designated and/or ecologically sensitive sites, habitats and species of interest in the vicinity of the study area proposed GNI upgrade route were consulted. The following datasets and ecological resources were consulted:

- National Parks and Wildlife Service (NPWS) online mapping and datasets;
- Heritage Maps online mapping;
- National Biodiversity Data Centre (NBDC) online mapping and datasets;
- Environmental Protection Agency (EPA) online mapping and datasets;
- Botanical Society of Britain and Ireland (BSBI) online mapping;
- Kildare County Development Plan 2023 – 2029;
- Leixlip Local Area Plan 2020-2023;
- Celbridge Biodiversity Action Plan 2021 – 2025;
- National Biodiversity Action Plan 2017 - 2021;
- National Biodiversity Action Plan 2023 – 2027 (Draft for Public Consultation);
- Invasive Species Ireland;
- Other information sources and reports footnoted or referenced.

The study area lies within the 10km grid square, N93, and the 2km grid square, N93X. The majority of the proposed GNI upgrade route lies within the 2km grid square N93X, but also partially overlaps with the 2km grid squares N93Y, O03C and O03D. The proposed Eirgrid uprating route crosses the following 10km grid squares: N53, N63, N73, N83, O03, N93 and N54, N84, N94. Species records for these grid squares were downloaded from the NBDC database and outlined below in the relevant sections. Online aerial mapping and satellite imagery was used in conjunction with publicly available GIS files to generate mapping, which together, helped inform the desktop review.

Ecological reports commissioned by EFIV Irish Property ICAV for the development of the DB Schenker site, a logistics warehouse with ancillary office accommodation development, were consulted for information regarding previous habitat, botanical and faunal surveys. The DB Schenker site is located directly southwest of the study area. Reports consulted included the **Appropriate** Assessment Screening report (Environmental Resources Management Ltd, 2020a), the Ecological Impact Assessment Report (Environmental Resources Management

Ltd, 2020b), the Botany Survey report (Envirico, 2020), and the Pre-Construction Ecological Advice & Monitoring report (Ecology Ireland, 2022).

6.3.2 Designated Conservation Sites

Designated nature conservation sites within the wider hinterland of the project site were identified through a desktop review and by GIS analysis. Nature Reserves and Refuges for Fauna are protected under the Irish Wildlife Acts (1976-2010). Designated conservation sites include national sites, Natural Heritage Areas (NHAs) and Proposed Natural Heritage Areas (pNHAs). While NHAs are legally protected by the Irish Wildlife Acts (1976 - 2010), pNHAs are not.

SACs and SPAs are European designated nature conservation sites that have been designated under the EU Habitats Directive (92/43/EEC) and the EU Birds Directive (2009/147/EC) respectively. SACs and SPAs, along with candidate sites of Community importance, sites of Community importance, candidate SPAs and candidate SACs, are collectively known as Natura 2000 sites and are legally protected by Irish law. Nature Reserves and Refuges for Fauna are protected under the Irish Wildlife Acts (1976 - 2012). Many designated conservation sites overlap, for example an area can be designated as both an NHA and as a SAC and/or SPA or both.

In the subsequent analysis of designated sites, particular attention was made on sites where a potential receptor zone of influence exists with the project site. In other words, designated sites that may have a link to the project site (*e.g.* through hydrological link, overlapping, proximity) were focused on in this assessment.

A screening assessment in support of the Appropriate Assessment process has been prepared and submitted as part of this planning application.

6.3.3 Habitat and Botanical Assessment

A desktop review of botanical data available for the study area, the proposed GNI upgrade route and the proposed Eirgrid uprating route was undertaken. The National Biodiversity Data Centre (NBDC), Botanical Society of Britain and Ireland (BSBI) and National Parks and Wildlife Service (NPWS) online databases and mapping services were consulted to identify any rare or protected botanical species located within the relevant national 10km and 2km grid squares surrounding the project site.

The habitat and botanical assessment was carried out with due regard to best practice guidance (Smith *et al.* 2011). The survey involved a walkover of the study area where the habitats present were classified to level three using the classification scheme presented in *A Guide to Habitats of Ireland* (Fossitt, 2000). The extent of habitats was recorded on a field map along with notes of species present and their relative abundance described using the DAFOR scale. In addition, any other observations of interest (*e.g.* invasive plant species, *etc.*) were recorded using a Garmin eTrex10 GPS handheld unit. Evaluation of the habitats present in terms of their ecological value was assessed using the Biodiversity Evaluation Scheme presented in Appendix 6.2 (amended National Roads Authority 2009 scheme to include watercourse/aquatic evaluation elements from Nairn and Fossitt, 2004).

The conservation status of habitats and botanical species was also considered. The conservation status of habitats and botanical species within Ireland and Europe is indicated

by inclusion in one or more of the following: Irish Red Data Book for Vascular Plants (Wyse Jackson *et al.* 2016); Flora (Protection) Order 2022 and the EU Habitats Directive (92/43/EEC).

6.3.4 Fauna Assessment

The NPWS and NBDC online databases were consulted to identify any rare or protected faunal species historically recorded within the relevant national 10km and 2km grid squares overlapping the project site. In addition to records of rare/protected fauna, the NBDC website also hosts the Model of Bat Landscapes for Ireland, which has assessed the relative importance of landscape and habitat associations for bat species across Ireland (see Lundy *et al.* 2011). The landscape resource value for bats surrounding the study area, the proposed GNI upgrade route and the proposed Eirgrid uprating route was therefore assessed.

6.3.4.1 Non-Volant Mammals

Mammal surveys within the study area were undertaken by Dr. Gavin Fennessy (See Table 6-1 above). Surveys included a walkover of the proposed development site, identifying mammal species or signs of mammal activity seen (*e.g.*, droppings, tracks, burrows *etc.*) and recording observations using field notes and/or a handheld GPS unit. Techniques used to identify mammal activity followed recognised guidelines (*e.g.*, Clark 1988, Sutherland 1996, Bang & Dahlstrom 2004 and JNCC 2004).

In addition, digital trail cameras (Camera-traps) which take photographs and/or video when triggered by heat or motion, were also deployed to record mammal activity within the study area. In total, six trail cameras were erected throughout the study area, between April and June 2022 (See Table 6-2 below). The locations of equipment deployed is shown in Figure 6-3.

The conservation status of mammal species was considered. The conservation status of mammals within Ireland and Europe is indicated by inclusion in one or more of the following: Irish Wildlife Acts (1976 - 2010); Red List of Terrestrial Mammals (Marnell *et al.* 2019); EU Habitats Directive.

Camera Name	Start Recording	End Recording	Recording Days	Location (ITM)
Cam1	28/04/2022	08/06/2022	41	698750 734954
Cam2	28/04/2022	04/06/2022	37	699133 734577
Cam3	28/04/2022	08/06/2022	41	699125 734583
Cam4	28/04/2022	08/06/2022	41	699025 734615
Cam5	28/04/2022	06/06/2022	39	699138 734574
Cam6	28/04/2022	12/05/2022	14	699171 734556

Table 6-2. Trial Camera Deployment Detail

6.3.4.2 Bats

Bat surveys were completed at the study area between April 2022 and March 2023. The following surveys were completed:

- Passive Detector Surveys

- Building Inspections
- Ground Level Roost Assessments – Trees
- Active & Emergence Surveys

Due regard was taken of best practice guidelines outlined in Collins 2016 and Kelleher & Marnell 2006. Passive detector surveys were completed by deploying Wildlife Acoustics SMMini and SM4BAT detectors with the data from these detectors subsequently analysed using Kaleidoscope Pro (v. 5.4.9) software. Active and dusk emergence bat survey monitoring was carried out using the following bat detectors: Pettersson D240x outputting to Roland Edirol R01 Digital Recorder, Wildlife Acoustics SM4BAT, and a Magenta Bat4 bat detector. Calls recorded by the Pettersson D240x and SM4BAT detectors were analysed in Kaleidoscope Pro. Calls picked up by the Magenta Bat4 were identified and the species recorded during the surveys. The deployment location of the passive detectors and the monitoring locations for the active and dusk emergence surveys are shown in Figure 6-4 and Figure 6-5.

In total, 14 passive bat detectors were deployed throughout the study area between April 2022 and March 2023, see Table 6-3 for the complete deployment detail. Eight of the detectors (BD1 – BD8) were deployed around the study area in April 2022 and June 2022. They were deployed in locations likely to attract bat activity such as along treelines, hedgerows and in the vicinity of the ponds. Bats forage and commute using hedgerow corridors and woodland and the ponds are likely to attract foraging bats. Three of the detectors (BD9 – BD11) were deployed within the buildings proposed to be demolished (7, 8 & 9) for three nights in March 2023 in order to record potential roosting activity. A further three detectors (BD12 – BD14) were deployed on trees assessed as having roosting potential for bats in March 2023 in order to support the active and emergence surveys.

Inspections of the buildings proposed to be demolished (7, 8 & 9) were carried out on the 28th of April 2022. These inspections involved a visual assessment the interior and exterior of each building in order to check for locations with roosting potential and access points that would allow for the movement of bats in and out of the buildings. These buildings were also inspected for signs of bat activity including droppings, scratch marks, fur or urine staining, invertebrate prey remains, bat corpses, audible daytime bat chattering, as well as direct observations of bats themselves.

A preliminary ground-level roost assessment survey of trees scheduled for removal was carried out on the 28th, 29th and 30th of March 2023. Prior to the survey, the tree felling schedule and map prepared by the arborist was consulted in order to determine the characteristics of the trees marked for removal, such as the species, maturity and location of the trees (See Tree Schedule, Charles McCorkell (2023) submitted with the planning application). The survey involved a visual inspection of the tree from ground-level to assess the presence of potential roost features (PRFs), or lack thereof, as well as evaluating any direct evidence of the presence of bats. The assessment survey was carried out during daylight hours, with binoculars used to inspect tall trees where PRFs could be present at a height, and where it was not possible to get close to trees due to barriers (*i.e.,* scrub, fencing).

An active bat survey was undertaken on the 28th of March 2023 between 20:35 – 21:20. This involved two ecologists monitoring areas of the campus for bat activity equipped with bat detectors and light torches. The buildings to be demolished were again inspected and passive detectors were deployed inside each of the buildings.

A dusk emergence survey was completed on the 29th of March 2023, which had two ecologists monitoring bat activity using bat detectors and light torches, at trees identified as having roost potential during the daylight preliminary ground-level roost assessment surveys. The dusk emergence surveys were carried out from *c*. 30 mins before sunset to *c*. 1 hour after sunset, between 19:30 – 21:15. All bat sightings were noted.

Detector Name	Start Recording	End Recording	Recording Nights	Location (ITM)
BD1	28/04/2022	08/06/2022	41	699174 734665
BD2	28/04/2022	10/06/2022	40	698723 734974
BD3	28/04/2022	10/06/2022	40	698523 734635
BD4	09/06/2022	10/06/2022	1	699196 735000
BD5	09/06/2022	10/06/2022	1	698471 734860
BD6	10/06/2022	07/07/2022	27	698365 735071
BD7	10/06/2022	07/07/2022	27	699020 734616
BD8	10/06/2022	07/07/2022	27	698915 735139
BD9	28/03/2023	31/03/2023	3	698915 734792
BD10	28/03/2023	31/03/2023	3	698973 734742
BD11	28/03/2023	31/03/2023	3	698727 734590
BD12	28/03/2023	31/03/2023	3	699182 734534
BD13	28/03/2023	31/03/2023	3	698560 735063
BD14	28/03/2023	31/03/2023	3	698562 734670

Table 6-3. Passive Detector Deployment Detail

6.3.4.3 Birds

The conservation status of bird species was assessed with reference to; EU Birds Directive (2009/147/EC) Annex I list and Birds of Conservation Concern in Ireland; (BoCCI) Red, Amber and Green list (Gilbert *et al,* 2021). On the BoCCI list; Red-listed species are of high conservation concern in Ireland, Amber-list are considered of medium conservation concern, while Green-listed species are not of conservation concern in Ireland at present. Bird species listed on Annex I of the EU Birds Directive are considered of high conservation concern across Europe.

Four dedicated bird transects (see Bibby *et al*. 2000) were surveyed at the study area, with two completed during the breeding season (28th April and 8th June 22) and two completed during the winter season (30th November 2022 and 1st February 2023), with the same transect routes repeated. The number of each bird species seen/heard within 100m of the transect were recorded. Where a species was only seen/heard at a distance over 100m, only the presence of that species, not the number. Care was taken to minimise double-counting individuals in general, with counts focused on adult birds only where possible in line with standard transect survey practices (*e.g.* Countryside Bird Survey). Transect locations are shown in Figure 6-6 below.

During all ecological surveys, all bird species seen or heard within the study area were recorded to form a casual species list, with a separate causal bird species list compiled during an ecological site walkover of the north lands on the 1st of February 2023. Any behaviours indicative of breeding or roosting within or in the vicinity of the study area were recorded.

6.3.4.4 Other Taxa

During all ecological surveys, observations of other taxa (amphibians, invertebrates, *etc.*) were recorded. The conservation status of other taxa was assessed by examining their inclusion in one or more of the following: Irish Wildlife Acts (1976–2010); Irish Red List for Butterfly (Regan *et al.* 2010); Irish Red List for Damselflies & Dragonflies (Nelson *et al.* 2011); Irish Red List for Amphibians, Reptiles & Freshwater Fish (King *et al.* 2011); Regional Red List of Irish Bees (Fitzpatrick *et al.* 2006); and the EU Habitats Directive.

Figure 6-3 Trail camera locations

Figure 6-4 Passive Bat Detector Locations

Figure 6-5 Active Bat Survey Locations

Figure 6-6 Dedicated bird transect routes

6.4 Results

6.4.1 Designated Conservation Sites

A nominal 15km zone, in accordance with NPWS guidance[2], is used as the initial search area and for the preparation of mapping of the designated sites in the wider hinterland of the development. However, the potential for effects on sites at larger distances are of course also considered as part of the initial assessment process, using the Source-Pathway-Receptor (SPR) model *i.e.*, where an aspect of a Natura 2000 site or 'Receptor' (*e.g.,* protected species or habitat) is potentially linked to the project. Examples of a link or 'Pathway' include a hydrological connection or use of a project site by protected species occurring outside the site boundary (*i.e.*, ex-situ).

In the event of any likelihood of potentially significant effects on any more distant Natura 2000 sites being identified these sites are included in the formal assessment process.

The proposed development site is not located within any designated Natura 2000 sites or nationally designated conservation sites. There are two Natura 2000 sites and ten pNHA sites located within 15km of the proposed development site boundary. There are an additional four Natura 2000 sites located outside of the 15km buffer but with a distant hydrological connection to the proposed development site as discussed below.

See Table 6-4, Figure 6-7 and Figure 6-8 for the locations of the designated conservation sites and the distance of the sites to the proposed development site. The closest designated site is the Rye Water Valley/Carton SAC which encompasses the Rye Water Valley/Carton pNHA and is located at a minimum distance of 960m to the north of the proposed development site.

Natura 2000 sites were also considered with regard to the proposed facilitation works *i.e.*, the proposed Eirgrid uprating works and the proposed GNI upgrade works.

Based on the information provided, it was determined that there are 13 no. Natura 2000 sites (12 no. SACs and 1 no. SPA) within 15km of the proposed Eirgrid uprating route. Of these Natura 2000 sites, the proposed uprating route crosses directly over the Rye Water Valley/Carton SAC, with the next nearest Natura 2000 site, The Long Derries, Edenderry SAC, located less than 5km from the proposed uprating route. Additionally, the Eirgrid uprating route crosses one NHA site, Carbury Bog NHA, and two pNHA sites, the Royal Canal and the Rye Water Valley/Carton. See Table 1 in Appendix 6.3 for the estimated distances of these sites to the proposed Eirgrid uprating route.

The preferred route for the proposed GNI upgrade works does not cross any designated Natura 2000 sites or nationally designated conservation sites. There are two Natura 2000 sites within 15km of the proposed GNI upgrade route, the closest being the Rye Water Valley/Carton SAC which is located 180m to the east and northeast. There are 10 no. pNHA sites within 15km of the proposed GNI upgrade route. See Table 2 in Appendix 6.3 for the distances of these sites to the proposed GNI upgrading route.

[2] https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf

The connection of the relevant Natura 2000 sites and their qualifying interests, to the proposed development site, proposed GNI upgrade route and proposed Eirgrid uprating route are discussed below. See Table 6-5 for an outline of the features of interest of the pNHA sites, where the site descriptions have been taken from the NPWS site synopses[3].

The likely significant effects on European designated sites arising from the proposed development are addressed in the accompanying Screening Assessment report in support of the AA process and summarised in Section 6.5.1 below.

Site Name	Site Code	Proposed Development Site Distance (km)
Natura 2000 sites		
Rye Water Valley/Carton SAC	001398	0.96
Glenasmole Valley SAC	001209	13.83
South Dublin Bay and River Tolka Estuary SPA	004024	18.33
South Dublin Bay SAC	000210	19.55
North Bull Island SPA	004006	21.46
North Dublin Bay SAC	000206	21.47
Nationally designated sites (no NHA sites within 15km)		
Rye Water Valley/Carton pNHA	001398	0.96
Royal Canal pNHA	002103	1.11
Liffey Valley pNHA	000128	1.30
Grand Canal pNHA	002104	2.60
Slade of Saggart and Crooksling Glen pNHA	000211	10.35
Lugmore Glen pNHA	001212	11.17
Kilteel Wood pNHA	001394	12.35
Dodder Valley pNHA	000991	13.21
Donadea Wood pNHA	001391	13.50
Glenasmole Valley pNHA	001209	13.83

Table 6-4 Distance from the proposed development site to designated sites in the wider area.

Rye Water Valley/Carton SAC

Rye Water Valley/Carton SAC is located approximately 0.96km from the proposed developments and c. 179m at a minimum distance from the preferred route for the proposed GNI upgrade works. The site is designated for; Petrifying springs with tufa formation (*Cratoneurion*) [7220], *Vertigo angustior* (Narrow-mouthed Whorl Snail) [1014] and *Vertigo moulinsiana* (Desmoulin's Whorl Snail) [1016].

As outlined in Section 6.1.2, the River Liffey is hydrologically connected to the proposed development site by the surface-water drainage system that releases run-off via controlled discharge to the Leixlip Reservoir and the foul water drainage network that discharges treated foul water to the River Liffey via the Leixlip WWTP primary emission point. The Rye Water River flows into the River Liffey *c*. 450m downstream of the surface-water discharge point in the Leixlip Reservoir and *c.* 1km upstream of Leixlip WWTP primary emission point. Given the location of the confluence of the River Liffey and the Rye Water River, it is considered that no elements of the proposed development are likely to result in significant impacts on the Rye Water Valley/Carton SAC.

The Eirgrid uprating works crosses the Rye Water River and therefore the Rye Water Valley/Carton SAC. The proposed works comprise the uprating of existing overhead lines with

[3] https://www.npws.ie/protected-sites/nha

no exaction works or in-stream works within the SAC required. The replacement of polesets and the upgrading of the towers, where required, will not occur within the SAC. Given the nature of the proposed works and the fact that no instream works for poleset/tower replacement works will be required within the SAC, no significant impacts to the Rye Water Valley/Carton SAC are likely.

The proposed GNI upgrade route does not cross the Rye Water River or any other watercourses. Given the urban nature of the intervening distance, along with the size/scale of the proposed GNI upgrade works, no significant impacts to the Rye Water Valley/Carton SAC are likely.

The facilitation works *i.e.*, the proposed Eirgrid uprating works and the proposed GNI upgrade works will be subject to a separate consent process including Appropriate Assessment.

Glenasmole Valley SAC

Glenasmole Valley SAC is located approximately 13.83km from the proposed development. The site is designated for; 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] and Petrifying springs with tufa formation (*Cratoneurion*) [7220].

Glenasmole Valley SAC is located southeast of the proposed development site and in a different sub-catchment. It is not hydrologically connected to the proposed development site, nor to the facilitation works routes; therefore, no significant effects are likely on this SAC.

South Dublin Bay and River Tolka Estuary SPA

South Dublin Bay and River Tolka Estuary SPA is located approximately 18.33km from the proposed development. The site is designated for; 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] and Wetland and Waterbirds [A999].

As outlined in Section 6.1.2, the River Liffey is hydrologically connected to the proposed development site by the surface-water drainage system that releases run-off via controlled discharge to the Leixlip Reservoir and the foul water drainage network that discharges treated foul water to the River Liffey via the Leixlip WWTP primary emission point. The River Liffey ultimately flows into Dublin Bay which makes up part of the South Dublin Bay and River Tolka Estuary SPA. A distant hydrological connection between South Dublin Bay and River Tolka Estuary SPA and the proposed development site exists.

The proposed Eirgrid uprating route crosses the Rye Water River which ultimately flows into the River Liffey. No instream works will be required as part of the uprating works nor are any significant excavation works required given that the transmission lines are overhead and any replacement of polesets or upgrading of towers, where required, will use existing foundations. The proposed GNI does not cross any watercourses. Coupled with the intervening distance between this coastal SPA and the proposed routes for the facilitation works, no significant effects as a result of the facilitation works are considered likely.

The facilitation works *i.e.*, the proposed Eirgrid uprating works and the proposed GNI upgrade works will be subject to a separate consent process including Appropriate Assessment.

South Dublin Bay SAC

South Dublin Bay SAC is located approximately 19.55km from the proposed development. The site is designated for; 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] and Embryonic shifting dunes [2110].

As outlined in Section 6.1.2, the River Liffey is hydrologically connected to the proposed development site by the surface-water drainage system that releases run-off via controlled discharge to the Leixlip Reservoir and the foul water drainage network that discharges treated foul water to the River Liffey via the Leixlip WWTP primary emission point. The River Liffey ultimately flows into Dublin Bay which makes up part of the South Dublin Bay SAC. A distant hydrological connection between South Dublin Bay SAC and the proposed development site exists.

The proposed Eirgrid uprating route crosses the Rye Water River which ultimately flows into the River Liffey. No instream works will be required as part of the uprating works nor are any significant excavation works required given that the transmission lines are overhead and any replacement of polesets or upgrading of towers, where required, will use existing foundations. The proposed GNI does not cross any watercourses. Coupled with the intervening distance between this coastal SAC and the proposed routes for the facilitation works, no significant effects as a result of the facilitation works are considered likely.

The facilitation works *i.e.*, the proposed Eirgrid uprating works and the proposed GNI upgrade works will be subject to a separate consent process including Appropriate Assessment.

North Bull Island SPA

North Bull Island SPA is located approximately 21.46km from the proposed development. The site is designated for; 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] and Wetland and Waterbirds [A999].

As outlined in Section 6.1.2, the River Liffey is hydrologically connected to the proposed development site by the surface-water drainage system that releases run-off via controlled discharge to the Leixlip Reservoir and the foul water drainage network that discharges treated foul water to the River Liffey via the Leixlip WWTP primary emission point. The River Liffey ultimately flows into Dublin Bay which makes up part of the North Bull Island SPA. A distant hydrological connection between North Bull Island SPA and the proposed development site exists.

The proposed Eirgrid uprating route crosses the Rye Water River which ultimately flows into the River Liffey. No instream works will be required as part of the uprating works nor are any significant excavation works required given that the transmission lines are overhead and any replacement of polesets or upgrading of towers, where required, will use existing foundations. The proposed GNI does not cross any watercourses. Coupled with the intervening distance

between this coastal SPA and the proposed routes for the facilitation works, no significant effects as a result of the facilitation works are considered likely.

The facilitation works *i.e.*, the proposed Eirgrid uprating works and the proposed GNI upgrade works will be subject to a separate consent process including Appropriate Assessment.

North Dublin Bay SAC

North Dublin Bay SAC is located approximately 21.57km from the proposed development. The site is designated for; 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] and *Petalophyllum ralfsii* (Petalwort) [1395].

As outlined in Section 6.1.2, the River Liffey is hydrologically connected to the proposed development site by the surface-water drainage system that releases run-off via controlled discharge to the Leixlip Reservoir and the foul water drainage network that discharges treated foul water to the River Liffey via the Leixlip WWTP primary emission point. The River Liffey ultimately flows into Dublin Bay which makes up part of the North Dublin Bay SAC. A distant hydrological connection between North Dublin Bay SAC and the proposed development site exists.

The proposed Eirgrid uprating route crosses the Rye Water River which ultimately flows into the River Liffey. No instream works will be required as part of the uprating works nor are any significant excavation works required given that the transmission lines are overhead and any replacement of polesets or upgrading of towers, where required, will use existing foundations. The proposed GNI does not cross any watercourses. Coupled with the intervening distance between this coastal SAC and the proposed routes for the facilitation works, no significant effects as a result of the facilitation works are considered likely.

The facilitation works *i.e.*, the proposed Eirgrid uprating works and the proposed GNI upgrade works will be subject to a separate consent process including Appropriate Assessment.

Site Name & Code	Conservation Summary	Minimum Distance from Site (km)
Rye Water Valley/Carton pNHA (001398)	This pNHA is encompassed within the Rye Water Valley/Carton SAC. The conservation importance of the site lies in the presence of several rare and threatened plant and animal species, and the presence of petrifying springs, a habitat type listed on Annex I of the E.U. Habitats Directive. The woods found on Carton Estate and their birdlife are of additional interest. The Rye Water River flows into the River Liffey downstream of the proposed development site. No elements of the proposed development are considered likely to result in significant impacts on the Rye Water Valley/Carton pNHA.	0.96km
Royal Canal pNHA (002103)	The Royal Canal is a man-made waterway linking the River Liffey at Dublin to the River Shannon near Tarmonbarry. The ecological value	1.11km

Site Name & Code	Conservation Summary	Minimum Distance from Site (km)
	of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods. Royal Canal pNHA is not hydrologically connected to the proposed development site; therefore, no significant effects are expected on this pNHA.	
Liffey Valley pNHA (000128)	This pNHA is located along the River Liffey between Leixlip Bridge on the Kildare-Dublin border and downstream of the weir at Glenaulin, Palmerstown, Co. Dublin. The site is important because of the diversity of the habitats within the site, ranging from aquatic to terrestrial. A number of rare and threatened plant species have been recorded from the site. The River Liffey, and associated Liffey Valley pNHA, is hydrologically connected to the proposed development site by the surface-water drainage system that releases run-off via controlled discharge to the Leixlip Reservoir and the foul water drainage network that discharges treated foul water to the River Liffey via the Leixlip WWTP primary emission point.	1.30km
Grand Canal pNHA (002104)	The Grand Canal is a man-made waterway linking the River Liffey at Dublin with the Shannon at Shannon Harbour and the Barrow at Athy. The ecological value of the canal lies more in the diversity of species it supports along its linear habitats than in the presence of rare species. It crosses through agricultural land and therefore provides a refuge for species threatened by modern farming methods. Grand Canal pNHA is not hydrologically connected to the proposed development site; therefore, no significant effects are expected on this pNHA.	2.60km
Slade of Saggart and Crooksling Glen pNHA (000211)	The pNHA stretches from Britta northward to c. 2km south of Saggart. The northern half of the site comprises a river valley with steep tree-covered sides, while the southern side is flatter and contains two small lakes (the Brittas Ponds). The site is important as a good example of a wooded river valley and a small wetland system that supports rare plants, invertebrates and birds. Slade of Saggart and Crooksling Glen pNHA is not hydrologically connected to the proposed development site; therefore, no significant effects are expected on this pNHA.	10.35km
Lugmore Glen pNHA (001212)	The pNHA is located 2km southeast of Saggart, Dublin. The importance of this site is that it is a fine example of a wooded glen with a good representation of woodland plants. Lugmore Glen pNHA is not hydrologically connected to the proposed development site; therefore, no significant effects are expected on this pNHA.	11.17km
Kilteel Wood pNHA (001394)	This site is located about 10 km north-east of Naas and immediately east of the village of Kilteel. This site is a fine example of a largely deciduous wood.	12.35km

Site Name & Code	Conservation Summary	Minimum Distance from Site (km)
	Kilteel Wood pNHA is not hydrologically connected to the proposed development site; therefore, no significant effects are expected on this pNHA.	
Dodder Valley pNHA (000991)	The pNHA comprises a stretch of the River Dodder that extends for about 2 kilometres between Firhouse bridge and Oldbawn bridge in the south-west of Dublin city. This site represents the last remaining stretch of natural river bank vegetation of the Dodder in the built up Greater Dublin Area. Dodder Valley pNHA is not hydrologically connected to the proposed development site; therefore, no significant effects are expected on this pNHA.	13.21km
Donadea Wood pNHA (001391)	This site is located about 6 km north of Prosperous. It is the old demesne woodland of Donadea Castle, and now owned by Coillte. his site is of scientific interest as, although highly managed, it has a significant proportion of deciduous trees and parts of the site have been wooded for a long period. Donadea Wood pNHA is not hydrologically connected to the proposed development site; therefore, no significant effects are expected on this pNHA.	13.50km
Glenasmole Valley pNHA (001209)	This pNHA is encompassed within the Glenasmole Valley SAC. The site contains a high diversity of habitats and plant communities, including three habitats listed on Annex I of the E.U. Habitats Directive. The presence of four Red Data Book plant species further adds to the value of the site, as does the presence of populations of several mammal and bird species of conservation interest.	13.83km

Table 6-5 Summary of nationally designated conservation sites closest to the application site boundary.

Figure 6-7 Natura 2000 sites in the wider hinterland of the proposed development site

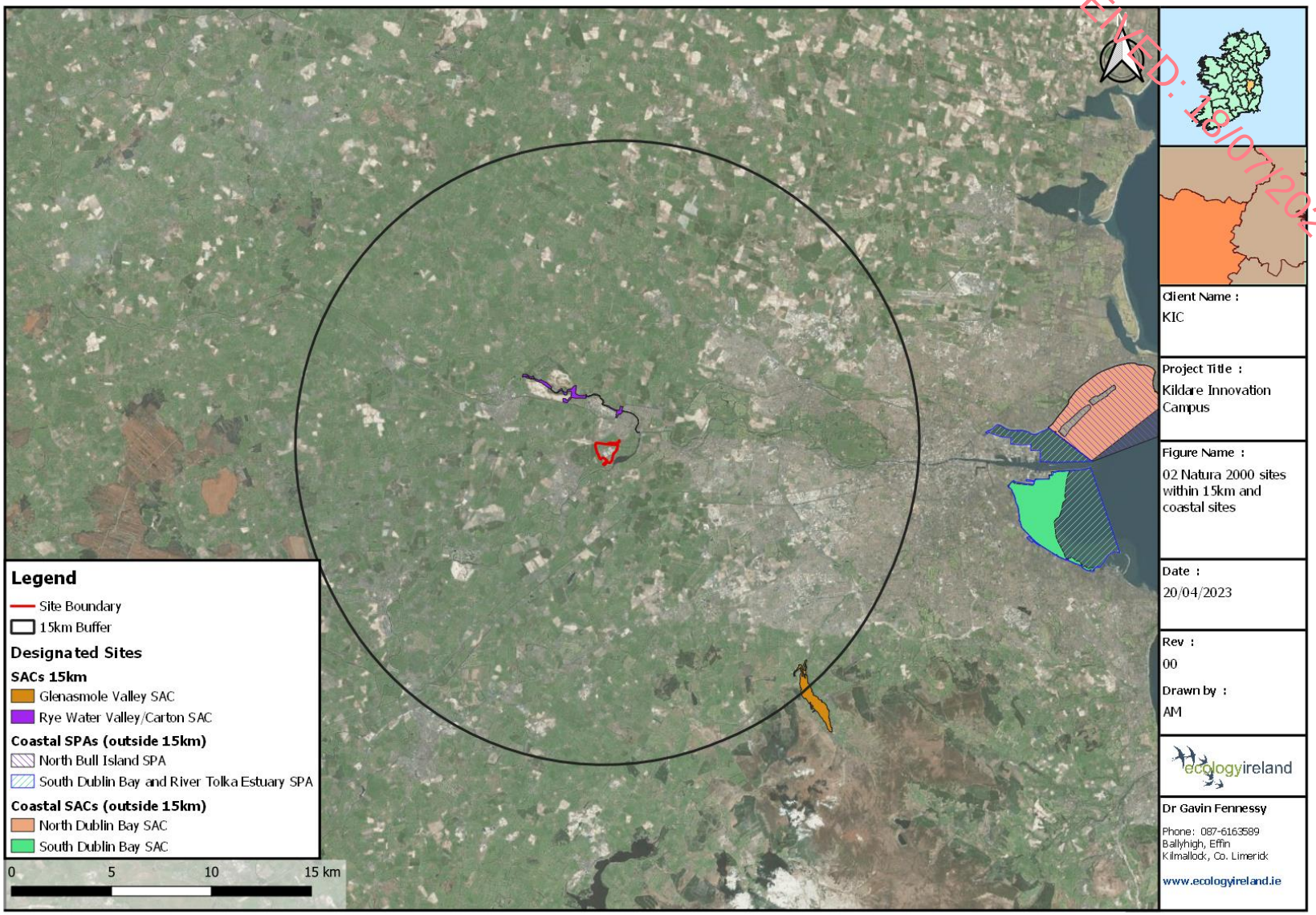
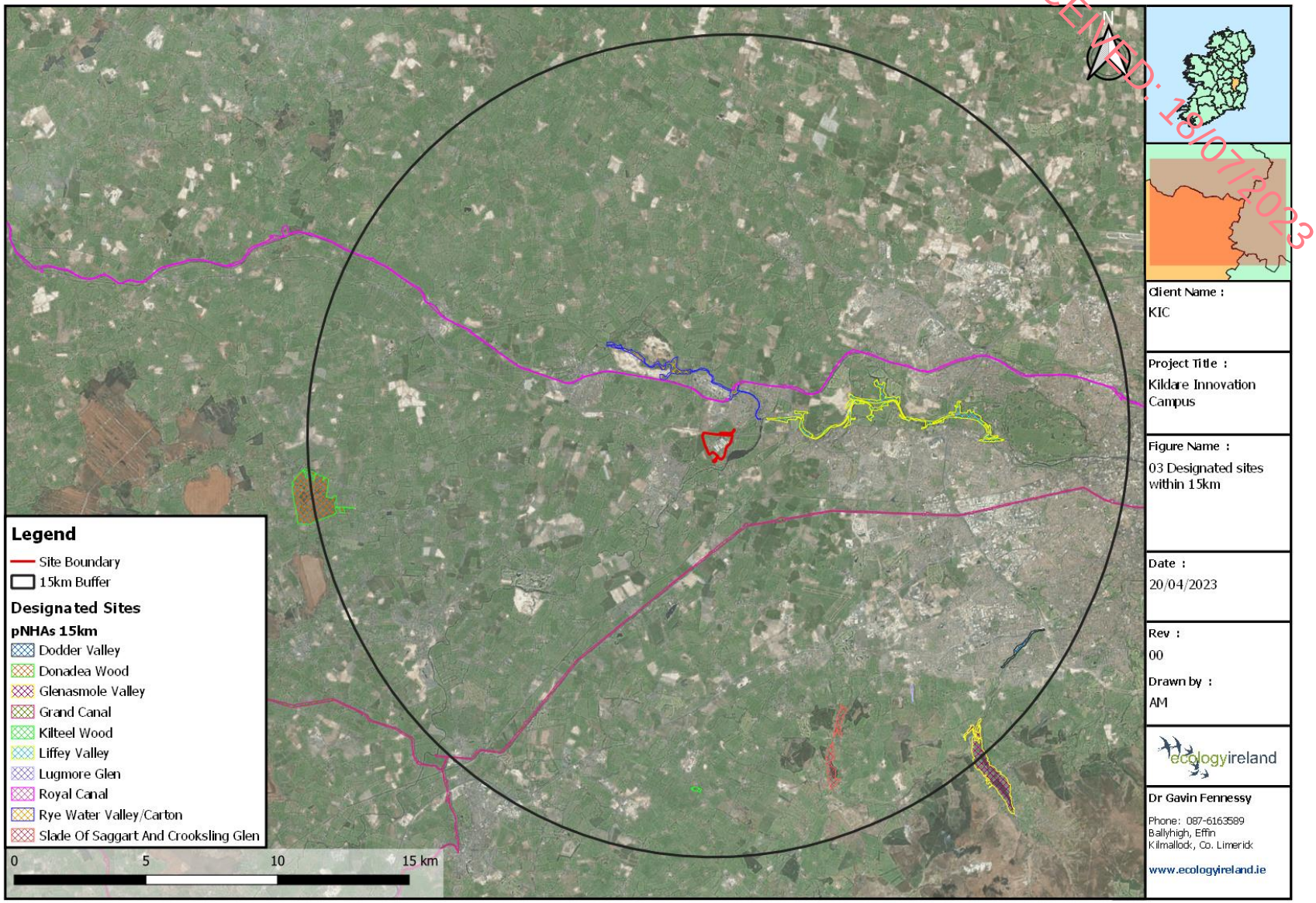


Figure 6-8 pNHAs within 15km of the proposed development site.



6.4.2 Botanical and Habitat Assessment

Desktop Review

According to the Leixlip Local Area Plan (2020 – 2023), there are a number of areas throughout Leixlip that have been identified as "key local biodiversity areas", including:

"*The woodlands, hedgerows, treelines, watercourses and extensive areas of grassland within the farmlands of Collinstown and Confey, in St. Catherine's Park, Leixlip Manor, Leixlip Castle Demesne, Barnhall and the surroundings of the commercial grounds of Intel and the* ***Hewlett Packard site*** *all provide excellent habitats which are interlinked and support widespread habitat connectivity across the study area and contribute to the GI network of Leixlip*."

No legally protected or red-listed plant species have been previously recorded in the NBDC database for the 2km grid square (N93X) within which the study area is located.

Notable records held on the NBDC database for the wider 10km grid square within which the study area is located (N93) included recent records (2017 and 2020) for Green Figwort (*Scrophularia umbrosa*) at Castletown House and Demesne on the banks of the River Liffey and tributary watercourses in 2km grid square N93W, *c*. 1 km southwest of the proposed development site. This species was previously classified as 'endangered' but has been re-evaluated as 'near threatened' in the most recent red-list for plants (Wyse-Jackson *et al*, 2016). Another notable record held on the NBDC database for the wider 10km grid square N93, is Corncockle (*Agrostemma githago*) has been recorded recently (2021), north of the Collinstown Industrial Park near the River Ryewater. This was recorded was captured within the 2km grid square, N93Y, which overlaps part of the proposed GNI upgrade route and is located *c*. 2.5 km north of the study area. This species was previously classified as 'regionally extinct' but has been re-evaluated as 'waiting list' in the most recent red-list for plants (Wyse-Jackson *et al*, 2016). This is due to uncertainty about the status of some populations as archaeophytes due to the inclusion of the species in contemporary wildflower seed mixes.

The BSBI database holds a number of records for plant species listed on the Flora (Protection) Order, 2022. Historic records of Red Hemp-nettle (*Galeopsis angustifolia*) (pre-1930's) and Hairy Dog-violet (*Viola hirta*) (1930-1949) are held for the 10km grid square N93. In addition, relatively recent records for Opposite-leaved Pondweed (*Groenlandia densa*) (1987-1999) are held for the 10km grid square N93 and Hairy St John's-wort (*Hypericum hirsutum*) (1987-1999) for the 2km grid square N93T and (2010-2019) N93W. These 2km grid squares are *c*. 2km northwest and south of the study area, respectively. The 2km grid squares, O03D and O03C, through which the proposed GNI upgrade route passes also contain records for Hairy St John's-wort which were recorded as recently as 2014 and 2018 respectively.

With regard to the proposed Eirgrid uprating route, the NBDC database also holds records for a number of species listed on Flora (Protection) Order 2022, including Hairy St John's wort for the 10km grid square O03. See Table 1 in Appendix 6.4 for the complete protected floral species list.

The NPWS map viewer[4] for bryophyte species listed on the Flora (Protection) Order, 2022 shows a historic record for *Pallavicinia lyellii* from 10km grid squares (O03) ay Leixlip Railway

[4] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=71f8df33693f48edbb70369d7fb26b7e (last accessed 09/02/2023)

Station near the River Rye Water in 1890. This was not found on a re-survey in 2006. There are no records from the 10km grid squares (N93) in which the proposed development site is located.

With regard to non-native invasive species, the NBDC database for 2km grid square N93X within which the proposed development site is located holds previous records for Cherry Laurel (*Prunus laurocerasus*) which knotweed is classified as a 'risk of high impact' invasive species (Kelly *et al*. 2013) as well as Sycamore (*Acer pseudoplatanus*), Douglas Fir (*Pseudotsuga menziesii*) and Wild Parsnip (*Pastinaca sativa*). These three species are classified as a 'risk of medium impact' invasive species (Kelly *et al*. 2013). For the proposed GNI upgrade route, there are records for Japanese knotweed (*Fallopia japonica*) within the 2km grid square O03D, and Canadian Waterweed (*Elodea canadensis*) within the 2km grid square N93Y. Both of these species are listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (*i.e.*, species of which it is an offense to disperse, spread or otherwise cause to grow in any place) or listed as being of European Union concern (IAS Regulation 1143/2014). The NBDC database for 2km grid square N93X does not contain previous records for these species or other species listed on Third Schedule.

As outlined in Section 6.3, no dedicated habitat surveys of the proposed Eirgrid uprating route and the proposed GNI route were undertaken, with a desktop review of aerial mapping and available sources of ecological data such as Corine 2018 landcover classification used in this assessment[5]. The Corine 2018 landcover for the proposed GNI route is classified as 'Artificial Surfaces' and 'Agricultural Areas'. The Corine 2018 landcover for the proposed Eirgrid uprating route includes these classifications as well as traversing landcover areas classified as 'Forest and semi-natural areas' and 'Wetlands'.

Field Survey

No habitats listed on Annex I of the EU Habitats Directive were recorded within the study area.

Botanical species protected under the Flora (Protection) Order 2022, listed in Annex II or IV of the EU Habitats Directive (92/43/EEC), or Red listed in Ireland (Wyse-Jackson *et al*. 2016) were not recorded during the site visits.

It is noted that Kildare Innovation Campus has recently subscribed as a Business Supporter of the All-Ireland Pollinator Plan[6], which will require existing campus management to incorporate pollinator friendly practices into the overall management of the grounds in fulfilment of the membership obligations.

The campus section of the study area consists of an existing group of industrial buildings that form the Kildare Innovation Campus and associated car parking and access roads (BL3). The areas immediately surrounding these built areas consist of formal landscaping such as amenity grassland (GA2), ornamental shrubbery (WS3), ornamental hedges (WL1) and treelines (WL2). Scattered trees and parkland (WD5) with amenity grassland beneath was also recorded. A series of ornamental ponds (FL8) are also located nearby. The campus is surrounded by semi-mature, landscaping of mixed broadleaved woodland (WD1) and treelines (WL2) which provides screening from adjacent roadways. A number of areas of unmanaged dry meadow and grassy verge (GS2) semi-natural grassland areas are located around the site where

[5] https://gis.epa.ie/EPAMaps/AAGeoTool
[6]https://pollinators.ie/wp-content/uploads/2023/04/All-Ireland-Pollinator-Plan-April-2023-business-supporters-newsletter.pdf

immature trees and scrub (WS1) are developing. Smaller areas of wet grassland (GS4) were also recorded. Fields to the northwest of the study area were a similar unmanaged dry meadow and grassy verge habitat but were surrounded by hedgerows and treelines that were semi-natural in nature. Areas of gravel hardstand (ED2) associated with nearby construction activities and an existing substation, as well as areas which were recolonising (ED3) in mosaic with scrub (WS1) were also noted. The north lands (*i.e.,* the lands north of the campus and the M4, within the proposed development site boundary), primarily include a haul road which comprised a raised earthen bank (ED2) at the time of survey. Dry meadow and grassy verge (GS2) habitat bordered the haul road to the south. Farmed allotments are located to the north of this section of the application site.

The following habitats (with Fossitt codes, as outlined in Section 6.3.3 above) were recorded within the study area (see Figure 6-9):

- Buildings and artificial surfaces (BL3)
- Spoil and bare ground (ED2)
- Recolonising Bare Ground (ED3)/Scrub (WS1) Mosaic
- Amenity (Improved) Grassland (GA2)
- Dry Meadows and Grassy Verges (GS2)
- Wet grassland (GS4)
- Ornamental/non-native shrub (WS3)
- Scrub (WS1)
- Mixed broadleaved woodland (WD1)
- Scattered trees and parkland (WD5)
- Hedgerows (WL1)
- Treelines (WL2)
- Other artificial lakes and ponds (FL8)

Buildings and Artificial Surfaces (BL3). This habitat type was widely recorded across the study area and consisted of a number of large industrial buildings across the Kildare Innovation Campus and associated car parking areas and access roads.

The ecological valuation of the buildings and artificial surfaces habitat is considered to be of negligible value.

Plate 1: Buildings and artificial surfaces habitat within the study area.

Spoil and Bare Ground (ED2). This habitat was recorded in the south-western and western sides of the study area and consisted of areas of gravel hardstand which were being used as storage depots for building materials and construction equipment for a development that was underway in the southwest corner of the Innovation Campus during the site visit. It was also recorded in the north lands as the haul road which was under-going construction at the time of survey.

The ecological valuation of the spoil and bare ground habitat is considered to be of negligible value.

Plate 2: Left - Spoil and bare ground habitat within the campus. Right – haul road undergoing construction in the north lands.

Recolonising Bare Ground (ED3)/Scrub (WS1) Mosaic. The recolonising bare ground/scrub mosaic habitat was recorded adjacent to one of the construction material hardstand areas in the southern side of the study area. This area was similar to the adjacent hardcore gravel hardstand but was being recolonised by a range of species indicating that the surface had been in place for a longer period and/or disturbance and traffic by construction machinery was reduced in these peripheral areas. The habitat contained frequent Bramble (*Rubus fructicosus* agg.), Willowherb (*Epilobium* sp.), Creeping Buttercup (*Ranunculus repens*) and St. John's-wort (*Hypericum* sp.). False-brome (*Brachypodium sylvaticum*), Creeping Thistle (*Cirsium arvense*),Cut-leaved Crane's-bill (*Geranium dissectum*), Common Ragwort (*Jacobaea vulgaris*), Common Centaury (*Centaurium erythraea*),Changing Forget-me-not (*Myosotis discolor*), Dandelion (*Taraxacum* agg.), White Clover (*Trifolium repens*), Thyme-leaved Speedwell (*Veronica serpyllifolia*), Creeping Cinquefoil (*Potentilla reptans*), Coltsfoot (*Tussilago farfara*), Rose (*Rosa* sp.), Lesser Trefoil (*Trifolium dubium*), Common Mouse-ear (*Cerastium fontanum*), Clematis (*Clematis* sp.) and Pyramidal orchid (*Anacamptis pyramidalis*) were occasionally recorded. Herb Robert (*Geranium robertianum*), Cowslip (*Primula veris*), Common Twayblade (*Neottia ovata*), Common Spotted Orchid (*Dactylorhiza fuchsii*) and Bee Orchid (*Ophrys apifera*) were rarely recorded.

Along with frequent Bramble, a number of woody shrub species were recorded within the habitat including frequent Dogwood (*Cornus* sp.) along with occasional immature Elder (*Sambucus nigra*) and Hawthorn (*Crataegus monogyna*) indicating that the area is gradually succeeding to scrub in the absence of any management. The presence of four species of orchid as well as a number of calcicole plants growing in the limestone hardcore gravel base indicates that it is possible that these species were introduced into the area with the loads of aggregate.

The ecological valuation of the recolonising bare ground habitat is considered to be of local importance (higher value).

Plate 3: Recolonising bare ground/scrub mosaic habitat within the study area.

Amenity (Improved) Grassland (GA2). The amenity grassland habitat was also frequently recorded within the study area, mainly around the margins the industrial buildings, access roads and car parking areas. The habitat consisted of regularly maintained lawns with frequent Yorkshire Fog (*Holcus lanatus*), White Clover and Creeping Buttercup. Red Fescue (*Festuca rubra*) and Perennial Ryegrass (*Lolium perenne*) were occasionally recorded. Dandelion and Common Mouse-ear were rarely recorded. The amenity grassland areas had recently been mown at the time of the survey and the uniform sward was c. 3-5 cm high.

The ecological valuation of the amenity grassland habitat is considered to be of local importance (lower value).

Plate 4: Amenity grassland habitat within the study area.

Dry Meadows and Grassy Verges (GS2). This habitat was frequently recorded across the study area, in particular around the north-eastern, southern and north-western margins of the site. In some locations there was evidence of low interval mowing of this habitat such as around the margins of the amenity grassland habitat. However, the majority of this habitat did not show any evidence of regular annual mowing due to the rank and lodged grass observed in many locations as well as the development of immature and sapling tree and other scrub species within the habitat.

The majority of the dry meadow and grassy verge habitat was dominated by coarse tussocky species such as abundant to frequent Cocksfoot (*Dactylis glomerata*) and False Oat-grass (*Arrhenatherum elatius*). Other grass species recorded included abundant to occasional Yorkshire Fog, occasional Meadow Foxtail (*Alopecurus pratensis*), Red Fescue, Common Couch (*Elymus repens*), Creeping Bent (*Agrostis stolonifera*), Rough Meadow-grass (*Poa trivialis*). Sweet Vernal-grass (*Anthoxanthum odoratum*) was recorded rarely in one area of grassland.

Forb species that were recorded within the habitat across the site included frequent Creeping Thistle (*Cirsium arvense*), Common Nettle (*Urtica dioica*), Cleavers (*Galium aparine*) as well as occasional Willowherb, Common Vetch (*Vicia sativa*), Meadow Vetchling (*Lathyrus pratensis*), Creeping Cinquefoil and Broad-leaved Dock (*Rumex obtusifolius*). Hairy Sedge (*Carex hirta*), Silverweed (*Argentina anserina*), Tall Fescue (*Schedonorus arundinaceus*), Cuckooflower (*Cardamine pratensis*), Curled Dock (*Rumex crispus*) and Hard Rush (*Juncus inflexus*) were rarely recorded.

As stated, the majority of the dry meadow and grassy verge habitat was unmanaged with a long sward *c*. 30 to 50 cm high and rank. A smaller area of the habitat that had been previously mown was *c*. 20 cm high and had a more open sward. Intensive grazing by rabbits around the margins of this area was also observed.

The ecological valuation of the dry meadows and grassy verges habitat is considered to be of local importance (lower value).

Plate 5: Dry meadows and grassy verges habitat within the study area.

Wet grassland (GS4). Smaller areas of wet grassland habitat were recorded in the north-eastern side of the study area where slightly lower lying areas in the surrounding dry meadows and grassy verge habitat were damp and supported a range of species including frequent Creeping Bent, Field Horsetail (*Equisetum arvense*), Silverweed, Red Fescue (*Festuca rubra*), Creeping Cinquefoil along with occasional Hairy Sedge, Yorkshire Fog, Hard Rush, Tall Fescue and Willowherb. Meadow Buttercup (*Ranunculus acris*) and Common Vetch were rarely recorded.

The sward was similar to the surrounding dry meadows and grassy verge being unmanaged and rank with *c*. 15-20 cm high sward with sapling trees scattered across the area.

The ecological valuation of the wet grassland habitat is considered to be of local importance (lower value).

Plate 6: Wet grassland habitat within the study area.

Ornamental/non-native shrub (WS3). This habitat was recorded in the form of formal landscaped areas around the car parking areas and industrial buildings. The planting schemes included *Lonicera* sp., *Cotoneaster* sp., Bamboo, *Pinus* sp., *Viburnum* sp., *Prunus* sp., *Abies* sp., *Berberis* sp. and *Escallonia* sp.

The ecological valuation of the ornamental/non-native shrub habitat is considered to be of local importance (lower value).

Plate 7: Ornamental/non-native shrub habitat within the study area.

Scrub (WS1). This habitat was recorded on the western side of the study area and consisted of frequent sapling Ash (*Fraxinus excelsior*) along with Bramble (*Rubus fructicosus*) and Willowherb. Common Hogweed (*Heracleum sphondylium*) and Pendulous Sedge (*Carex pendula*) were occasionally recorded. Sapling Oak (*Quercus* sp.) was rarely recorded. Meadow Buttercup, Yorkshire Fog and Creeping Thistle (*Cirsium arvense*) were also recorded growing at the margins and in patches through the scrub.

The ecological valuation of the scrub habitat is considered to be of local importance (lower value).

Plate 8: Scrub habitat within the study area.

Mixed broadleaved woodland (WD1). This habitat was recorded widely across the site with mixed broadleaved woodland around the study area to provide screening around the Innovation Campus boundary, around the existing substation and between car parking areas in the centre of the site.

Species recorded in these woodland areas included Birch (*Betula* sp.), Horse chestnut (*Aesculus hippocastanum*), Lime (*Tilia* sp.), Cherry (*Prunus avium*), Norway Maple (*Acer platanoides*), Oak, Rowan (*Sorbus aucuparia*), Ash, Ornamental *Sorbus* sp., Elder (*Sambucus nigra*), Hawthorn (*Crataegus monogyna*), Apple (*Malus* sp.), Beech (*Fagus sylvatica*), Hazel (*Corylus avellana*),Willow (*Salix* sp.), Dogwood (*Cornus*) and Sycamore (*Acer pseudoplatanus*) and Pine (*Pinus* sp.).

The trees were uniform, semi-mature in age and this combined with the species mix present indicates that this habitat was planted within the study area as part of a landscaping plan when the Innovation Campus was originally developed.

The ecological valuation of the mixed broadleaved woodland habitat is considered to be of local importance (higher value).

Plate 9: Mixed broadleaved woodland habitat within the study area.

Scattered trees and parkland (WD5). This habitat was recorded within the amenity grassland areas and consisted of scattered ornamental trees within the mown lawn areas. Species present included Beech, Copper Beech, Birch and Oak.

The ecological valuation of the scattered trees and parkland habitat is considered to be of local importance (lower value), with some areas to the south considered to be of local importance (higher value), given the maturity of the trees present.

Plate 10: Scattered trees and parkland habitat within the study area. Left - local importance (lower value), Right - local importance (higher value)

Hedgerow (WL1). This habitat was recorded within the study area in the form of both semi-natural hedgerows and non-native dominated formal hedging.

The semi-natural hedgerow habitat was recorded in the southwest and northwest of the study area and represented remnant field boundary hedgerows with predated the Innovation Campus development. Species present included frequent Hawthorn and occasional Willow, Elder and Dog Rose (*Rosa canina*). Semi-mature Ash and Sycamore were occasionally recorded. Bramble, Nettle and Cleavers (*Galium aparine*) were also frequently recorded.

The ecological valuation of the semi-natural hedgerow habitat is considered to be of local importance (higher value).

Plate 11: Semi-natural hedgerow habitat within the study area.

The ornamental hedge habitat was recorded around the car parking areas close to the industrial buildings with maintained hedgerows dominated by Beech which were clipped to form a box hedge *c.* 1.2 m high. Semi-mature Lime trees *c.* 6-8 m high were planted at *c.* 6 m intervals along this hedge.

The ecological valuation of the ornamental hedge habitat is considered to be of local importance (lower value).

Treeline (WL2). The treeline habitat was recorded widely across the study area. It consisted of semi-mature treelines around car parking areas which contained a mix of species and were part of the overall landscaping plan. Semi-natural treelines which correspond to old field boundaries were recorded in the northwest of the study area.

The more formal treelines around the built-up areas contained Lime, Birch and Cherry. The semi-natural treelines contained mature Oak and Ash as well as a well-developed under layer of Blackthorn (*Prunus spinosa*), Elder, Hawthorn and Bramble.

The ecological valuation of the treeline habitat is considered to be of local importance (higher value).

Plate 12: Ornamental type treeline habitat within the study area.

Other artificial lakes and ponds (FL8). This habitat was recorded on the eastern side of the study area and consisted of a number of constructed ornamental ponds. The ponds were mainly open water with Yellow Iris (*Iris pseudacorus*) frequent along the margins along with occasional Mare's Tail (*Hippuris vulgaris*) and Water Lilly (*Nymphaea* sp.) which was rarely recorded. The bank vegetation was ornamental in nature with a mix of Willow, Birch, Dogwood, New Zealand Flax (*Phormium* sp.) and Cotoneaster along with areas of open gravel.

The ecological valuation of the artificial lakes and ponds habitat is considered to be of local importance (higher value).

Plate 13: Artificial lakes and ponds habitat within the study area.

Protected and Red-listed Flora

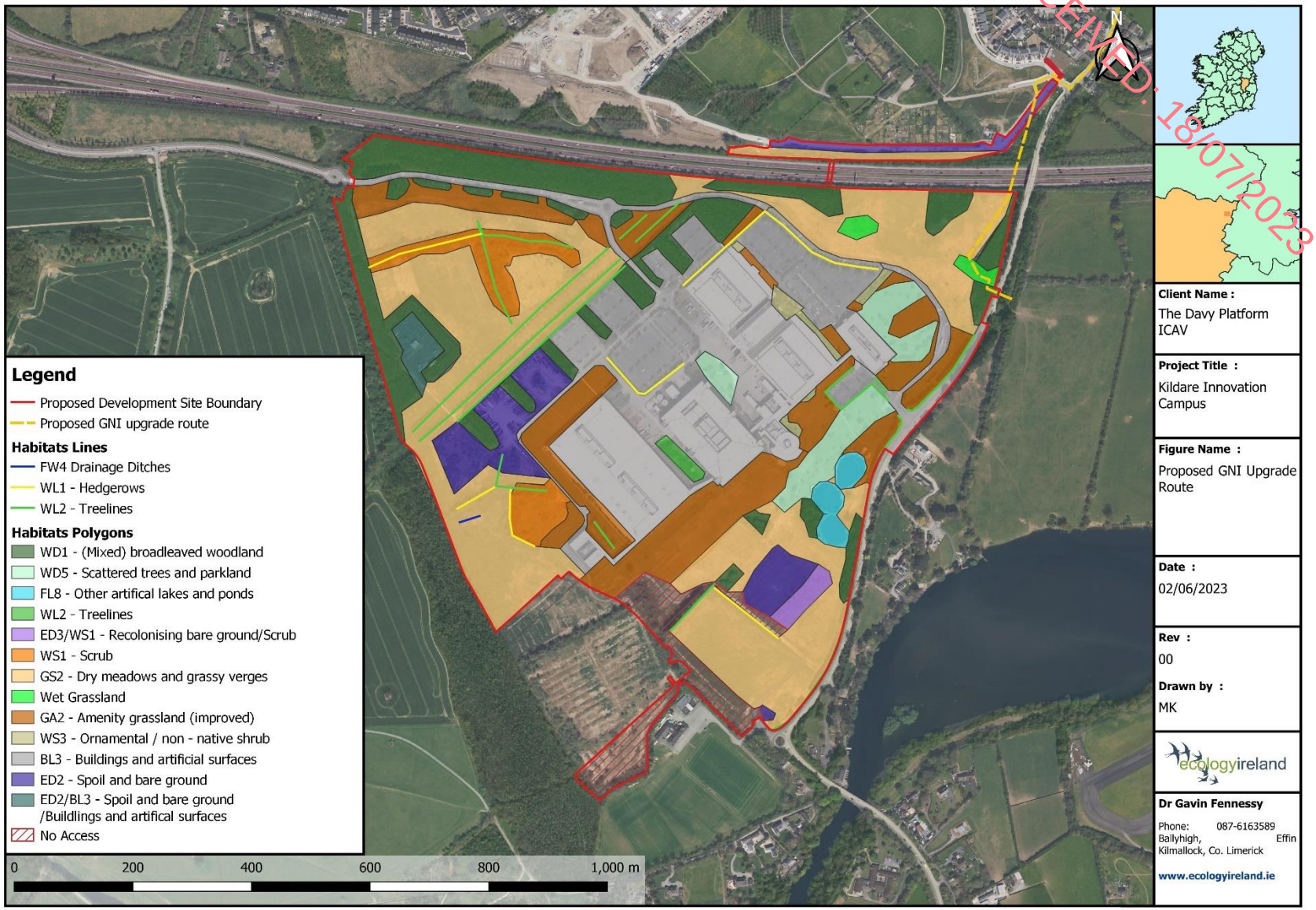
No legally protected or Red-listed plants were recorded within the boundary of the proposed development site during the baseline survey.

Invasive Species

No invasive species listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations (*i.e.*, species of which it is an offense to disperse, spread or otherwise cause to grow in any place) were recorded within the proposed development boundary or along the proposed GNI upgrade route.

Sycamore which has been identified as an invasive species with a risk of medium impact (Kelly *et al*, 2013) was recorded occasionally across the proposed development site. This species is widespread and naturalised throughout the Irish landscape.

Figure 6-9 Habitat map for the study area



6.4.3 Fauna Assessment

6.4.3.1 Non-Volant Mammals

Eleven confirmed non-volant mammal species were recorded during ecological surveys and by the trail cameras. Signs of Fox (*Vulpes vulpes*) and Rabbit (*Oryctolagus cuniculus)* in the form of prints and droppings were recorded throughout the study area. Foxes were regularly sighted during ecological surveys and recorded by the trail cameras. A fox cub observed on the 16th of June during the habitat and botanical survey and a picture of a fox with two cubs was captured by the trail cameras. Cats and rabbits were also regularly observed during ecological surveys. Irish Hare (*Lepus timidus hibernicus*) was observed on three occasions, once on the 28th of April 2022 within the grassland habitats to the northwest, once on the 14th of June 2022 on the roadway bordering the northeast boundary of the study area and once on the 28th of March 2023 within the parkland habitat to the northeast. Grey Squirrel (*Sciurus carolinensis*) was observed within the woodland habitats near the ponds on the 8th of June and 10th of August 2022. Small mammal burrows, likely Rabbit, were recorded within the open parkland habitats and along hedgerow field boundaries. Deer prints were recorded along the hedgerow field boundaries in the northwest section of the campus. Within areas of scrub and alongside field margins, mammal trails were observed.

Trail camera footage was analysed, and the results can be seen in Table 6-6 and Plates 14-17 below.

While no breeding and/or resting places of any protected mammal were recorded during the site walkovers of the study area (*e.g*., setts, latrines, feeding signs, *etc*.), suitable habitat exists for species such as Badger. Badger was also recorded by two of the trail cameras. As part of the ecological surveys carried out as part of the EcIA for the DB Schenker site, a potential Badger sett was recorded *c.* 100m east of the DB Schenker site boundary, with no other Badger activity recorded within the DB Schenker site (Environmental Resources Management Ltd, 2020b). No Badger sett was recorded as part of the ecological surveys undertaken as part of the planning application for the proposed development. Furthermore, while Badger was recorded by trail cameras deployed as part of the pre-construction surveys completed for the DB Schenker site, no Badger sett was located (Ecology Ireland, 2022).

There are a number of records for non-volant mammals protected under the Wildlife Acts (1976; Wildlife Amendment Act, 2000) within the 2km grid square (NBDC: N93X) overlapping the study area including Badger (*Meles meles*), Red Squirrel (*Sciurus vulgaris*) and Hedgehog (*Erinaceus europaeus*). These species are listed as "Least Concern" in Ireland at present (Marnell *et al*. 2019). There are also records for Rabbit and Fox. Grey Squirrel, a high impact invasive species, has also been recorded in N93X.

There are number of records for additional protected mammal species within the wider area of the 10km grid square (NBDC: N93) in which the campus is located: Pygmy Shrew (*Sorex minutus*), Irish Hare (*Lepus timidus hibernicus*), Irish Stoat (*Mustela erminea hibernica*), Pine Marten (*Martes martes*), Red Deer (*Cervus elaphus*), and Otter (*Lutra lutra*). Otter is listed on Annex II and Annex IV of the EU Habitats Directive. Additional invasive mammal species recorded include, American Mink (*Mustela vison*), Brown Rat (*Rattus norvegicus*), Feral Ferret (*Mustela furo*), Greater White-toothed Shrew (*Crocidura russula*) and House Mouse (*Mus musculus*) have also been recorded in this area. The protected species listed above, namely

Otter, Badger, Irish Hare, Irish Stoat, Pine Marten and Hedgehog, have also been recorded within the adjacent 2km grid squares (NBDC: N93Y, O03D and O03C) through which part of the GNI upgrade route passes. With regard to the proposed Eirgrid Uprating route, the NBDC database holds records for a number of protected species including Otter which is widely recorded throughout the range of the proposed route (NBDC N53, N54, N63, N73, N83, N84, N93, O03). See Table 2 in Appendix 6.4 for the complete list of 10km grid square records for protected non-volant mammal species held by the NBDC database for the proposed Eirgrid uprating route.

Otter is a highly mobile species that can occur at a distance from the nearest suitable watercourse which in this case are the River Liffey and the Rye Water River. No Otter activity was recorded during site walkovers of the campus. There is no optimal foraging/breeding habitat for Otter within the campus or along the proposed GNI upgrade route. Therefore, any occurrence of Otter within the proposed development site would likely to be on a transient basis at most.

Table 6-6 Trail Camera Survey Results for Non-Volant Mammals

Species	Cam1	Cam2	Cam3	Cam4	Cam5	Cam6
Red Deer	1			2	1	2
Fox		58	5	83	34	
Grey Squirrel		1		5		
Hedgehog		5		2	4	
Badger		1			1	
Rabbit		10		149		
Field Mouse				8		
Unidentified small mammal (mouse/vole/shrew)				4		
Brown Rat				1		
Dog					1	

Plate 14: Grey Squirrel on trail camera footage.

Plate 15: Hedgehog on trail camera footage.

Plate 16: Fox with two cubs on trail camera footage.

Plate 17: Badger on trail camera footage.

6.4.3.2 Bats

From the analysis of the bat call registrations recorded by all 14 no. passive detectors, the presence of five bat species was confirmed (See Table 6-7 below). Soprano Pipistrelle, (*Pipistrellus pygmaeus*), Leisler's Bat (*Nyctalus leisleri*), Common Pipistrelle, (*Pipistrellus pipistrellus* were the most commonly recorded species with Soprano Pipistrelle accounting for 40% of all registrations. Passive detector BD1 was deployed at the ponds and recorded the most bat activity overall, followed by BD7 which was deployed just west of the ponds. For example, 94% of Daubenton's Bat (*Myotis daubentonii*) registrations were picked up at BD1. This was to be expected considering that the ponds likely provide very suitable foraging habitat for bats, particularly Daubenton's Bat. A high level of bat activity was also recorded in proximity to woodland and the semi-natural treelines with the study area with a total of 4,464 bat registrations recorded by BD8 which was deployed next to a stand of broadleaved woodland habitat. After BD1, the highest number of registrations for Leisler's Bat was recorded by BD3 with 1,788 registrations. BD3 was deployed in the vicinity of the Castletown House woodland belt that borders the west boundary of the campus. Relatively low levels of bat activity were recorded by the passives deployed by the substation (BD5) and near the large car-parking area to the northeast (BD4) (See Table 6-7).

The buildings that are proposed to be demolished, *i.e.,* 7, 8 & 9 were inspected on the 28th of April 2022 and revisited in March 2022. The building inspection recorded no evidence of current or historic signs of usage by bats inside or outside any of the three buildings, nor were any suitable roosting opportunities for bats within the buildings recorded. As seen in Table 6-7, no bat activity was recorded by the passives (BD9, BD10, BD11) deployed in these buildings.

There are 535 no. trees and 52 no. tree group areas proposed for removal in order to facilitate the construction of the proposed development. The majority of these trees were assessed as having 'Negligible' to 'Low' roosting suitability for bats. These included trees within the more managed areas of the campus such as the car-parking areas, parkland habitat surrounding the campus buildings and the treelines lining the access roads within and bordering the campus boundary, as well as the uniform woodland areas planted for the purpose of screening the existing campus and substation. These trees lacked visible potential roost features (PRFs), comprised smooth narrow trunks and had little to no ivy cover, or were considered to be too young to produce appropriate cavities/scars *etc*. (See Plate 18). 56 no. trees were assessed as having 'Moderate' to 'High' roosting suitability for bats and were located throughout the campus, particularly within the more semi-natural hedgerow and treeline habitats to the west and northwest. These trees were typically mature/over-mature deciduous species such as Oak, Lime and Beech, characterised by the presence of multiple PRFs, often quite pronounced, such as wounds, tear-outs, pruning cuts, cracks and/or strong ivy cover often partially detached from the trunk in places (See Plate 19). Such trees were often in proximity to each other such as within the same treeline area. See Appendix 6.5 for a detailed list of trees assessed as having 'Moderate' to 'High' roosting suitability.

During the preliminary ground-level roost assessment survey of trees, a number of bat boxes were recorded within the woodland area directly west of the ponds (See Plate 20). These boxes were deployed as part of the permitted development of the DB Schenker site, where a number of bat roost boxes were sourced and erected within this woodland area directly west of the ponds in proximity to the DB Schenker site. No roosting bats were recorded within the DB Schenker site during the pre-planning EcIA surveys (Environmental Resources Management Ltd, 2020b), nor were any recorded during the pre-construction surveys which included the inspection of PRFs via tree-climbing surveys prior to felling (Ecology Ireland, 2022).

Active surveys (AS1 and AS2) were carried out on the 28th March 2023 and emergence surveys (ES1 and ES2) were carried out on the 29th March 2023, with a focus on areas where large mature trees considered to have 'High' roosting suitability for bats were present (See Figure 6-5). At AS1, Three Soprano Pipistrelle were observed flying in the vicinity of the treeline habitat at 20:53, with a single Soprano Pipistrelle registration recorded. At AS2, there was almost continuous bat activity recorded from 20:40 until the end of the survey, of 2-3 Soprano Pipistrelle foraging by the streetlights along Celbridge Road (R404). Common Pipistrelle were observed on at least three occasions, at 20:56, 21:05, and 21:20. *Myotis* sp., potentially Daubenton's Bat, was recorded in the vicinity of the ponds at 21:00 with Daubenton's Bat confirmed to be feeding over the ponds at 21:20.

During the emergence survey completed at ES1, no bats were observed emerging or active in the vicinity of the Oak tree under observation (Tree ID: T1670, see Plate 20) or surrounding environment, nor were there any registrations of bat activity recorded. At ES2, no signs of emergence were recorded from the vicinity of the Oak tree under observation (Tree ID: T1129). Soprano Pipistrelle were recorded towards the ponds and woodland area between 20:30-20:45, where the bats appeared to forage over a wide area. Soprano Pipistrelle was again recorded, at a distance, at 20:58 and 21:07. Leisler's Bat was records towards the end of the survey near the ponds at 21:15 when a single individual was recorded briefly commuting through the study area.

As stated in Section 6.3.4, three passive bat detectors (BD12, BD13, BD14) were deployed in order to support the active and emergence surveys. Little to no activity was recorded by BD13 and BD14 while high levels of activity were recorded by BD12, which was deployed by the ponds (See Table 6-7). It is noted that the active and emergence surveys were completed outside of the optimal survey period.

Table 6-7 Number of bat registrations recorded at 14 bat detectors located throughout the study area.

Species	Scientific Name	BD1	BD2	BD3	BD4	BD5	BD6	BD7	BD8	BD9	BD10	BD11	BD12	BD13	BD14
Common Pipistrelle	*Pipistrellus pipistrellus*	1739	1030	733	1	8	265	889	2115				398	1	
Soprano Pipistrelle	*Pipistrellus pygmaeus*	5135	299	692		11	901	1901	1854				688	1	
40/50kHz Pipistrelle	*Pipistrellus sp.*	31	74	22			8	21	8				2		
Daubenton's Bat	*Myotis daubentonii*	985	14	16				35					3		
Brown Long-eared Bat	*Plecotus auritus*	22		14			15	18	3						
Myotis sp.	*Myotis sp.*	19	2	7			9	10	5					1	
Leisler's Bat	*Nyctalus leisleri*	3101	757	1788	4	5	1035	1237	479				7	2	

Plate 18. Example images of trees and tree groups assessed as having 'Negligible' to 'Low' roosting suitability for bats due to a lack of suitable Potential Roost Features (PRFs). The top image shows Tree-ID G40, bottom-right shows Tree-ID W28, bottom-left shows Tree-ID T1240.

Plate 19. Examples of trees assessed as having 'Moderate' – 'High' roosting suitability for bats. Top-left shows a mature Oak with strong ivy cover and broken limbs, assessed as 'High' (Tree-ID T1670), Top-right shows an early mature Horse Chestnut with no ivy cover but visible PRFs in the form of peeling bark and a likely canker, assessed as 'Low'/'Moderate' (Tree-ID T1036), Bottom-right shows a mature Oak with no ivy cover but visible PRFs such as historical pruning cuts, assessed as 'High' (Tree-ID T1103), Bottom-left shows a mature Ash with strong ivy cover and pronounced limb breakages, assessed as 'High' (Tree-ID T1532).

Plate 20. Bat box erected within the woodland habitat directly adjacent to the ponds, deployed as part of the permitted development of the DB Schenker site.

Two bat species have been recorded within the 2km grid square (NBDC: N93X) encompassing the study area: Daubenton's Bat (*Myotis daubentonii*) and Leisler's Bat (*Nyctalus leisleri*). Within N93Y, O03D and O03C 2km grid squares through which part of the GNI upgrade route passes, there are records held for Daubenton's Bat, Leisler's Bat, Brown Long-eared Bat (*Plecotus auritus*), Pipistrelle sp., and Soprano Pipistrelle (*Pipistrellus pygmaeus*). Within the 10km grid square (NBDC: N93), there are additional records for Natterer's Bat (Myotis nattereri) and Whiskered Bat (*Myotis mystacinus*). With regard to the Eirgrid uprating route, the NBDC database holds additional records for Nathusius' Pipistrelle *Pipistrellus nathusii* with the 10km grid square O03. See Table 3 in Appendix 6.4 for the complete list of 10km grid square records for bat species held by the NBDC database for the proposed Eirgrid uprating route.

The Model of Bat Landscapes (Lundy *et al.* 2011) suggests that the study area, the proposed GNI upgrade route and the proposed Eirgrid uprating route are part of a landscape that has a moderate – high resource value for bats in general (see Roche *et al.* 2014), with the exception of Lesser Horseshoe Bat *Rhinolophus hipposideros* and Nathusius' Pipistrelle, where the development site is located outside the normal range of these species.

None of the Irish bat species are of elevated conservation concern at present. All bat species occurring in Ireland are legally protected under the Irish Wildlife Acts (1976 - 2012). Under this protection, it is an offence to hunt or interfere with or destroy their breeding or resting places (unless under statutory licence/permission). Irish bat species listed are also listed on

Annex IV of the EU Habitats Directive, with Lesser Horseshoe Bats listed on Annex II and Annex IV.

6.4.3.3 Birds

In total, 16 dedicated bird transect surveys were completed across April and June 2022 and November 2022 and February 2023. The results of these surveys are outlined in Table 6-8 and Table 6-9. A total of 55 bird species were recorded during transects, 48 of which were recorded during the breeding survey period and 43 that were recorded during the winter survey period. These included five Red-Listed species; Kestrel (*Falco tinnunculus*), Meadow Pipit (*Anthus pratensis*), Redwing (*Turdus iliacus*), Snipe (*Gallinago gallinago*) and Swift (*Apus apus*) (Gilbert *et al.* 2021). There is foraging and breeding habitat available for Kestrel, particularly in the more semi-natural hedgerow and treeline habitats. Meadow Pipit are ground nesting birds that are found in a wide variety of habitats from grassland habitats to upland heath and bog. Redwing is a relatively abundant migrant species that favours open lowland fields. Snipe, a ground-nesting species that is red-listed for breeding and wintering, favours habitats such as peatland and wet grassland. While there is suitable foraging habitat for Swift, particularly over the ponds, there is no suitable breeding habitat available within the study area for these species. Peregrine Falcon (*Falco peregrinus)* was recorded in flight over the main campus buildings at the centre of the study area during one of the breeding surveys completed at Transect 3. Peregrine Falcon is on the EU Birds Directive (2009/147/EC) Annex I list and is therefore considered of high conservation concern across Europe. There is no suitable breeding habitat for this species although the habitats within the campus could foraging/hunting opportunities for both species.

A casual species list for birds recorded during other ecological surveys is shown in Table 6-10, and those recorded by the trial cameras is shown in Table 6-11 and Plate 22. Barn Owl (*Tyto alba*) and Peregrine Falcon were both observed prior to the commencement of the bat surveys (emergence) on the 29th of March 2023. Barn Owl, a Red-Listed species, was observed in flight in the northwest section of the study area and Peregrine Falcon was observed flying over the main campus buildings, disturbing a small flock of Black-headed Gull. Coot, an Amber-Listed species, was recorded breeding at the ponds on the 16th of June 2022 during the habitat/botanical survey. Table 6-12 below details the bird species recorded on the 1st of February 2023 within the north lands. As part of ecological surveys completed at the site between the 28th and 30th of March 2023 (roost assessment survey of trees), numerous bird nests were observed throughout the site, with bird boxes noted to be present within the woodland area bordering the ponds to the west (See Plate 23). These bird boxes were erected as part of the permitted development of the DB Schenker site, where bird boxes were sourced and erected within this woodland area, with the bat roost boxes, directly west of the ponds in proximity to the DB Schenker site (Ecology Ireland, 2022). Coot, an Amber-Listed species, were also noted to be breeding on the ponds, during these ecological surveys (See Plate 23).

The NBDC database holds records for 61 bird species within the 2km grid squares that encompass the study area and the proposed GNI upgrade route (N93X, N93Y, O03C, O03D), with 32 of these species recorded within N93X where the study area and the majority of the proposed GNI upgrade route are located (See Table 6-13). This includes records for Pochard (*Aythya ferina*) and Scaup (*Anas marila*), both of which are Red-Listed species. While the habitats within the site, namely the ponds, could provide some foraging opportunities for these species, they would not support any substantial breeding or wintering numbers. There are also records for Great Crested Grebe (*Podiceps cristatus*), Mallard (*Anas platyrhynchos*), Mute Swan (*Cygnus olor*) and Tufted Duck (*Aythya fuligula*), all of which are Amber-Listed

species. As with Pochard and Scaup, the habitats within the site are not optimal for these species and there is more attractive habitat, namely the Leixlip Reservoir, present in the wider environment. See Table 4 in Appendix 6.4 for the complete list of 10km grid square records for bird species held by the NBDC database for the proposed Eirgrid uprating route.

In general, the study area contains suitable foraging, commuting, nesting and perching habitats for a range of bird species in habitats such as the ponds, scrub and woodland and the more semi-natural treeline and hedgerow habitats. Similar habitats are also present in the wider landscape, particularly the woodland habitat directly adjacent to western boundary of the campus, and Leixlip Reservoir to the east. Most bird species are protected under the Irish Wildlife Acts (1976 - 2012), where it is an offence to hunt, interfere with or destroy their breeding or resting places (unless under statutory licence/permission).

Plate 21. Left – Pheasant, Right – Jay, on trail camera footage.

Plate 22. Left - Bird nest observed in a semi-mature lime tree (Tree ID: T739). Right – Bird box observed within the woodland habitat adjacent to the ponds, erected as part of the permitted development of the DB Schenker site.

Plate 23. Coot chicks observed within the ponds during ecological surveys of the study areas between the 28th and 30th of March 2023.

Table 6-8. Breeding Bird Transect Results. Visit 1 completed on the 28th of April 2022. Visit 2 completed on the 8th of June 2022. Counts provided as total within 100m on each survey visit and if only recorded beyond 100m this is noted as 'P' for present. [Note Cormorant was only seen in flight]

Species	Scientific Name	T1 (visit 1)	T1 (visit 2)	T2 (visit 1)	T2 (visit 2)	T3 (visit 1)	T3 (visit 2)	T4 (visit 1)	T4 (visit 2)
		<100m	<100m	<100m	<100m	<100m	<100m	<100m	<100m
Blackbird	*Turdus merula*	3	4	1	2	3	2	3	3
Blackcap	*Sylvia atricapilla*							1	1
Blue Tit	*Cyanistes caeruleus*	2		1	1	2	1		
Bullfinch	*Pyrrhula pyrrhula*						2		
Buzzard	*Buteo buteo*		P					P	
Chaffinch	*Fringilla coelebs*	4	3	2	3	3	2		1
Chiffchaff	*Phylloscopus collybita*		P		1		P		
Coal tit	*Periparus ater*		1			1	3		
Collared Dove	*Streptopelia decaocto*						2		
Coot*	*Fulica atra*		2						
Cormorant*	*Phalacrocorax carbo*			P					
Dunnock	*Prunella modularis*	1	1					1	
Feral Pigeon	*Columba livia f. domestica*		P	P	3				
Goldcrest*	*Regulus regulus*	3	1		2	2	2		
Goldfinch	*Carduelis carduelis*	5	3		2			3	
Great Tit	*Parus major*		1			1	2		
Grey Heron	*Ardea cinerea*		1						
Herring Gull*	*Larus argentatus*	2	P	P		P	P		
Hooded Crow	*Corvus cornix*	4	5		2				2
House Martin*	*Delichon urbicum*		2	1	3				
House Sparrow*	*Passer domesticus*						3		7
Jackdaw	*Corvus monedula*	P		2	3		1	1	1
Jay	*Garrulus glandarius*		1				1		
Kestrel^	*Falco tinnunculus*							1	
Lesser Black-backed Gull*	*Larus fuscus*	1	3	P					
Linnet*	*Carduelis cannabina*							4	
Little Grebe	*Tachybaptus ruficollis*		2						
Long-tailed Tit	*Aegithalos caudatus*						4		
Magpie	*Pica pica*	3	2		1		P	P	1
Mallard*	*Anas platyrhynchos*	3	4						

Species	Scientific Name	T1 (visit 1)	T1 (visit 2)	T2 (visit 1)	T2 (visit 2)	T3 (visit 1)	T3 (visit 2)	T4 (visit 1)	T4 (visit 2)
		<100m	<100m	<100m	<100m	<100m	<100m	<100m	<100m
Meadow Pipit^	*Anthus pratensis*					1		2	2
Mistle Thrush	*Turdus viscivorus*		1		2				
Moorhen	*Gallinula chloropus*	2	3						
Peregrine Falcon†	*Falco peregrinus*					P			
Pheasant	*Phasianus colchicus*	P	P						2
Pied Wagtail	*Motacilla alba*	1		1	1				
Robin	*Erithacus rubecula*	4	4	1		2	3	3	1
Rook	*Corvus frugilegus*	2	P		P		6	4	1
Song Thrush	*Turdus philomelos*	P				1	P		
Sparrowhawk	*Accipiter nisus*								1
Starling*	*Sturnus vulgaris*	11	5	3					4
Stonechat	*Saxicola rubicola*							1	1
Swallow*	*Hirundo rustica*	4	8	6	5	7	4		P
Swift^	*Apus apus*		P				2		
Wheatear*	*Oenanthe oenanthe*						1		
Willow Warbler*	*Phylloscopus trochilus*	5	4	2		3	1	3	2
Woodpigeon	*Columba palumbus*	9	2	5	6	8	10	3	4
Wren	*Troglodytes troglodytes*	2	4	1		3	3	2	1

Key ^ Red-listed species, * Amber-listed species (Gilbert *et al*. 2021), † Annex I species under the EU Birds Directive [2009/147/EC]

Table 6-9. Wintering Bird Transect Results. Visit 1 completed on the 30th of November 2022. Visit 2 completed on the 1st of February 2023. Counts provided as total within 100m on each survey visit and if only recorded beyond 100m this is noted as 'P' for present.

Species	Scientific Name	T1 (visit 1)	T1 (visit 2)	T2 (visit 1)	T2 (visit 2)	T3 (visit 1)	T3 (visit 2)	T4 (visit 1)	T4 (visit 2)
		<100m	<100m	<100m	<100m	<100m	<100m	<100m	<100m
Blackbird	*Turdus merula*	3	2	1	1	2	1	4	3
Blue Tit	*Cyanistes caeruleus*	2		1	1	2	1		
Buzzard	*Buteo buteo*						P		1
Chaffinch	*Fringilla coelebs*	6	4	4	2	3	3	2	4
Coal Tit	*Periparus ater*	1				2	2		
Coot*	*Fulica atra*	2	2						
Dunnock	*Prunella modularis*					1		1	

Species	Scientific Name	T1 (visit 1)	T1 (visit 2)	T2 (visit 1)	T2 (visit 2)	T3 (visit 1)	T3 (visit 2)	T4 (visit 1)	T4 (visit 2)
		<100m	<100m	<100m	<100m	<100m	<100m	<100m	<100m
Feral Pigeon	*Columba livia f. domestica*	4		2	3				
Goldcrest*	*Regulus regulus*	3	2			2	4		
Goldfinch	*Carduelis carduelis*	2	8	3				4	
Great Tit	*Parus major*	1	1		1			2	
Grey Heron	*Ardea cinerea*		P						
Grey Wagtail^	*Motacilla cinerea*	1							
Herring Gull*	*Larus argentatus*	P	2	2	1				
Hooded Crow	*Corvus cornix*	1	5		2			2	2
House Sparrow*	*Passer domesticus*			4	6				
Jackdaw	*Corvus monedula*	3	1	2		4	1	2	1
Jay	*Garrulus glandarius*					1	1		
Kestrel^	*Falco tinnunculus*		P						
Lesser Black-backed Gull*	*Larus fuscus*	1	2		1				
Lesser Redpoll	*Carduelis flammea cabaret*							2	
Linnet*	*Carduelis cannabina*							2	13
Long-tailed Tit	*Aegithalos caudatus*	3	5				3		
Magpie	*Pica pica*	1				1	1	2	
Mallard*	*Anas platyrhynchos*	2	3						
Meadow Pipit^	*Anthus pratensis*								2
Mistle Thrush	*Turdus viscivorus*	2	1						
Moorhen	*Gallinula chloropus*	1	2						
Pheasant	*Phasianus colchicus*		P				P	P	
Pied Wagtail	*Motacilla alba*	2	1	2	2				
Redwing^	*Turdus iliacus*	7	3	4				11	
Robin	*Erithacus rubecula*	3	5	1	1	2	2	3	2
Rook	*Corvus frugilegus*	P		2	P			5	19
Siskin	*Carduelis spinus*		2				2		
Snipe^	*Gallinago gallinago*		6					2	3
Song Thrush	*Turdus philomelos*	1	P			P	P		1
Sparrowhawk	*Accipiter nisus*			1					
Starling*	*Sturnus vulgaris*	4	10	4			2	3	9
Stonechat	*Saxicola rubicola*							2	1
Teal*	*Anas crecca*		1						

Species	Scientific Name	T1 (visit 1)	T1 (visit 2)	T2 (visit 1)	T2 (visit 2)	T3 (visit 1)	T3 (visit 2)	T4 (visit 1)	T4 (visit 2)
		<100m	<100m	<100m	<100m	<100m	<100m	<100m	<100m
Tufted Duck*	*Aythya fuligula*	3							
Woodpigeon	*Columba palumbus*	5	8	4	3	8	8	6	4
Wren	*Troglodytes troglodytes*	3	4	2	1	2	4	4	3

Key ^ Red-listed species, * Amber-listed species (Gilbert *et al*. 2021).

Table 6-10. Bird species recorded outside of the dedicated transects, during ecological surveys completed at the site between June 2022 and March 2023.

Species	Scientific Name
Barn Owl^	*Tyto alba*
Black-headed Gull*	*Larus ridibundus*
Buzzard	*Buteo buteo*
Coot*	*Fulica atra*
Cormorant*	*Phalacrocorax carbo*
Crossbill	*Loxia curvirostra*
Grey Wagtail^	*Motacilla cinerea*
Herring Gull*	*Larus argentatus*
Lesser Black-backed Gull*	*Larus fuscus*
Little Grebe	*Tachybaptus ruficollis*
Raven	*Corvus corax*
Reed Bunting	*Emberiza schoeniclus*
Ring-necked Duck	*Aythya collaris*
Swift^	*Apus apus*

Key ^ Red-listed species, * Amber-listed species (Gilbert *et al*. 2021).

Table 6-11. Trail Camera Survey Results for Birds

Species	Scientific Name	Cam1	Cam2	Cam3	Cam4	Cam5	Cam6
Blackbird	*Turdus merula*	1			88	2	
Great Tit	*Parus major*		5				
Hooded Crow	*Corvus cornix*		12	3		4	2
Jay	*Garrulus glandarius*	3		1			
Magpie	*Pica pica*		17		12	37	
Mistle Thrush	*Turdus viscivorus*					1	
Pheasant	*Phasianus colchicus*			1	1		
Robin	*Erithacus rubecula*		2		36		
Song Thrush	*Turdus philomelos*				18		
Starling*	*Sturnus vulgaris*		2	13		4	
Woodpigeon	*Columba palumbus*	2	8		38		1
Wren	*Troglodytes troglodytes*				1		

Key ^ Red-listed species, * Amber-listed species (Gilbert *et al*. 2021).

Table 6-12. Bird species recorded during the ecological site walkover of the north lands on the 1st of February 2023.

Species	Scientific Name
Blackbird	*Turdus merula*
Blue Tit	*Cyanistes caeruleus*
Chaffinch	*Fringilla coelebs*
Collared Dove	*Streptopelia decaocto*
Feral Pigeon	*Columba livia f. domestica*
Goldfinch	*Carduelis carduelis*
Great Tit	*Parus major*
Hooded Crow	*Corvus cornix*

Species	Scientific Name
House Sparrow*	*Passer domesticus*
Jackdaw	*Corvus monedula*
Linnet*	*Carduelis cannabina*
Magpie	*Pica Pica*
Pied Wagtail	*Motacilla alba*
Redwing^	*Turdus iliacus*
Robin	*Erithacus rubecula*
Rook	*Corvus frugilegus*
Song Thrush	*Turdus philomelos*
Starling*	*Sturnus vulgaris*
Woodpigeon	*Columba palumbus*
Wren	*Troglodytes troglodytes*

Key ^ Red-listed species, * Amber-listed species (Gilbert *et al*. 2021).

Table 6-13. Bird species recorded for the 2km grid squares: N93X, which encompasses the study area and N93Y, O03C, O03D and W37T, overlapping parts of the proposed GNI upgrade route.

Species	Scientific Name	Grid Squares
Swallow*	*Hirundo rustica*	N93X N93Y O03C O03D
Magpie	*Pica pica*	N93X N93Y O03C O03D
Blackcap	*Sylvia atricapilla*	N93X N93Y O03C
Black-headed Gull*	*Larus ridibundus*	O03D
Blue Tit	*Cyanistes caeruleus*	N93X N93Y O03C O03D
Chaffinch	*Fringilla coelebs*	N93X N93Y O03C O03D
Coal Tit	*Periparus ater*	N93Y O03C O03D
Blackbird	*Turdus merula*	N93X N93Y O03C O03D
Bullfinch	*Pyrrhula pyrrhula*	N93Y O03D
Buzzard	*Buteo buteo*	N93X N93Y O03C O03D
Chiffchaff	*Phylloscopus collybita*	N93X N93Y
Coot*	*Fulica atra*	N93X
Kestrel^	*Falco tinnunculus*	N93Y O03C
Kingfisher*†	*Alcedo atthis*	N93Y
Moorhen	*Gallinula chloropus*	N93X N93Y O03D
Pheasant	*Phasianus colchicus*	N93Y O03D
Pochard^	*Aythya ferina*	N93X
Snipe^	*Gallinago gallinago*	N93X
Starling*	*Sturnus vulgaris*	N93Y O03C O03D
Swift^	*Apus apus*	N93X N93Y O03D
Woodpigeon	*Columba palumbus*	N93X N93Y O03C O03D
Collared Dove	*Streptopelia decaocto*	N93Y O03D
Jackdaw	*Corvus monedula*	N93X N93Y O03C O03D
Jay	*Garrulus glandarius*	N93Y
Sparrowhawk	*Accipiter nisus*	N93Y O03D
Eurasian Treecreeper	*Certhia familiaris*	O03C
Goldfinch	*Carduelis carduelis*	N93Y O03C O03D
Greenfinch*	*Chloris chloris*	N93X N93Y O03C O03D
Robin	*Erithacus rubecula*	N93X N93Y O03C O03D

Species	Scientific Name	Grid Squares
Fieldfare	*Turdus pilaris*	O03C
Goldcrest*	*Regulus regulus*	N93Y O03C O03D
Cormorant*	*Phalacrocorax carbo*	N93Y O03C
Great Crested Grebe*	*Podiceps cristatus*	N93X
Great Tit	*Parus major*	N93Y O03C O03D
Scaup^	*Aythya marila*	N93X
Grey Heron	*Ardea cinerea*	N93Y O03C O03D
Grey Wagtail^	*Motacilla cinerea*	N93Y O03C
Dunnock	*Prunella modularis*	N93X N93Y O03D
Hooded Crow	*Corvus cornix*	N93X N93Y O03C O03D
House Martin*	*Delichon urbicum*	O03D
House Sparrow*	*Passer domesticus*	N93Y O03D
Lesser Redpoll	*Carduelis flammea cabaret*	N93X N93Y
Little Grebe	*Tachybaptus ruficollis*	N93X N93Y
Long-tailed Tit	*Aegithalos caudatus*	N93X N93Y O03D
Mallard*	*Anas platyrhynchos*	N93X N93Y O03C O03D
Mistle Thrush	*Turdus viscivorus*	N93X O03C
Mute Swan*	*Cygnus olor*	N93X
Pied Wagtail	*Motacilla alba*	N93Y
Redwing^	*Turdus iliacus*	O03C
Reed Bunting	*Emberiza schoeniclus*	N93Y O03C O03D
Rock Pigeon	*Columba livia*	O03C
Rook	*Corvus frugilegus*	N93X N93Y O03C O03D
Sedge Warbler	*Acrocephalus schoenobaenus*	N93Y
Skylark*	*Alauda arvensis*	O03C
Song Thrush	*Turdus philomelos*	N93X N93Y O03C O03D
Stonechat	*Saxicola rubicola*	N93Y
Tufted Duck*	*Aythya fuligula*	N93X
Dipper	*Cinclus cinclus*	O03D
Willow Warbler*	*Phylloscopus trochilus*	N93X N93Y O03D
Wren	*Troglodytes troglodytes*	N93X N93Y O03D
Yellowhammer^	*Emberiza citrinella*	N93Y O03D

Key ^ Red-listed species, * Amber-listed species (Gilbert *et al*. 2021).

6.4.3.4 Other Taxa

The higher value and semi-natural habitats within the study area likely provide suitable habitat for a range of taxa, with the ponds considered to be particular suitable for a range of invertebrate and amphibian species. The more manicured amenity grassland, parkland and ornamental planted areas are considered to be of low value for most species.

Other taxa recorded as part of the ecological surveys of the study area include Cinnabar moth (*Tyria jacobaeae*), Meadow Brown (*Maniola jurtina*), *Bombus terrestris, Bombus lucorum* agg., Common Carder Bee (*Bombus pascuorum*), Speckled Wood (*Pararge aegeria*), Blue tailed damselfly (I*schnura elegans*), 7-Spot ladybird (*Coccinella septempunctata*), Six-spot burnet

(*Zygaena filipendulae*), *Bombus pratorum*, Ringlet (*Aphantopus hyperantus*), *Bombus lapidarius*, Small tortoiseshell (*Aglais urticae*) and Red Admiral (*Vanessa atalanta*).

Although not recorded on site during walkovers, it is likely that Common Frog, which is listed on Annex V of the EU Habitats Directive and is also legally protected by the Irish Wildlife Acts (1976 – 2012), is present.

There are no protected or Red-Listed amphibians, invertebrates or other taxa recorded by the NBDC database for the 2km grid square N93X in which the study area is located. Within the additional 2km grid squares overlapping with the proposed GNI upgrade route (N93X, N93Y, O03C O03D), there are records for the 'Endangered' Barbut's Cuckoo Bee (*Bombus* (*Psithyrus) barbutellus*), and 'Near-threatened' *Halictus (Seladonia) tumulorum*, Large Red Tailed Bumble Bee (*Bombus (Melanobombus) lapidarius*), and Small Heath (*Coenonympha pamphilus*) (Fitzpatrick *et al.* 2006, Regan *et al.* 2010). Within N96Y, there are also records for Smooth Newt (*Lissotriton vulgaris*), which is protected under the Wildlife Acts (Wildlife Act, 1976; Wildlife Amendment Act, 2000).

In the wider environment of the 10km grid square encompassing the study area (N93), the NBDC holds records for the following additional species: the 'Near-Threatened' *Andrena (Andrena) fucata*, Leafcutter Bee (*Megachile (Megachile) centuncularis)*, Moss Carder-bee (*Bombus (Thoracombus) muscorum*), for the 'Vulnerable' *Andrena (Melandrena) nigroaenea* and Field Cuckoo Bee (*Bombus (Psithyrus*) *campestris*),and for the 'Endangered' Gooden's Nomad Bee (*Nomada goodeniana*) and Wall (*Lasiommata megera;* Fitzpatrick *et al.* 2006, Regan *et al.* 2010). There are also records for Common Frog (*Rana temporaria*), which is protected under the Wildlife Acts (Wildlife Act, 1976; Wildlife Amendment Act, 2000).

In addition, the NBDC 2km grid squares through which part of the GNI upgrade route passes (O03D and O03C) hold records for Barbut's Cuckoo Bee (*Bombus* (*Psithyrus) barbutellus*), listed as 'Endangered' and *Halictus (Seladonia) tumulorum*, listed as 'Near Threatened'.

With regard to the proposed Eirgrid uprating route, the NBDC database holds records for Marsh Fritillary (*Euphydryas aurinia*) across the range of the proposed route (N53, N54, N63, N73, N83, N84, O03).

The NBDC database holds records for Desmoulin's Whorl Snail (*Vertigo (Vertigo) moulinsiana*) and Narrow-mouthed Whorl Snail (*Vertigo (Vertilla) angustior*) in the 2km grid square N93Y. Both of these non-marine mollusc species are Annex II species under the EU Habitats Directive and listed as qualifying interests of the Rye Water Valley/Carton SAC. Desmoulin's Whorl Snail is listed as 'Endangered' and the Narrow-mouthed Whorl Snail is listed as 'Vulnerable' (Byrne *et al.* 2009).

6.5 Potential Ecological Impacts

Potential ecological impacts of the project on the receiving environment are discussed below. A full description of the proposed project is provided in **Chapter 2** of this EIAR.

6.5.1 Potential Impacts on Designated Conservation Sites

A Screening Assessment report in support of the Appropriate Assessment (AA) process has been prepared and accompanies the planning application for this development.

No Natura 2000 sites are located within or directly adjacent to the proposed development site. The Rye Water Valley/Carton SAC/pNHA is the nearest designated site to the proposed

development site, located *c*. 0.96km. As previously outlined in Section 6.4.1 above, it is considered that no elements of the proposed development or the proposed GNI upgrade works are likely to result in significant impacts on the Rye Water Valley/Carton SAC.

As outlined in Section 6.4.1, there is a distant hydrological link between the proposed development site and the coastal Natura 2000 sites (South Dublin Bay and River Tolka Estuary SPA, South Dublin Bay SAC, North Bull Island SPA, North Dublin Bay SAC), and a hydrological link between the proposed development site and Liffey Valley pNHA via the River Liffey. For the reasons outlined below, it is considered unlikely that significant negative effects will arise in relation to these designated sites as a result of water quality deterioration associated with the proposed development.

The construction phase of the proposed development requires extensive earthworks to level parts of the site in order to facilitate the construction and landscaping works for the proposed development. As outlined in **Chapter 2 – Description of the Project**, it is predicted that 115,117m^3 of the cut material generated during site preparation/levelling (365,750 m^3) will be reused to facilitate construction of the proposed roads, carparks, buildings and landscaping berms. It is estimated c.250,634m^3 will be exported off the site and disposed of in accordance with relevant requirements. No fill will be required to be imported to the site to accommodate the development. The excavation, movement and storage of soil can potentially lead to the release of sediment-loaded run-off, resulting in indirect negative impacts to aquatic habitats within and immediately downstream of the proposed development site. Additionally, the proposed works associated with the culvert re-design could potentially result in sediment-loaded run-off and contamination to enter the watercourse with potential for downstream impacts. Water quality deterioration resulting in the loss and/or alteration of aquatic habitats can also potentially arise from the accidental spillage of fuel and/or oil from construction plant and vehicles, or from fuel stored for use by the back-up generators and energy centre.

As stated in Section 6.2.1, the current surface-water drainage system has existing mechanisms in place whereby surface-water run-off for Kildare innovation Campus, collected by the existing attenuation ponds, is released in a controlled manner that protects water quality downstream of the site. The existing surface water drainage regimen minimises the risk of downstream effects through impacts on water quality. The distance and dilution effect ensures that there is no likelihood of significant effects on the distant hydrologically linked sites even in the absence of the standard site management environmental controls that will be implemented at the site. No risks of likely significant effects were identified, and no bespoke mitigation measures have been required by the ecological specialists. There are construction phase environmental protection measures outlined in the CEMP (CSEA, 2023), in Section 7.6 of **Chapter 7 – Lands & Soils**, and Section 8.6 of **Chapter 8 – Hydrology**, and these are standard measures designed to minimise the risks to the immediate receiving environment. These will include for the protection of the ponds whereby excavated soil will be temporarily stored and protected in designated storage areas at least 30m from open water with no links or pathways to any open water. All pollutants (fuel, oil, lubricant, *etc*.) will be stored within bunded impermeable containers away from open water within the temporary site compound which will be located outside of the 30m pond buffer. A 30m buffer around the ponds will be maintained for the duration of the construction works period within which there will be no storage of construction material/vehicles or pollutants (fuel, oil, lubricant, *etc*.), with pollutants stored within bunded impermeable containers away from open water within the temporary site compound which will be located outside of the 30m buffer. There will be limited construction-related activity within this 30m buffer and where works are required, *e.g.,* proposed internal roads, additional water-protection measures will

be put in place. As is the case with the management of surface-water outlined above, while there will be best practice environmental controls put in place to ensure no damage to the immediate aquatic receiving environment of the Kilmacredock stream during the construction of the proposed culvert (CSEA, 2023), likely significant effects as a result of the proposed culvert works were identified, and no specific mitigation measures for the protection of the distantly connected coastal Natura 2000 sites are considered necessary. Best practice environmental controls will include for the control of run-off where silt-fences will be in place to capture silt from runoff and prevent it from entering the existing culverted stream. The proposed construction works will adhere to best practice regarding standard environmental protection as set out in CIRIA (2001), CIRIA (2002), CIRIA (2005), CIRIA (2007) and CIRIA (2015). Therefore, significant impacts on the distantly connected designated sites located downstream are not considered likely in this case.

For the operational phase, the proposed surface-water drainage system will implement an innovative and nature-based sustainable drainage system (SuDS) strategy, which complies with the requirements of Sections 15.8 of Kildare County Council Development Plan 2017-2023. The implementation of SuDS measures can be taken into account at Screening Stage. The Kelly judgement [2019] IEHC 84) clarified that "*as a matter of fact and law, that SUDS are not mitigation measures which a competent authority is precluded from considering at the stage 1 screening stage*". Note also the recent judgement (Case C-721/21) that supports the conclusion that such measures may properly be taken into at Screening Stage "*features of that plan or project which involve the removal of contaminants and which therefore may have the effect of reducing the harmful effects of the plan or project on that site, where those features have been incorporated into that plan or project as standard features, inherent in such a plan or project, irrespective of any effect on the site*". The SuDs strategy for the proposed development site will reduce surface-water run-off by utilising controls including bio-retention areas (i.e., wetland areas), attenuation ponds (proposed and existing), swales, filter drains, permeable paving and hydrocarbon interceptors. The proposed surface-water drainage system will continue to discharge to the existing ponds and will not discharge to the culverted Kilmacredock Stream. While the proposed development will result in an overall increase in hardstanding areas within the site, the proposed surface-water drainage system will result in an overall reduction in surface water discharge from the proposed development site. With regard to the storage of fuel for the back-up generators, there is full containment for bulk fuel oil, use of interceptors as part of the SuDs approach, additional dilution within the attenuation ponds and no direct pathway to surface water from this site. Taking the above into consideration, no significant negative impacts as a result of surface-water run-off to the distantly connected Natura 2000 sites located downstream are expected.

As outlined in Section 6.2.2, the existing foul water drainage network connects to the municipal sewerage network and is ultimately treated at Leixlip WWTP (Lower Liffey Valley Regional Sewerage Scheme – D0004), which has its primary emissions point in the River Liffey, upstream of the Leixlip Reservoir and the proposed development site. During the construction phase of the proposed development, welfare facilities (canteens, toilets *etc*.) will be available within the temporary construction site compound which will connect, for the duration of the construction period, to the existing four water drainage network that is currently servicing Kildare Innovation Campus (CSEA, 2023b). According to **Chapter 8 – Hydrology**, Leixlip WWTP has sufficient capacity to accommodate the existing peak foul water outflow from Kildare Innovation Campus, c. 965m3/day, as the peak hydraulic capacity of Leixlip WWTP is 65,405 m3/day and the current hydraulic loading is 50,837m3/day. During the operational phase of the proposed development, it is proposed that Leixlip WWTP will continue to treat flows from the foul water drainage network that will service the proposed development site. The latest

Annual Environmental report for Leixlip WWTP states that it is compliant with Emission Limit Values (ELVs), and "*it is considered that the discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status*" (Irish Water, 2021). The report also states that the capacity of this WWTP is not expected to be exceeded within the next three years, with a remaining organic capacity limit of 11880 PE, with the estimated PE for the operational phase of the proposed development: 2080. Taking the above into consideration, there is no likelihood for significant impact arising from the existing foul water drainage network servicing Kildare Innovation campus or from the proposed foul water drainage network for the proposed development on the distantly connected designated sites downstream of the proposed development site and Leixlip WWTP.

During the operational phase of the proposed development, the back-up generators will power the data centre in the event of an interruption to the supply of power from the National Grid. In addition, weekly scheduled testing and quarterly load-banking of all back-up generators will be carried out. As outlined in **Chapter 9 – Air Quality**, the modelling of air emissions from the site was carried out to determine the maximum number of operational hours that the back-up generators can operate, and the continuous operation of the CTGs without having a negative impact on ambient air quality as a result of nitrogen dioxide (NO2) emissions. It is noted that the air quality assessment modelled air quality using standard diesel as the standard generator emissions data sheets have not been updated to reflect the use of HVO over standard diesel. The results of the air quality modelling assessment found that ambient NO2 concentrations as a result of the proposed development are in compliance with the relevant ambient air quality limit values at all locations at or beyond the site boundary. Therefore, potential for significant effects on Natura 2000 sites arising from impacts to air quality during the operation of the proposed development are not expected.

The Screening Assessment report considers the potential for likely significant effects on Natura 2000 sites in the wider receiving environment. This includes consideration of the potential for ex-situ likely significant effects on mobile qualifying interests of designated Natura 2000 sites in the receiving environment. It is objectively concluded that there is no likelihood of significant effects on any of the Natura 2000 located in the wider area.

6.5.2 Potential Impacts on Habitats and Flora

No botanical species protected under the Flora (Protection) Order 2022, listed in the EU Habitats Directive (92/43/EEC) or listed in the Irish Red list were recorded during walkovers of the study area, and no records for such species are held by the NBDC for the 2km grid square (N93X) overlapping the study area.

As outlined in Section 6.4.2, there are records for Red-Listed and protected floral species held by the NBDC and BSBI databases for the wider environment of the 10km grid square encompassing the study area (N93), for the 2km grid squares that partially overlap the proposed GNI upgrade route (N93Y, O03C, O03D), and for the 10km grid squares overlapping the proposed Eirgrid uprating route (N53, N54, N63, N73, N83, N84, N93, N94, O03). The habitats within the site are considered to be unsuitable for these species, none of which were recorded during the dedicated habitat and botanical survey.

Apart from Sycamore, which is now considered to be naturalised in Ireland, no invasive plant species were recorded during the site walkover. No high-impact invasive species listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations have been recorded within the 2km grid square encompassing the study area (N93X). As

outlined in Section 6.4.2, the NBDC database holds records for Japanese knotweed and Canadian Waterweed, both listed on the Third Schedule, with the grid squares that partially overlap the proposed GNI upgrade route (N93Y, O03C, O03D). Neither these species, nor any other invasive species, were recorded as part of the ecological survey of the proposed GNI upgrade route.

Construction Phase

Habitats listed on Annex I of the EU Habitats Directive were not recorded within the study area.

Direct habitat loss and the alteration of habitats within the proposed development site will occur as a result of the proposed development of lands within the proposed development site boundary. In order to facilitate the proposed development, the removal of vegetation cover, tree removal, and demolition and excavation works will be required which will result in the loss of habitats outlined below.

A number of habitats that occur within the study area are considered to be common and widespread throughout Ireland, contain low botanical diversity and are considered to be of little to no ecological value to protected flora and fauna. These habitats, assessed as being of 'negligible' or 'local importance (lower value)', include the following:

- Buildings and artificial surfaces (BL3)
- Spoil and bare ground (ED2)
- Amenity (Improved) Grassland (GA2)
- Dry Meadows and Grassy Verges (GS2)
- Wet grassland (GS4)
- Ornamental/non-native shrub (WS3)
- Scrub (WS1)
- Hedgerows (WL1) (ornamental sections)
- Scattered trees and parkland (WD5) - local importance (lower value)

While Scrub (WS1) and Dry meadow and grassy verge (GS2) are typically of ecological value to a range of species such as small mammals, birds and insects, the size and condition of this habitat is such that it is considered to be of low quality, with higher quality habitat available in the wider environment. This is also the case for the more ornamental areas of Scattered trees and Parkland (WD5) habitat where the trees were immature/semi-mature and highly managed by the existing landscaping regime for Kildare Innovation Campus. Wet grassland habitat within the site occurs in small, fragmented patches that has turned rank through a lack of management and is considered to be species poor overall. The remaining habitats listed above are considered to have little to no intrinsic value in terms of local ecological importance. The buildings proposed for demolition (Buildings 7, 8, and 9) were assessed as having no intrinsic value for roosting bats or birds.

The footprint of works for the proposed development will primarily impact on these habitats, assessed as being of 'negligible' or 'local importance (lower value)'. These habitats are the most commonly found habitat type within the site, with an estimated combined area total of covering an estimated total area of over 725,000m^2, with Dry meadows and grassy verges (GS2) making up *c.* 21,3816m^2, and Buildings and artificial surfaces (BL3) making up *c.*

19,577m^2. This loss will lead to a **permanent non-significant negative impact** on habitats and flora at the site during the construction phase.

The following habitats within the study area that were assessed as being of local importance (higher value):

- Recolonising Bare Ground (ED3)/Scrub (WS1) Mosaic - local importance (higher value).
- Mixed broadleaved woodland (WD1) - local importance (higher value).
- Scattered trees and parkland (WD5) - local importance (higher value), given the maturity of the trees present.
- Hedgerows (WL1) - local importance (higher value),
- Treelines (WL2) - local importance (higher value).
- Other artificial lakes and ponds (FL8) - local importance (higher value).

As a result of the proposed development, there will be an increase of 171,641.88m^2 in hard standing (*i.e.*, artificial habitat - Buildings and artificial surfaces (BL3)) within the boundary of the proposed development site which will have a **permanent slight negative impact** on habitats and flora, particularly on the more semi-natural grassland and hedgerow/treeline habitats.

Typically, Recolonising Bare Ground (ED3) is considered to be of lower value in terms of biodiversity. In this case where it occurs in mosaic with Scrub (WS1), it has been assessed as being of higher value due to the abundance and variety of floral species recorded within such a small area, which included Orchid species. The impact of the proposed development will result in the total loss of this habitat (*c*. 4287m^2) within the site which will lead to a **permanent slight negative impact** on habitats and flora at the site during the construction phase.

Although considered to be a modified habitat comprising young uniform blocks of a small number of tree species originally created to provide screening as part of the landscaping plan developed for the existing campus, Mixed broadleaved woodland (WD1) functions as a high value habitat within the context of the proposed development site. This habitat provides foraging grounds and cover for a range of species, nesting sites for birds, and a commuting route connected to higher value habitat in the wider environment *i.e.,* the woodlands associated with Castletown House. The impact of the proposed development will result in the direct loss of *c*. 9,200m^2 of this habitat, with 66,090m^2 retained mainly along the north and northwest boundary, which will result in a **permanent moderate negative impact** on habitats and flora at the site during the construction phase.

The Hedgerows (WL1) and Treelines (WL2) within the site fulfil a similar ecological function to that of Mixed broadleaved woodland (WD1), in that these habitats are commuting corridors for species such as birds, bats and non-volant mammals to traverse the proposed development site, providing a link to foraging areas both inside and outside of the proposed development site. Further adding to the ecological value of these habitats is the presence of several large mature deciduous trees, many of which predate the existing Kildare Innovation Campus. These trees have been assessed as having 'Moderate' to 'High' roost suitability for bats, with multiple Potential Roost Features (PRFs) identified. This assessment of 'Moderate' to 'High' is also telling of their ecological value overall. These trees provide nesting sites for a range of bird species. The PRFs included dead, decaying and damaged sections of the trees which are also important habitat for a diverse range of invertebrate species, as well as mosses, fern species, fungi and lichens. In terms of species abundance, these trees can support a high level of biodiversity within a small footprint and are of particularly value when located in an

area surrounded by habitats assessed as being of lower ecological value. Where these trees are present within Scattered trees and Parkland (WD5) habitat, this habitat has been assessed as being of higher ecological value, although they have limited ecological connectivity with the wider environment in comparison to those within the hedgerow and treeline habitats. As a result of the proposed development, over *c.* 780 of Hedgerows (WL1) and over *c.* 1,130m Treelines (WL2) habitat will be permanently removed. In order to facilitate the construction of the proposed development, 535 no. trees will be permanently removed. The majority of the treeline bounding either side of the protected view corridor provides views to the Wonderful Barn to the north will be retained as part of the operational phase of the proposed development, with 22 no. trees will be removed from the treelines lining each side of this corridor. According to the 211233-PD-11 Arboricultural Report, additional trees that form 52 no. tree groups (*i.e.*, scrub, hedgerows, treeline woodland) where individual trees were not counted will also be permanently lost (Charles McCorkell, 2023). Of these trees, 56 no. trees that were assessed as being of 'Moderate' to 'High' ecological value will be lost, including 31 no. Oak trees. A further 9 no. tree groups assessed as being of 'Moderate' to 'High' value will be partially removed to facilitate the development and 1 no. tree group completely removed. This will result in a **permanent significant negative impact** on habitats and flora during the construction phase. As part of the design phase of the proposed development, the layout of the site was modified where possible in order to preserve trees assessed as being of 'Moderate' to 'High' ecological value which has resulted in the retention of 8 no. trees, including 4 no. Oak, 2 no. Lime, 1 no. Beech and 1 no. Sycamore (See Charles McCorkell, 2023).

The existing ponds recorded within the site have been classified as artificial lakes and ponds (FL8). These ponds support breeding waterfowl *(e.g.* Coot) and foraging opportunities for birds and bats and are therefore assessed as being locally important (higher value). These ponds will be retained as part of the proposed development and will not be directly lost or altered as a result of the proposed construction works, thereby preserving high value habitat for faunal species in particular.

During the construction phase, the existing surface-water drainage system, in combination with additional site-specific water protection measures including for the protection of the existing ponds will continue service the proposed development site (See **Chapter 7 of EIAR – Lands and Soils**, **Chapter 8 of EIAR – Hydrology**, and the CEMP (CSEA (2023b)). The existing foul water drainage system will continue to service Kildare Innovation Campus and will service the welfare facilities located within the temporary construction site compound. For the same reasons as outlined in Section 6.5.1, the potential impacts arising from surface-water run-off/foul water drainage to the aquatic habitats within and immediately downstream of the proposed development site during the construction phase are considered to be **neutral** in the **short-term**.

Operational Phase

There will be no additional removal of habitat during the operational phase of the proposed development, nor is there any potential for impacts on habitat and flora arising for the operational phase.

The proposed development will require the installation of the total of 2 No. attenuation basins, 2 No. attenuation ponds, 1 No. infiltration basin, as well as the retention of the 3 no. existing ponds. As outlined in Section 6.2.1 and the Landscape Architectural Master Plan (AECOM, 2023), the design of these attenuation areas will also promote biodiversity within

the proposed development area, with planting comprising native species associated with wetland and pond margin habitat. This will result in the creation of locally important (higher value) habitat that will be maintained for the lifetime of the proposed development. The proposed attenuation areas will result in the creation of habitats of higher ecological value where habitat of lower ecological value (*i.e.*, amenity grassland, dry meadows and grass verges, *etc.*) currently exists. This will result in a **Long-term moderate positive impact** on habitats and flora during the operational phase and lifetime of the proposed development.

As part of the proposed development, 1,400m (linear)of hedgerow habitat and 22,500m^2 of woodland habitat will be planted (AECOM, 2023). Planting of these habitats will comprise a mix (whips and feathered) of primarily native species of local provenance (See Drawing -KIC-ACM-XX-XXX-DR-LA-1000 for a detailed species list). Species will include trees such as Blackthorn, Hawthorn, Whitebeam, Hazel, Holly, Oak, Rowan, Birch, Scot's Pine, Willow, and Alder. The planting regime for Hedgerow will only partially replace the total loss of Hedgerow and Treeline lost as a result of the proposed development, resulting in a net loss of these habitat types. However, the planting regime for the proposed development site will replace the 9,200 m^2 of woodland habitat that will permanently removed as part of the construction phase of the proposed development and will result in the creation of an additional 13,300m^2 of woodland habitat. The planting regime will also require the planting of 1,370 specimen trees, which replaces the 535 trees permanently removed (and those additional trees lost in the tree groups) resulting in a net gain in trees for the proposed development site. This net gain in terms of landscape planting does not translate to an immediate positive impact on habitats and flora within the proposed development site during the operational phase. For a temporary to short-term period, there will be an overall reduction in vegetative cover (*i.e.,* hedgerows, treelines, woodland, stand-alone trees). In the short to medium term, it is unlikely that the vegetative cover will be of ecological value equal to that of which was removed, particularly in regard to the mature semi-natural hedgerows and treelines. In the long term, with proper maintenance over the lifetime of the proposed development, it is expected that the proposed landscape planting will result in a **moderate positive impact** on habitats and flora during the operational phase.

In addition to the planting outlined above, the landscaping plan also provides for the planting of grass seed mix of local provenance in order to cultivate species-rich grassland which will be managed for pollinators within the proposed site boundary. This will result in the planting of 155,300m^2 of pollinator friendly grassland habitat (147,000m^2 wildflower meadow, 7,800m^2 of wet grassland, 5,000m^2 swale planting). The grass seed mix used, and the management of the meadow grassland areas will follow guidance laid out by All-Ireland Pollinator Plan Business Framework. This will result in the creation of grassland habitat with great floral species diversity within a short-term period, resulting in a **slight positive impact** on the habitats and flora within the proposed development site during the operational phase. Amenity grassland (25,000m^2) and ornamental planting for the proposed plaza area (650m^2) will also be cultivated as part of the landscaping plan for the proposed development site. These habitats are of little to no intrinsic ecological value.

As outlined in Section 6.5.1, **Chapter 8 – Hydrology** and the Landscape Architectural Master Plan (AECOM, 2023), the proposed surface-water drainage system will incorporate a nature-based SuDs system of ponds and wetland areas which will control, attenuate and treat surface-water run which will ultimately discharge to the Leixlip Reservoir via the existing attenuation ponds. With the installation and operation of 2 No. attenuation basins, 2 No. attenuation ponds and 1 No. infiltration basin (17,434.8m^3 total), it is considered that proposed surface-water drainage system will improve upon the existing run-off discharge

rates from Kildare Innovation Campus (CSEA, 2023a). Therefore, the potential impacts arising from surface-water run-off to the aquatic habitats within and immediately downstream of the proposed development site during the construction phase are considered to be **neutral** to **not-significant positive** in the **long-term**.

As outlined in Section 6.5.1 above, Leixlip WWTP has adequate capacity (WWTP Remaining PE 11888) to facilitate the treatment of foul water drainage from the proposed development site (Proposed Development PE 2080) and is currently compliant with the ELV's in the wastewater discharge licence (Irish Water, 2021). Therefore, the potential impacts to the aquatic habitats downstream of the proposed development site are considered to be **neutral** in the **long-term**.

6.5.3 Potential Impacts on Fauna

The proposed development site contains habitats with ecological importance of lower to higher value for a range of protected faunal species. The site is dominated by Buildings and Artificial Surfaces (BL3) with a variety of other habitats also present including Amenity Grassland (GA2), Scattered trees and Parkland (WD5) and Mixed broadleaved Woodland (WD1). Given the variety of habitats present it is unsurprising that the campus supports a relatively diverse assemblage of faunal species.

6.5.3.1 Non-Volant Mammals

No setts, holts or dens belonging to protected non-volant mammal species were present within the study area during ecological surveys carried out as part of the proposed development. A burrow previously identified as a possible Badger sett as part of the ecological assessment that accompanied the planning application for the DB Schenker logistics facility was confirmed to be used by Rabbit in 2022 and 2023.

Rabbits are widespread and numerous at the site, particularly in areas of amenity grassland at the site. Fox sightings are signs were frequent and widely reported and although no confirmed den was encountered it is certain that Fox breed locally as young cubs were observed on the trail cameras deployed within the site.

<u>Construction Phase</u>

The construction and associated habitat clearance will permanently decrease the areas with the site that are available to burrowing and foraging non-volant mammals. The loss of hedgerows and trees will also decrease the amount of available attractive habitat for many of the species that were recorded at the site (e.g. Badger, Grey Squirrel and Red Deer). In the absence of appropriate mitigation, the vegetation clearance could impact on breeding and resting sites of mammals, even those located outside of the immediate working area.

The phased construction of the entire facility will mean that works will be staged over a prolonged period and ongoing construction related disturbance across the development area has the potential to cause localised disturbance, displacement and mortality effects on the mammals that occur locally. Construction traffic and associated visual and other sensory disturbance effects have the potential to cause localised temporary to short-term displacement and disturbance impacts upon non-volant mammal species. Increased traffic can lead to an increase in road fatalities for non-volant mammals. It could also disrupt the existing mammal community by promoting conditions which are more favourable for certain species e.g scavengers. For instance, all edible and putrescible waste (e.g. improperly

discarded food) has the potential to attract scavengers and to potentially disrupt the existing non-volant mammal community.

The construction phase will also involve demolition, substantial earthworks and increased site traffic. The buildings to be demolished are not used by any protected non-volant mammal species. However, buildings could be occupied prior to, or even during a prolonged demolition process. It will be necessary to monitor these building throughout to minimise the risk of direct impacts upon any mammal species that may be present.

Excavations and ponded water have the potential to trap, engulf or drown non-volant mammals. Construction and associated temporary fencing (and lighting) has the potential to disrupt or impede movement of mammals across the site.

During the construction phase of each phase of the development, there is likely to be a certain amount of disturbance to fauna occurring on/near the site. Given the scale of the site and the phased nature of the development the disturbance will to be some extent localised and specific to the works currently being undertaken. The greatest potential for disturbance, displacement and mortality effects will be associated with the vegetation clearance process (particularly of woodland and hedgerow habitat) ahead of the construction works of each project phase. This period will in each case be relatively concentrated and in the absence of appropriate mitigation it would be likely to have localised negative effects on the distribution and abundance of non-volant mammals at the site, in the short to medium term.

In the event that some mammals are displaced through disturbance or direct loss of habitat it is probable that many of the affected or disturbed individuals may move into adjoining lands. No burrows of protected mammal species were recorded within the application site and it appears that species such as Badger occur on site when foraging or commuting through the area.

A major run-off or pollution event could have a negative impact on the local mammal fauna through mortality and/or loss of habitat. Mammals associated with aquatic habitats (e.g. Otter) in the wider area could also potentially be subject to negative impact through activities associated with the project, such as siltation, run-off and fuel spills. The proposed development site is not directly adjacent to the sensitive riparian corridors and the existing surface water management control make significant ex-situ impacts on water quality highly unlikely. It is possible that contamination of the 'ponds' on site could have a temporary negative impact on non-volant mammal species that utilise these waterbodies as a source of freshwater or for occasional foraging opportunities. However, as described in Section 6.5.1 above and detailed in the CEMP and **Chapter 8 – Hydrology** there are comprehensive mitigation commitments that will be effective in minimising the risk of any significant contamination of local waterbodies or hydrologically connected watercourses.

The non-volant mammal community at the existing site is not particularly diverse or abundant, but it is important in a local context. In the absence of adequate mitigation and biodiversity enhancement measures it is likely that the proposed development would have a significant negative impact on the non-volant mammal community present at the site. However, the impact is likely to be highly localised in extent and occur in the short-to-medium term. The permanent loss of habitat will be addressed by the landscaping and other biodiversity enhancement measures. The benefit of these measures will not all be instantaneous and as the project is phased the localised negative impacts (loss of habitat and disturbance) will be offset to an extent by the establishment and growth of the new landscape features.

Therefore, over the course of the project, the enhanced newly established habitats in earlier phases will be available to non-volant mammals that occur locally. That is likely to substantially lessen the potential impact to overall species diversity and abundance associated with the clearance of vegetation and construction activity in later stages of the development.

Operational Phase

As described above the proposed development will be phased and there will be elements of the project that are in place for at least a decade prior to the delivery of the final planned features. It means that the construction phase is extended into the operational phase and so the potential impacts of both construction and operational phases also overlap.

The maturing landscape features including 1,400m of linear hedgerow and 22,500m^2 of woodland will provide cover for foraging commuting and resting mammals. This will in the medium to long term be likely to see a moderate positive impact on the diversity and abundance of non-volant mammal species present at the site. Features with the potential to have moderate to significant positive effects in the shorter term include the planting and management of pollinator friendly grassland. These higher value grassland habitats will be attractive for small mammals and for foraging larger mammals.

The larger footprint of the built areas on site and associated increases in site traffic (and noise and lighting) is likely to be offset by the maturing landscape features in the long term leading to slight positive impacts on the diversity and abundance on non-volant mammals present in the area.

6.5.3.2 Bats

Construction Phase

The KIC campus is an existing large and landscaped site on the outskirts of Leixlip. It has large areas of built and managed habitats. The new proposed development is to be located within an area where there are already sources of artificial lighting, busy roads and many houses and gardens.

The buildings to be demolished to facilitate the development are not used by, or suitable for, roosting bats. The areas with greatest resource value for bats within KIC are around the existing ponds and areas of mature hedgerow and woodland.

Surveys conducted across multiple seasons confirmed the presence of five bat species won site, with Soprano Pipistrelle, Leisler's Bat, Common Pipistrelle, Daubenton's Bat and Brown Long-eared Bat present. No confirmed bat roost was located at the site. Ground-level assessments of the trees to be removed found that the majority of these has negligible to low suitability of roosting bats. However, there were 56 no. trees which are to be felled to facilitate the development which were assessed as having 'Moderate' to 'High' roosting suitability for bats. These trees are distributed throughout the development footprint and include some large mature and over-mature Oak, Beech and Lime. The removal of the young trees with no current suitability for roosting bats, along with the removal of the trees with moderate to high potential has the potential to result in a decline in the current and future resource value of the site for commuting, foraging and roosting bats. It is likely that among the trees with moderate to high potential that some bats may use suitable PRFs to roost. In

Ireland, the majority of bat roosts are in buildings while outside Ireland, known roosting associations of certain bat species can be markedly different. For instance, in Europe Leisler's bat is considered to be highly dependent on tree roosts, whereas, in Ireland, tree roosts remain rarely recorded (Marnell & Presetnik, 2010). However, all Irish bat species have been recorded using tree roosts, at least occasionally (Roche *et al*. 2014). Therefore, without mitigation the loss of trees, particularly mature trees, at the site has the potential to remove roosting opportunities, displace, or even result in mortality of bats. Without appropriate mitigation, the risks associated with tree-felling would be greater and likely to result in much higher risk of disturbance, injury and death of roosting bats. Even in the event that no roosting bats are present in any of the trees at the time they are felled, the removal of the mature trees has the potential to result in locally reduced foraging opportunities and/or interrupt commuting routes.

Construction related lighting has the potential to cause localised disturbance and to cause avoidance of well-illuminated areas by a proportion of species known to be less tolerant of artificial lighting e.g. Brown Long-eared Bat.

There are elements of the project design which may be attractive to foraging bats such as the installation of the attenuation pond and attenuation wetland areas. Elsewhere on site the three existing ponds are hotspots of activity for foraging bats including Daubenton's Bat and it is likely that the new pond area will also be attractive for bats, to forage and to drink. Similarly, the new grassland management (species-rich grassland) is likely to be of benefit to foraging bats. Green walls/roofs may provide some foraging opportunities for bats and have been shown to have a benefit for bats in urban areas (e.g. Pearce & Hawkins 2012). Biodiverse roofs and living 'green' walls are both recommended design features in Bat Conservation Trust's publication on Landscape and Urban Design (Gunnell *et al*. 2012).

As described in Section 6.5.3.1, the construction phase will be phased and that will mean that the vegetation clearance and implementation of the landscaping strategy will also be phased. It means that for some of the trees that currently have potential for roosting bats may well have fallen or become less attractive by the passage of time before they are finally scheduled for removal. Likewise, there may be trees that are currently adjudged as having lower potential that may become attractive for roosting bats, or even or more value for commuting and foraging bats in the intervening decade. Therefore, just as bats may use natural features in a very different way at different times of year, a precautionary view must also be applied in assessing the potential for the trees present to be of value to bats, currently and prior to their removal. In the absence of mitigation, the loss of hedgerow and mature trees is likely to result in significant negative effects on bats in the local area in the short to medium term. The introduction of the newly planted trees, hedgerows, managed grassland, surface water attenuation features and green roof/walls has the potential in time to have an overall slight positive effect on foraging bats present at the site. However, without further mitigation the roost potential of the site will be significantly reduced into the longer term.

Operational Phase

The maturing landscaped features are likely to be of increasing value for locally occurring bats. The planted trees and hedgerows will take time to be of significant value to bats but these will provide in the medium to long term commuting and foraging habitat of local importance. The long term to permanent effect of the planted woodland and hedgerow will be significant positive at a local level as the trees mature and offer greater potential for foraging and

roosting bats. The larger trees and woodland patches will also help screen areas from artificial lighting.

The species rich grassland areas and areas for attenuation of surface water will also continue to be of local importance for foraging bats at the site.

The lighting from buildings and lamp standards within the campus has the potential to cause some localised avoidance of these areas by less light tolerant species and to attract in certain species (e.g. Leisler's Bat) that are adept at opportunistically foraging in areas where insects are attracted. In the context of the existing site the predicted impact of the additional lighting that may be associated with the additional buildings and infrastructure is likely only to represent a slight negative effect on locally occurring bats. It is also noted that the Guidance Note on Bats and Artificial Lighting (GN 08/18 [2018]) published by Institution of Lighting Professionals and Bat Conservation Trust (2018) formed part of the design information drawn upon for the lighting design for the project (Refer to Ethos, External Lighting Design Report for further detail).

6.5.3.3 Birds

Construction Phase

The bird surveys at the site recorded a relatively diverse winter and breeding bird community. The construction of the proposed development will require the demolition of three large industrial buildings, removal of over 500 trees and areas of hedgerow and grassland habitat. In the absence of mitigation the vegetation clearance has the potential to disturb, displace and cause mortality of breeding and roosting birds. The vegetation clearance is likely to reduce the foraging, breeding and roosting potential of the site for many of the species that currently use the site. The hedgerow and tree removal must be seen in the context of the retention of large numbers of trees on the campus and the availability in the wider area of similar suitable nesting habitat.

Given that a proportion of the trees to be removed are mature broadleaved trees that are very attractive for nesting and roosting birds the likely effect of the removal of trees on the local bird community is moderate to significant negative in the short to medium term. Avoiding clearance of vegetation in the bird breeding season will be effective in reducing the potential effects of the clearance to moderate negative and localised in the short to medium term.

Construction activity will involve movement of plant and personnel and associated sources of potential disturbance. This is likely to cause local displacement of certain bird species and to result in a localised decline in species diversity and abundance. Increased site traffic has the potential to cause localised disturbance and to increase the risk of mortality through collision with vehicles and structures.

The buildings that are to be demolished (7, 8 & 9) are not used by breeding birds. On occasion, gulls, both Herring Gull, *Larus argentatus* and Lesser Black-backed Gull, *Larus fuscus* were observed on the rooftops of these buildings. However, there was no evidence of resident nesting pairs. The rooftops are subject to regular maintenance checks and this may be making it less likely that gulls are choosing to nest in regularly trafficked areas.

The existing ponds on site are a locus of avian biodiversity with several waterbird species present at all times of the year. A number of species use the ponds to breed including Coot

and Mallard. Mute Swans have bred on these ponds in previous years. It was noted also that species such as Swallow and Swift were observed foraging over the ponds at the site. The retention of these ponds and addition of the new attenuation ponds and wetland attenuation areas are likely to have a positive effect on the abundance and diversity of waterbirds and hirundines present at the site.

As discussed in relation to potential construction related impacts on other fauna, the proposed development is phased over a long period and therefore the construction related disturbance is likely to be highly localised within the campus. There is potential for attraction of scavenger species into areas where edible and putresible wastes are improperly discarded. Additional lighting has the potential to cause disturbance of birds present in the illuminated areas.

The new landscaping features include substantial new areas of woodland planting (c. 22,500m^2) and c. 1,400 linear metres of new hedgerow planting. In the short to medium term this new planting will be of limited attractiveness to breeding and roosting birds. From the medium to longer term these areas of planting will have a local moderate positive effect on the avian biodiversity at the site. The areas of managed species rich grassland are likely to have more immediate benefit to species including granivores (e.g. Linnet).

Overall, in the absence of appropriate mitigation, the construction phase of the project is likely to result in slight to moderate negative effects on avian diversity and abundance at the site.

Operational Phase

In the operational phase, as the landscaping features mature, the planted areas are likely to yield a neutral to slight positive impact on the local bird community over the medium to long term. As described above, in the short-medium term the loss of mature vegetation is like to see slight to moderate negative effects on avian diversity and abundance at a highly localised level within the site, but this effect will not be long-term.

The green roofs may provide attract roosting and nesting opportunities for certain species (e.g. Gulls) and as described in the Mitigation and Enhancement section (Section 6.6) there are several measures that will be applied to reduce the potential effects arising from the vegetation clearance and to accelerate and grow the biodiversity benefits arising from the landscaping and other mitigation commitments.

6.5.3.4 Other Taxa

Construction Phase

No protected or Red-Listed amphibians, invertebrates or other taxa were recorded at the site. The removal of trees, hedgerow and grassland areas during construction are likely to cause localised disturbance and losses of invertebrates.

In general construction activities have the potential to impact upon aquatic habitats at and downstream of the site through hydrological links from the works areas. This can negatively impact the biodiversity of the waterbodies by causing a decline in the diversity and abundance of aquatic insects and a knock-on effect on the higher trophic levels. The CEMP contains detailed measures to ensure that the risks of contamination of the ponds and hydrologically connected watercourses is minimised.

The management of grassland areas in accordance with the All-Ireland Pollinator Plan will yield a local significant positive benefit to other taxa in the short term and into the future. The new pond and attenuation wetlands are likely to have a significant local positive effect on other taxa from the short term.

Operational Phase

The landscaping plan includes for the planting of 1,400 linear metres of new hedgerow and some 22,500m^2 of woodland habitat with 1,370 specimen trees. These measures are likely to be of slight to moderate positive benefit to other taxa, particularly invertebrates, in the short to medium term. In the longer term the maturing woodland is likely to have a significant positive effect on the diversity and abundance of invertebrate fauna at the site.

The green roofs and walls will support a diversity of invertebrate species. The ongoing management of species rich grassland will have an ongoing significant positive effect on the diversity and abundance of other taxa, particularly invertebrates.

6.5.4 Facilitation Works

As stated in Section 6.2 above and **Chapter 2 – Description of the Project,** the facilitation works (*i.e.,* the Eirgrid uprating works and the proposed GNI upgrade works) which are included in the project do not form part of the proposed development for which consent is sought but are required in order to support the proposed development.

Proposed Eirgrid Uprating Works

As outlined in Section 6.2 above and in **Chapter 2 EIAR – Description of the Project**, the proposed uprating will be carried out to existing lines along established wayleaves that primarily cross agricultural lands. While the uprating works traverse a considerable distance, it is existing linear infrastructure that is being upgraded, where the nature of the works are temporary. Therefore, the potential for impacts upon the receiving environment are greatly reduced.

There will be no additional ground works required, as existing access roads will be used to complete the uprating works, the existing foundation will be utilised where pole sets must be replaced, and the works comprise the uprating of overhead lines where no excavation works will be required. While access roads will need to be maintained, this is an on-going requirement.

The uprating works will follow the standard methodologies outlined in '*Ecology Guidelines for Electricity Transmission Projects'* (Eirgrid, 2020). For example, the works will be timed to avoid periods of heavy rainfall and there will be protocol in place to prevent the spread of invasive species.

The overhead transmission lines that form part of the proposed uprating works cross watercourses. However, no instream works will be required. Furthermore, the replacement of polesets and upgrading of towers (where required) will use existing infrastructure (access roads, foundations, *etc*). The proposed Eirgrid uprating route crosses the Rye Water River and associated Rye Water Valley/ Carton SAC/pNHA. No ground works within these designated sites will be required. The proposed route will also cross Carbury Bog NHA and Royal Canal pNHA. While there is potential for works (the replacement of polesets, upgrading of towers) within these designated sites associated with the project, given the temporary nature of the

works and the use of existing infrastructure, significant impacts to these designated sites as a result of these facilitation works are not expected.

With regard to the proposed Eirgrid uprating works and the proposed GNI upgrade works, we have considered the information provided on the proposed facilitation works, including the nature, location and scale of the Eirgrid uprating. Based on this information and the location of Natura 2000 sites in the receiving environment, it is concluded that no likely significant effects will arise in relation to these associated facilitation works. Future consent for the facilitation works will be required through Gas Networks Ireland and Eirgrid which will include the submission of a Screening Assessment report in support of the Appropriate Assessment process and the submission of an Environmental Impact Assessment.

Proposed GNI Upgrade Works

The preferred route of the proposed GNI upgrade works is not within any designated site. The nearest designated sites to the proposed GNI upgrade route are the Rye Water Valley/Carton SAC and pNHA which is located 179m to the northeast, separated by suburban development, greenfields and treelines. The preferred route does not cross any watercourses, therefore there is no direct hydrological link connecting the proposed GNI upgrade route to the Rye Water River and associated designated sites, nor to other designated sites present downstream.

Habitats listed on Annex I of the EU Habitats Directive are not present within the preferred route of the proposed GNI upgrade works, nor does the route cross any watercourses. Buildings and artificial surfaces (BL3), and recolonising bare ground (ED3) are the main habitats which will be directly impacted by the proposed GNI upgrade works. These habitats are considered to be of little to no intrinsic value to native flora and fauna. No invasive plant species were recorded along the route during ecological surveys but should they occur during the construction phase, there will be measures in place to prevent the disturbance and spread of invasive plant species (See the sample GNI Construction and Environmental Management Plan in Appendix 6.1 for more information).

There will be no additional removal of habitat during the operational phase of the proposed GNI upgrade works and there is no potential for impacts on habitat and flora arising for the operational phase of the proposed GNI upgrade works.

The proposed works will be limited to the corridor (*c*. 1.18km) of the proposed GNI upgrade route and will be temporary in nature. The effected highly modified habitats will be returned to their original state following completion of works. No watercourses will be crossed in order to facilitate the proposed works. Additional environmental protection measures as outlined in Section 6.2 and Appendix 6.1 (Sample GNI CEMP) will be in in place and specific to the proposed GNI upgrade route. As a result, it is considered likely that impacts to habitats and fauna will be **temporary** and **neutral** to **imperceptible**. Additionally, no significant impacts to the to the relevant designated sites are expected. However, future consent for these works will be required through Gas Networks Ireland which will include the submission of a Screening Assessment report in support of the Appropriate Assessment process and if required the submission of an Environmental Impact Assessment.

6.5.5 Do-Nothing Scenario

If the proposed development does not proceed, the existing operations of the industries outlined in Section 6.1.2 within Kildare Innovation Campus, associated use of the car-parking areas and access roads, and landscaping regime will continue. As part of the landscaping regime, the campus grounds will continue to be managed for pollinators as part of the All-Ireland Pollinator Plan Business Framework.

In the short to medium term, 8 no. trees that form part of the hedgerow, treeline and parkland habitats assessed as being locally important (higher value), as well as being assessed as of 'Moderate' to 'High' suitability for bats (and of ecological value in general), are in such condition that they cannot be realistically retained in the context of the current land use (See Charles McCorkell, 2023). These trees have been assessed where the structural and or physiological condition of the tree is poor and is therefore at risk of falling, or the tree is dead or dying. In the long term, the remaining trees/tree groups considered to be of Moderate' or 'High' value have an estimated remaining life expectancy of at least 10 years (21 no. trees/tree groups), 20 years (24 no. trees/tree groups), or 40 years (15 no. trees/tree groups). There are little to no young trees, either planted or self-seeded, to replace these older trees when they inevitably fall.

6.5.6 Cumulative Impacts

Cumulative effects are defined by EPA Guidance (2017) as; '*the addition of many minor or significant effects, including the effects of other projects, to create larger, more significant effects*'. An assessment of plans and projects occurring in within the proposed development site boundary and within the wider landscape were evaluated in combination with the project. A review of permitted developments in the wider area was completed (see **Chapter 3 - Planning and Development Context** and Appendix 3.1), and the potential for any significant cumulative and in combination effects on the receiving environment were considered for the construction and operational phases of the proposed development below.

The plans and projects that have been proposed or implemented in recent years were considered as part of the assessment of potential cumulative and in combination effects. For instance, the current Kildare County Development Plan (2023-2029) was adopted in December 2022. In addition, the Leixlip Local Area Plan (2020-2023) and the Celbridge Biodiversity Action Plan (2021 – 2025) were also considered in relation to the local ecology and planned actions for the protection and restoration of local biodiversity.

There are several mechanisms by which projects in general may act in concert with each other to impact on the local flora, fauna and habitats in a given area. The scale at which these impacts may be felt depends greatly on the nature of these projects and the type of species and habitats in the receiving environment. Loss of habitat associated with a particular project may be exacerbated by multiple similar losses of habitat occurring in the wider area. Increases in noise or lighting from one project can have greater impact if the loss of screening vegetation associated with a neighbouring development allows for a wider cumulative 'spill' of impacts into the wider environment. Similarly, if pressures arising from the connection to wastewater services by multiple projects being developed means that the capacity of local wastewater treatment infrastructure is overwhelmed, the potential for downstream cumulative impacts must be considered. There are also potential positive cumulative effects that can be associated with the delivery of unrelated projects. For instance, if these projects cumulatively increase the amounts of a certain habitat attractive for species of importance and through their own landscaping commitments help improve the ecological connectivity through the wider area.

There are several developments that have either been submitted for planning permission or have been granted permission within and in close proximity to the proposed development site. The client, The Davy Platform ICAV, received planning permission for the development of 4 no. 20 kV ESB double substations at four sites within the proposed development site (planning ref: 22/1096). The location of these substations is within habitats considered to be of low ecological value (Buildings and artificial surfaces (BL3), *etc*.) and cover a total floor area of 591m^2. Given the location of the substations, the scale of the works required and the type/condition of the habitats in which the substations will be located, no significant impacts in combination with the project are expected. Barnhall Rugby club received permission (Planning Ref. 21/730) for the construction of a new vehicle access and all ancillary works. The site is directly adjacent and overlaps in places, with the proposed development site boundary to the south. In combination effects between this development and the proposed development are not expected to result in significant impacts. Glenveagh Development (Planning Ref 23/513), a large scale residential development is located northeast of the proposed development site, opposite the entrance to the Barnhall Meadows estate. The site primarily comprises agricultural grassland bounded by hedgerows and treelines that provide commuting corridors for various species to habitats in the wider environment. A Screening for Appropriate Assessment and the Biodiversity chapter of the EIAR completed by Enviroguide Consulting (2023) found that "*no significant negative impact to any valued habitats, designated sites or individual or group of species as a result of the proposed development*".

As outlined in **Chapter 3 - Planning and Development Context**, the Wonderful Barn lands are likely to be the subject of a regeneration project including the restoration of the main features of the complex and its historical landscape by Kildare County Council in the foreseeable future. The Wonderful Barn is directly adjacent to and overlapping with the lands north of the M4 within the proposed development site boundary. Given the estimated time period in which the different stages of the proposed development are going to be completed, there is potential for in-combination effects on the habitats and flora between this project and the proposed development. This project will require the submission of a Screening Assessment report in support of the Appropriate Assessment process and the submission of an Environmental Impact Assessment.

There are a number of large-scale developments in the wider area that have the potential to interact with the project, resulting in in-combination and/or cumulative impacts in the receiving environment. Several of the notable projects are discussed below.

Intel Ireland Limited were granted planning permission for the revised design of their manufacturing facility in May 2017 (Planning Ref: 16/1229 amended under reg. ref. 1991). The facility is located *c.*1.5km north of Kildare Innovation Campus, and the granted revised design is currently under construction. The original Natura Impact Statement completed by Environmental Impact Services (2016), found that wastewater discharged to Leixlip WWTP would remain inside the licensed limits for the facility and have a negligible impact on the River Liffey. The Natura Impact Statement submitted for the amended planning application (Planning Ref: 1991) takes into account the environmental protection policies outlined in the Kildare County Development Plan 2017-2023 and Leixlip Local Area Plan 2017 – 2023 and states that "*the proposed development itself will not have any effects on the conservation objectives of any European sites*" (Scott Cawley, 2019). The Intel campus has been developed over a number of phases and has had to implement stringent design and environmental controls, particularly as it is located directly adjacent to the Rye Water Valley/Carton SAC.

These include management of surface water and wastewater in accordance with EPA licence requirements, as outlined. Several development projects at this facility have been subject to the Appropriate Assessment process. Having considered the location and design of the Intel facility, no interactions resulting in significant cumulative effects upon the receiving environment in relation to the Intel development and the proposed development are expected. We have also considered the potential for cumulative effects arising between the Intel Facility and the proposed facilitation works *i.e.,* the proposed Eirgrid uprating works and the proposed GNI upgrade works, that will be required as part of the current project. While the overhead transmission lines traverse the Intel facility, the uprating works are highly localised, temporary and of a nature that no potential for significant cumulative effects upon the receiving environment in relation to the Intel development and the proposed development are expected.

Irish Water have applied for permission to upgrade Leixlip WWTP which would involve the demolition of the existing workshop and activated carbon building, and the construction of a new Sulphuric Acid Storage and Dosing Facility (Planning Ref: SD21A/0272). The site of the proposed works is located in proximity to the River Liffey, on the opposite bank to the proposed development site, less than 1km form the proposed development site. There were no interactions between the proposed works and any designated Natura 2000 site identified (Ryan Hanley, 2021). No interactions resulting in significant cumulative effects upon the receiving environment in relation to this WWTP upgrade and the proposed development are expected. With regard to the facilitation works *i.e.,* the proposed Eirgrid uprating works and the proposed GNI upgrade works, we have considered the information provided on the proposed facilitation works, including the nature, location and scale of the GNI upgrade and Eirgrid uprating. Based on this information, no interactions resulting in significant cumulative effects upon the receiving environment in relation to the Leixlip WWTP upgrades and the facilitation works are expected.

A 10-year planning permission was granted for a c. 47.44 ha Solar Farm development (Planning Ref: 18250) in Killeenlea, Co. Kildare, located to the southwest of the proposed development site. The Screening report in support of the AA process completed by Scott Cawley (2018) stated that there is no pathway linking to designated sites upstream. Given this and the distance of this site from the proposed development site, no interactions resulting in significant cumulative effects upon the receiving environment in relation to this solar farm development and the proposed development are expected. With regard to the facilitation works *i.e.,* the proposed Eirgrid uprating works and the proposed GNI upgrade works, we have considered the information provided on the proposed facilitation works, including the nature, location and scale of the GNI upgrade and Eirgrid uprating. Based on this information, no interactions resulting in significant cumulative effects upon the receiving environment in relation to this solar farm and the facilitation works are expected.

The DART+ West project (ABP ref: NA29S.314232) is seeking permission to significantly increase rail capacity on the Maynooth & M3 Parkway lines. The route of this project passes to the southeast of the proposed development site, opposite the Leixlip Reservoir. The Natura Impact Statement completed by IDOM and ROD on behalf of CIÉ (2022) found that "*given the full and proper implementation of the mitigation prescribed in this NIS, the proposed development, either individually or in combination with other plans or projects, will not adversely affect the integrity of the Rye Water Valley/Carton SAC, the South Dublin Bay and the River Tolka Estuary SPA, the North Bull Island SPA or any other European site*". Having considered the nature and scale of the Dart+ West project and the environmental commitments provided for in the EIAR and NIS, we conclude that there is no potential for

interaction resulting in significant cumulative effects with the current proposed KIC development. We have also considered the potential for cumulative effects arising between this project and the proposed facilitation works *i.e.,* the proposed Eirgrid uprating works and the proposed GNI upgrade works, that will be required as part of the current project. The overhead transmission lines that form part of the Eirgrid uprating route traverse the Dart+ upgrade route. For the same reasons as outlined above, no potential for significant cumulative effects upon the receiving environment in relation to the Intel development and the proposed development are expected.

There are several large residential developments that have been granted permission in the wider environment of the proposed development (See Appendix 3.1). These developments and other active sites in the wider area are to be seen in the context of a well-developed urban infrastructure with appropriate planning, monitoring, and licensing in place.

6.6 Avoidance Mitigation & Enhancement Measures

6.6.1 Avoidance

Through an iterative design process opportunities to reduce the potential for impacts on the local biodiversity were explored. This included reducing the number of mature higher value trees to be removed insofar as possible and seeking to implement tree protection measures as part of the CEMP. Direct impacts on areas where there are existing bird and bat boxes within the campus were successfully avoided. The lighting design has also taken the guidance on impacts of artificial lighting on bats into account.

6.6.2 Mitigation

The following mitigation measures will be applied to minimise the potential impacts identified on the receiving and wider environment.

- A suitably qualified Ecological Clerk of Works will be appointed for each phase of the construction of the project to ensure the full and proper implementation of the mitigation strategy.
- There will be no tree or hedgerow removal within the bird breeding season (1st March to 31st March inclusive).
- Any areas where vegetation removal or construction activity is due to commence will be subject to a pre-works survey by a suitably qualified ecologist. In the event that there are any protected species present works will only be permitted to proceed on the advice of the ecologist and with any required derogation licensing in place.
    - All trees judged to have moderate or high roost potential for bats will be subject to a detailed inspection, including as appropriate tree-climbing (and/or roost emergence surveys) in the weeks prior to planned felling. In the event that there is evidence of a presence a roosting bats no felling will take place without a derogation licence. A bat specialist will liaise with the licensing unit and local NPWS staff and implement an agreed management protocol ahead of the commencement of felling. The bat specialist will be present during any subsequent felling and will inspect the felled trees before they are logged or removed.
    - Areas where construction is scheduled will be surveyed in advance to check for the presence of Invasive Plant Species. In the event that any Third Schedule Invasive Plant species are present an Invasive Species Management Plan will be prepared and implemented ahead of the removal of vegetation from the affected area.
- All soil removed from the site will be disposed of at approved licenced facilities.
- All environmental controls described in the CEMP and elsewhere in the EIAR will be integrated into a live CEMP which will be regularly reviewed and updated as appropriate during the construction phase.
    - Root protection zones will be marked and appropriate exclusion of vehicles and personnel will be in place to ensure that disturbance to habitats adjoining construction sites is minimised.
- The proposed Landscaping Plan (AECOM 2023) will be implemented in full.
    - If soil is imported to the site for landscaping, infilling or embankments, the contractor shall gain documentation from suppliers that it is free from invasive species.

- Construction operations will take place during the hours of daylight for the most part to minimise disturbances to roosting birds or any active crepuscular/nocturnal bird species.
- A Toolbox Talk will be prepared and incorporated as part of the construction phase site induction. A wildlife register will be maintained by the environmental site staff during the construction phase. Site staff will be encouraged to report any wildlife sightings of note made during the construction phase and this information will be logged by the environmental site staff. The site manager will continue to maintain a wildlife register throughout the operational phase.
- The construction footprint will not be lit at night (with the exception of low-level switchable safety lighting). All lighting systems will be designed to minimise nuisance through light spillage. Shielded, downward directed lighting will be used wherever possible and all non-essential lighting will be switched off during the hours of darkness.
    - Where possible all light fittings will be LED, have asymmetrical projection i.e. directional, and with colour temperature of 2700K (warm spectrum preferred by bats). The radiation will be above 500nm to avoid the blue or UV light, most disturbing to bats.
- All edible and putrescible wastes will be stored and disposed of in an appropriate manner. Similarly, all construction materials will be stored and stockpiled at prescribed locations and all waste materials will be disposed of to licensed facilities.
- All edible and putrescible wastes will be stored and disposed of in an appropriate manner. Similarly, all construction materials will be stored and stockpiled according to the CEMP.
- Areas where spoil is to be stored temporarily, or permanently, will be checked in advance for the presence of Frogs (and spawn) or other protected species. Any areas with pooled surface water, shall be checked in advance for the presence of Frogs (and spawn). If protected species are present, the environmental staff will translocate these, if possible (under licence if applicable). The same measure should be applied for any drains or areas of standing water forded by construction machinery. These areas will be checked on an ongoing basis by the ECoW and any areas with breeding frogs, spawn or tadpoles will be mapped and if possible fenced off temporarily to allow Frogs to metamorphose. If such areas cannot be avoided by site traffic the environmental staff will translocate the frogs (adults/young) under licence if applicable.
    - If other taxa such as other species of Lepidoptera, Common Lizard etc. are recorded within or adjacent to the site these sightings will be logged on a wildlife register.
- All excavations, or areas with pooled water will be checked regularly by the ECoW. Access/egress boards will be provided in the event that any excavations are to be left open or accessible to fauna for any prolonged period. A protocol for dealing with any trapped or injured wildlife will be developed as part of the construction phase environmental management plan including information regarding local veterinary care and local NPWS staff. The ECoW will prepare information on treatment of wildlife and emergency procedures which will be included as part of the site induction process.
- Any newly installed perimeter fencing will have a gap of c. 200mm at the base, or regular mammal gates (at maximum 150m intervals), to allow the free passage of terrestrial mammals through the site.

6.6.3 Enhancement Measures

- A minimum of 75 bird nest boxes will be erected within the campus lands. These will include a selection of woodcrete or recycled plastic nest boxes. It will include the following:

  - Two Barn Owl boxes site on poles at 4-6m above ground level and sited with input from a suitably qualified ecologist.
  - 12 Swift boxes/bricks that will be integrated into the buildings on-site. These will be equipped with a tape lure (under licence) that will help attract Swifts to the nesting location(s).
  - A selection of nest box types including cavity nest boxes will be erected at locations chosen by a suitably qualified ecologist.
  - A nesting/roosting raft will be installed on one of the ponds at the site under the supervision of the ECoW. This will be designed according to the RSPB Guidance (https://www.rspb.org.uk/our-work/conservation/conservation-and-sustainability/advice/conservation-land-management-advice/nesting-rafts/).
  - The bird nest boxes will be checked and cleaned by a suitably qualified ecologist on an annual basis and any boxes requiring repair or replacement will be done so promptly on the advice of the ecologist.
- A minimum of 50 bat boxes will be erected and maintained within the campus. These will include a selection of roosting box designs and be selected and erected under the supervision of a bat specialist.
  - The bat boxes will be checked by a suitably qualified and licensed ecologist on an annual basis and any boxes requiring repair or replacement will be done so promptly on the advice of the ecologist.
- A biodiversity audit of the site will be carried out every five years and the findings will inform a Biodiversity Management Plan for the site for the following 5-year period. This will capture the elements of the landscaping and ecological mitigation, monitoring and enhancement (including the measures undertaken as part of the AIPP) and set goals and objectives for the next plan. The audit will look at the biodiversity on site and the progress towards previously stated objectives. The BMP and biodiversity audit will be published and feedback will be welcomed. The first BMP will be prepared ahead of the commencement of construction activity.

6.7 Residual Impacts

With the implementation of the environmental controls, mitigation and landscaping commitments it is likely that the overall impacts on biodiversity at the site will be locally slight to moderate negative in the short to medium term but that with the maturation of the landscaping measures and ongoing commitment to biodiversity management that it is predicted that the longer term impacts on local biodiversity arising from the proposed development will be locally moderate positive.

The Screening Assessment report that accompanies this EIAR considers the potential for likely significant effects on Natura 2000 sites in the wider receiving environment. This also includes consideration of the potential for ex-situ likely significant effects on mobile qualifying interests of designated Natura 2000 sites in the receiving environment. It is objectively concluded that there is no likelihood of significant effects on any of the Natura 2000 located in the wider area.

6.8 References

AECOM (2023). Landscape Architectural Master Plan Design Report: Kildare Innovation Campus, Leixlip, County Kildare.

Bang, P. & Dahlstrom, P. 2004. Animal Tracks and Signs. Oxford University Press, Oxford.

Bibby C., Burgess N., Hill D. and Mustoe S. 2000. Bird Census Techniques. Academic Press, UK.

Blackthorn Ecology (2016), Confey Solar Farm: Ecological Report.

Byrne, A., Moorkens, E.A., Anderson, R., Killeen, I.J. & Regan, E.C. (2009). Ireland Red List No. 2 – Non-Marine Molluscs. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Charles McCorkell Arboricultural Consultancy (2023). Tree Survey, Arboricultural Impact Assessment & Arboricultural Method Statement: Kildare Innovation Campus Co. Kildare.

CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors, (C532) Construction Industry Research and Information Association.

CIRIA (2002) Control of water pollution from construction sites: guidance for consultants and contractors (SPI56) Construction Industry Research and Information Association.

CIRIA (2005), Environmental Good Practice on Site (C650); Construction Industry Research and Information Association.

CIRIA 697 (2007), The SUDS Manual.

Clark, M. 1988. Badgers. Whittet Books, London.

CSEA (2023a). Engineering Services Report Drainage and Water Services: Kildare Innovation Campus.

CSEA (2023b). Construction Environmental Management Plan Kildare Innovation Campus.

Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

Ecology Ireland (2022). Pre-construction phase Ecological Advice & Monitoring 2021: DB Schenker Site, Leixlip, Co. Kildare

Eirgrid (2020). Ecology Guidelines for Electricity Transmission Projects

EPA. 2022. Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Draft, August 2017. Environmental Protection Agency.

Envirico (2020). Level 2 Botany Survey Leixlip, Co Kildare.

Enviroguide Consulting (2023). Appropriate Assessment Screening Report: Glenveagh Homes Large Scale Residential Development

Environmental Impact Services (2016). Natura Impact Statement: Revised Design and Configuration of Previously Permitted Manufacturing Facility, Support Buildings and Site Infrastructure

Environmental Resources Management Ltd (2020a). Appropriate Assessment Screening: Liffey Business Campus – Building NU-02, Leixlip, County Kildare.

Environmental Resources Management Ltd (2020b). Ecological Impact Assessment: Liffey Business Campus – Building NU-02, Leixlip, County Kildare.

Fitzpatrick, U., Murray, T.E., Byrne, A., Paxton, R.J. & Brown, M.J.F. 2006. The Regional Red List of Irish Bees. Queens University Belfast, Northern Ireland.

Fossitt J.A. 2000. A Guide to Habitats in Ireland. Heritage Council, Kilkenny.

Gilbert G., Stanbury, A. and Lewis, L., 2021. "Birds of Conservation Concern in Ireland 2020 – 2026". Irish Birds 9: 523—544

Grant, G., Gunnell, K. & Williams C. (2012) Landscape and urban design for bats and biodiversity Bat Conservation Trust, London.

IDOM, ROD (2022). Natura Impact Statement: DART+ West Railway Order.

ILP (2018). Guidance Note 08/18 Bats and Artificial Lighting in the UK. Bats and the Built Environment Series Publication with BCT.

Irish Water (2021). Annual Environmental Report 2020. Agglomeration Name: Lower Liffey Valley Regional Sewerage Scheme. Licence Register No. D0004.

JNCC (2004). Common Standards Monitoring Guidance for Terrestrial Mammals, Version August 2004, ISSN 1743-8160.

Kelleher, C. & Marnell, F. (2006) Bat Mitigation Guidelines for Ireland. Irish Wildlife Manuals, No. 25. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Kelly, J., O' Flynn, C., and Maguire, C. 2013. Risk analysis and prioritisation for invasive and non-native species in Ireland and Northern Ireland. A report prepared for the Northern Ireland Environment Agency and National Parks and Wildlife Service as part of Invasive Species Ireland.

King,J.L., Marnell, F., Kingston, N., Rosell, R., Boylan, P., Caffrey,J.M., FitzPatrick,Ú., Gargan,P.G., Kelly,F.L., O'Grady,M.F., Poole,R., Roche,W.K. & Cassidy, D. 2011. Ireland Red List No. 5: Amphibians, Reptiles & Freshwater Fish. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Lundy, M.G., Aughney, T., Montgomery, W.I. & Roche, N. 2011. Landscape Conservation for Irish Bats & Species-Specific Roosting Characteristics. Bat Conservation Ireland.

Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

Marnell F, Presetnik P (2010) Protection of overground roosts for bats (particularly roosts in buildings of cultural heritage importance). EUROBATS Publication Series No. 4. UNEP / EUROBATS Secretariat, Bonn, Germany

Nairn, R. & Fossitt, J. 2004. The Ecological Impacts of Roads, and an Approach to their Assessment for National Roads Schemes. In: J. Davenport & J.L. Davenport (eds) The Effects of Human Transport on Ecosystems: Cars and Planes, Boats and Trains, 98-114. Royal Irish Academy, Dublin.

Nelson, B., Ronayne, C. & Thompson, R. (2011). Ireland Red List No.6: Damselflies & Dragonflies (Odonata). National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland.

Pearce, Huma & Hawkins (Walters), Charlotte. (2012). Do Green Roofs Provide Habitat for Bats in Urban Areas?. Acta Chiropterologica. 14. 469-478. 10.3161/150811012X661774.

Regan, E.C., Nelson, B., Aldwell, B., Bertrand, C., Bond, K., Harding, J., Nash, D., Nixon, D., & Wilson, C.J. (2010) Ireland Red List No. 4 – Butterflies. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Ireland.

Roche, N., Aughney, T., Marnell, F. and Lundy M. 2014. Irish Bats in the 21st Century. Bat Conservation Ireland, Cavan.

Ryan Hanley (2021). Appropriate Assessment Screening Report: Leixlip WWTP Upgrades.

Scott Cawley (2018). Appropriate Assessment Screening Report: Proposed Solar Farm Development, Celbridge, Co. Kildare

Scott Cawley (2019). Natural Impact Statement: Provision of Information for Appropriate Assessment for Revised and Extended Manufacturing Facility at Intel Collinstown Industrial Park, Leixlip, Co. Kildare.

Smith G.F., O'Donoghue P., O'Hora K. & Delaney E. 2011. Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council.

Sutherland W.J (Ed.) (1996). Ecological Census Techniques, a Handbook. Cambridge, UK.

Wyse Jackson M., FitzPatrick Ú., Cole E., Jebb M., McFerran D., Sheehy Skeffington M. & Wright M. 2016. Ireland Red List No. 10: Vascular Plants. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Dublin, Ireland.

7.0 LAND, SOILS, GEOLOGY AND HYDROGEOLOGY

7.1 INTRODUCTION

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared by AWN Consulting Ltd. which assesses and evaluates the likely significant impacts of the project on the land, soil, geological and hydrogeological aspects of the site and surrounding area associated with the principal and facilitation works. These are as follows:

A. The 'principal' works subject to the development consent being sought from Kildare County Council, i.e. the proposed development; and
B. 'Facilitation works' required to support the development which do not form part of the development consent being sought from Kildare County Council. The facilitation works include a mix of works that will be required to be undertaken for or on behalf of statutory undertakers such as Gas Networks Ireland and EirGrid.

The principal works include the proposed expansion of the existing innovation campus and all those works included within the redline boundary and described on the statutory notices accompanying the application. The facilitation works are those known works that are required to facilitate the proposed development over the life of the permission being sought.

In assessing likely impacts, account is taken of both the importance of the existing land, soils, geological and hydrogeological attributes and the predicted scale and duration of the likely impacts.

7.1.1 PROJECT PERSONNEL

Teri Hayes (BSc MSc PGeol EurGeol) is a Director and Senior Hydrogeologist with AWN Consulting with over 25 years of experience in water resource management, environmental assessment and environmental licensing. Teri is a former President of The International Association of Hydrogeologists (IAH, Irish Group) and is a professional member of the Institute of Geologists of Ireland (IGI) and European Federation of Geologists (EurGeol). She has qualified as a competent person for contaminated land assessment as required by the IGI and EPA. Her project experience includes contributions to a wide range of complex Environmental Impact Statements, planning applications and environmental reports for Industry Infrastructure and residential developments. Teri's specialist area of expertise is water resource management, eco-hydrogeology, hydrological assessment and environmental impact assessment. Teri will be assisted by the water and environment section at AWN which includes a team of experienced hydrogeologists and environmental scientists.

Conor McGrath is a Senior Environmental Consultant at AWN, with over 12 years' experience working in the geology and environmental science fields. Conor is a Chartered Environmentalist (CEnv) and is a professional member of the Institute of Geologists of Ireland (PGeo) and European Federation of Geologists (EurGeol). Conor has experience with a wide range of projects including site investigations, contaminated land, project management, environmental compliance and licencing, environmental remediation programmes and environmental impact assessments. Conor has extensive experience in managing development projects, stakeholder engagement, leading teams, change management, operational transformation, corporate compliance, and governance programmes.

Alan Wilson is an Environmental Consultant with AWN Consulting. Alan holds a BSc Honours in Environmental Management in Agriculture/Environmental and Geographical Sciences, working on projects involving EIA Reports, Flood Risk Assessments, Soil and Water Baseline Reports, Environmental Site Investigations and carrying out soil and groundwater monitoring on contaminated lands and a range of other developments. Alan has over 2 years' experience as an Environmental Consultant including roles in Ecology and Forestry related work.

7.2 PROJECT DESCRIPTION (PRINCIPAL WORKS)

The Davy Platform ICAV, on behalf of the Liffey Sub-Fund, intend to apply for permission for development of an integrated campus Masterplan proposal including 2 no. Deep Tech Buildings, 4 no. Data Centres, an Energy Centre, new campus entrance incl. signalised intersection, a new public road, internal roads & pathways, a new pedestrian/cycle overpass of the M4 Motorway and supporting infrastructure with an overall area of c. 72.2 ha inclusive of 1.83 ha of lands within the ownership of KCC. The proposal will also include the demolition of existing buildings no's 7, 8 & 9.

The site will include the provision for 4 No. Data Centres and a total of 80no. generators. The fuel for the generators will be stored in individual, double-skinned storage tanks. Each tank has the capacity to store 15.5 m*3* of diesel; therefore, a total of 1,240 m3 across all Data Centres (or 1066 tonnes at a density of 0.86 tonnes / m*3*). The energy centre will have its own HVO bulk storage of c.3440 tonnes.

There will be an increase in overall hardstand as a result of the proposed development of c. 171,641.88 m2. The existing site has a total hardstanding of c. 86,029.00 m2. The proposed development will have a total hardstanding of c. 257, 670.88 m2.

Attenuation measures include bio retention areas, attenuation ponds, swales, filter drains, permeable paving and hydrocarbon interceptors. Proposed discharge rates for the Proposed Development and the overall landholding are addressed in CSEA's *Engineering Services Report Drainage and Water Services* submitted with the planning application.

7.2.1 Facilitation Works

The facilitation works required to support the development are works which do not form part of the development consent being sought from Kildare County Council. The facilitation works include a mix of works that will be required to be undertaken for or on behalf of statutory undertakers such as Gas Networks Ireland and EirGrid. The facilitation works will be subject to future consents as required by GNI and EirGrid but are included the project for the purpose of the EIAR.

<u>GNI Gas Upgrades</u>

The GNI upgrades will be delivered through a local upgrade of the gas network over a length of approximately 1.5km through predominantly residential areas. The route of the upgrades will be along Ryevale Lawns along Station Road, Old Hill and Celbridge Road for a distance of approximately 1.5km up to the entrance of Barnhall Meadows. The pipe will run under the existing road pavement. At the entrance to Barnhall Meadows, the pipe will run underground

through the Barnhall Meadows lands (adjacent to the existing haul road) and will then cross the M4 Motorway through Horizontal Directional Drilling and enter the Kildare Innovation Campus then connecting to the proposed Gas Skid.

EirGrid Uprating

Upon completion of Phase 1 of the KIC Masterplan, including the development of the proposed replacement 110kV Substation, uprating of existing overhead lines from the replacement 110kV Rinawade substation to Derryiron/Maynooth and Dunfirth/Kinnegad will be required to facilitate commencement of Phase 3 of the KIC Masterplan. The uprating will be carried out to existing lines along established wayleaves primarily traversing agricultural lands.

A detailed description of the project is outlined in Chapter 2 of this EIAR.

7.3 METHODOLOGY

The following relevant policy, legislation and guidance has informed the preparation of this chapter:

- *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);*
- *Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessments (Department of Housing, Planning and Local Government – August, 2018);*
- *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022);*
- *Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment (European Union, 2017);*

The preparation of this chapter has also been informed by desktop studies of relevant policy documents and data sources including:

- Geological Survey of Ireland (GSI) - on-line mapping, Geo-hazard Database, Geological Heritage Sites & Sites of Special Scientific Interest, Bedrock Memoirs and 1: 100,000 mapping;
- Teagasc soil and subsoil database;
- Ordnance Survey Ireland - aerial photographs and historical mapping;
- Environmental Protection Agency (EPA) – website mapping and database information;
- National Parks and Wildlife Services (NPWS) – Protected Site Register;

7.3.1 Baseline Scenario/Receiving Environment Analysis Methodology

The EPA Guidelines on the Preparation of an EIAR (EPA, May 2022) state that:

> *"It is important to demonstrate that correct methodologies and experts have been used. It is also important that the methodology used in establishing the baseline scenario is documented to permit replicable future monitoring so that the later results*

can be properly compared (where required). Standard recognised methods should be applied where available and appropriate."

This Chapter evaluates the effects, if any, which the project will have on Land, Soils, Geology and Hydrogeology as defined in the Environmental Protection Agency (EPA) '*Guidelines on the Information to be contained in Environmental Impact Assessment Reports'* (EPA, 2022) as well as in line with Article 94 and Schedule 6 of the Planning and Development Regulations 2001 (as amended) and Article 5 and Annex IV of the EIA Directive (2011/92/EU, as amended).

The Draft EPA document entitled '*Advice Notes for Preparing Environmental Impact Statements'* (EPA, 2015) is also followed in this geological and hydrogeological assessment and classification of environmental effects. Due consideration is also given to the guidelines provided by the Institute of Geologists of Ireland (IGI) in the document entitled '*Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements'* (IGI 2013).

The document entitled '*Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes*' by the Transport Infrastructure Ireland (TII) formerly National Roads Authority (NRA) (TII, 2009) is referenced where the methodology for assessment of impact is appropriate.

The baseline/future receiving environment analysis for this Chapter has been undertaken in accordance with the EPA Guidelines on the Preparation of an EIAR (EPA, May 2022) and all other documents outlined above.

7.3.2 Impact Assessment Methodology

The rating of potential environmental effects on the land, soil, geological and hydrogeological environment is based on the standard EIAR impact predictions table included in Chapter 1 which takes account of the quality, significance, duration and type of effect characteristic identified.

The duration of each effect is considered to be either momentary, brief, temporary, short-term, medium term, long-term, or permanent. Momentary effects are considered to be those that last from seconds to minutes. Brief effects are those that last less than a day. Temporary effects are considered to be those which are construction related and last less than one year. Short term effects are seen as effects lasting one to seven years; medium-term effects lasting seven to fifteen years; long-term effects lasting fifteen to sixty years; and permanent effects lasting over sixty years.

The TII (2009) criteria for rating the magnitude and significance of impacts on the geological related attributes and the importance of hydrogeological attributes at the site during the EIA stage.

The principal attributes (and effects) to be assessed include the following:

- Geological heritage sites within the vicinity of/ within the perimeter of the proposed development site;
- Landfills, industrial sites in the vicinity of the site and the potential risk of encountering contaminated ground;

- The quality, drainage characteristics and range of agricultural use(s) of subsoil around the site;
- Quarries or mines in the vicinity and the potential implications (if any) for existing activities and extractable reserves;
- The extent of topsoil and subsoil cover and the potential use of this material on site as well as any requirement to remove it off-site as waste for disposal (D) or recovery (R) options;
- High-yielding water supply wells/ springs in the vicinity of/ within the site boundary to within a 2km radius and the potential for increased risk presented by the proposed development;
- Classification (regionally important, locally important etc.) and extent of aquifers underlying the site boundary area;
- Increased risks presented to the groundwater bodies by the proposed development associated with aspects such as, for example, the removal of subsoil cover, removal of aquifer (in whole or part thereof), spatial drawdown in water levels, alteration in established flow regimes, and changes in local/ regional groundwater quality;
- Natural hydrogeological/ karst features in the area and potential for increased risk presented by the activities at the site; and
- Groundwater-fed ecosystems and the increased risk presented by operations both spatially and temporally.

The analysis of the predicted impacts of the project on land, soil, geology and hydrogeology during 'do-nothing' scenario and construction and operation are presented in this Chapter. The assessment considered geological features identified within the project site and the surrounding vicinity in accordance with the methodology outlined above and below, to determine the significance of the impacts. Where likely significant impacts are highlighted, mitigation and monitoring are proposed, and any residual impacts are assessed.

The impact assessment for this Chapter has been undertaken in accordance with the *EPA Guidelines on the Preparation of an EIAR* (EPA, May 2022) and all other documents outlined above.

7.3.3 Scoping and Identification Methods

The EPA Guidelines, 2022 state that:

> *"each* [environmental] *factor is typically explored by examining a series of headings and/or topics relevant to that factor"* and *"The relevant topics for any given EIAR should be established during scoping".*

The methods employed for scoping and identification of the relevant environmental topics for this Chapter have been:

1. Expert Opinion stemming from the baseline/future receiving environment analysis
2. Review of Strategic Environmental Assessment prepared for the Kildare County Development Plan 2023-2029 (including a review of the Development Plan itself).
3. Geospatial Analysis (cumulative impacts only – used to identify planning permissions/applications within a 5 km radius)

4. Other relevant documentation consulted as part of this assessment included the following site specific sources:

   - Clifton Scannell Emerson Associates Limited, Consulting Engineers – `Construction Environmental Management Plan Kildare Innovation Campus. Project No. 21_048. February 2023;
   - Clifton Scannell Emerson Associates Limited, Consulting Engineers – Engineering Services Report Drainage and Water Services. Project No. 21-_048. February 2023.
   - Clifton Scannell Emerson Associates Limited, Consulting Engineers – Site Specific Flood Risk Assessment – Kildare Innovation Campus. February 2023;
   - LBC Preliminary Site Assessment Report. Project No. 0523254. September 2020
   - RSK Ireland Limited (RSK) Preliminary Environmental Site Assessment Report. Project No. 602128-R01(00). March 2018; and
   - IGSL Factual Ground Investigation Report. Liffey Park Technology Campus. February, 2020;
   - Assimilative Capacity Study – Liffey Science and Technology Business Park. ARUP, May 2023;
   - Various design site plans and drawings; and
   - Consultation with site engineers/ planners/ architects.
   - Various design site plans and drawings.

7.3.4 Assessment and Evaluation Methods

Assessment and evaluation methods quantify and predict the magnitude and significance of impacts.

The methods employed for assessment and evaluation of the environmental topics for this Chapter have been:

1. The rating of potential environmental effects on the hydrogeological environment is based on the standard EIAR impact predictions table included in Chapter 1 which takes account of the quality, significance, duration and type of effect characteristic identified (in accordance with impact assessment criteria provided in the EPA Guidelines (2022) publication) set out in Chapter 1 Table 1.2; and
2. The TII criteria for rating the magnitude and significance of impacts and the importance of hydrogeological attributes at the site during the EIA stage are also relevant in assessing the impact and are presented in Tables 1-3 in Appendix 7.1.

7.3.5 Forecasting Issues or Difficulties Encountered

There were no difficulties encountered in compiling this chapter of the EIAR.

7.4 CURRENT STATE OF THE RECEIVING ENVIRONMENT

The EIA Directive requires the following to be described relating to the baseline scenario:

"A description of the relevant aspects of the current state of the environment (baseline scenario)".

The receiving environment is discussed in terms of land geology, soils, hydrogeology, and site history including potential for existing and historical contamination.

7.4.1 Site Setting

Principal Works

The proposed development site of c 72.2 ha is located on the Celbridge Road, Leixlip, County Kildare located approximately 4km south of Leixlip town and approximately 21km west of Dublin city centre. The site is centred at Irish Grid reference N 99080 34746 at an altitude of approximately 51m.

The site comprises of 10 buildings with approximately 1,600 car spaces and associated green spaces. The site operated as an inkjet cartridge manufacturing plant and construction of the site was completed in 1996. The site now operates as an Innovation Campus with a mix of science and technology related tenants. The site includes a two-storey office building, two manufacturing facilities, warehousing and lab spaces, a main canteen building and two energy centre buildings which house heating boilers and associated ancillary equipment. The site is accessible by via the Celbridge Road and a private road located near the M4 motorway slipway (Junction 6).

The site is bordered to the north by the M4 motorway, to the south Barnhall Rugby and football club with residential dwellings and the river Liffey beyond, to the west agricultural land with Celbridge town beyond and to the east is agricultural land with Weston Airport beyond.

Facilitation Works

The facilitation works include a mix of works that will be required to be undertaken for or on behalf of statutory undertakers such as Gas Networks Ireland and EirGrid.

GNI Upgrades

The GNI upgrades will be delivered through a local upgrade of the gas network over a length of approximately 1.5km through predominantly residential areas. The route of the upgrades will be along Ryevale Lawns along Station Road, Old Hill and Celbridge Road for a distance of approximately 1.5km up to the entrance of Barnhall Meadows running underground through the Barnhall Meadows lands (adjacent to the existing haul road) before crossing the M4 Motorway through Horizontal Directional Drilling and enter the Kildare Innovation Campus then connecting to the proposed Gas Skid.

EirGrid Uprating

Upon completion of Phase 1 of the KIC Masterplan, including the development of the proposed replacement 110kV Substation, uprating of existing overhead lines from the replacement 110kV Rinawade substation to Derryiron/Maynooth and Dunfirth/Kinnegad will be required to facilitate commencement of Phase 3 of the KIC Masterplan. The uprating will be carried out to existing lines along established wayleaves primarily traversing agricultural lands.

Due to the nature of the proposed EirGrid works being minimal and comprising only minor line and structural replacement, they have been scoped out of this assessment as the interaction between land, soils, geology and hydrogeology with the proposed works is negligible.

The surrounding environment for both the principal and facilitation works can be described as a mix of agricultural and residential. The site location map for the proposed development is presented in presented in Figure 7.1 below.

A detailed description of the project is outlined in Chapter 2 of this EIAR.

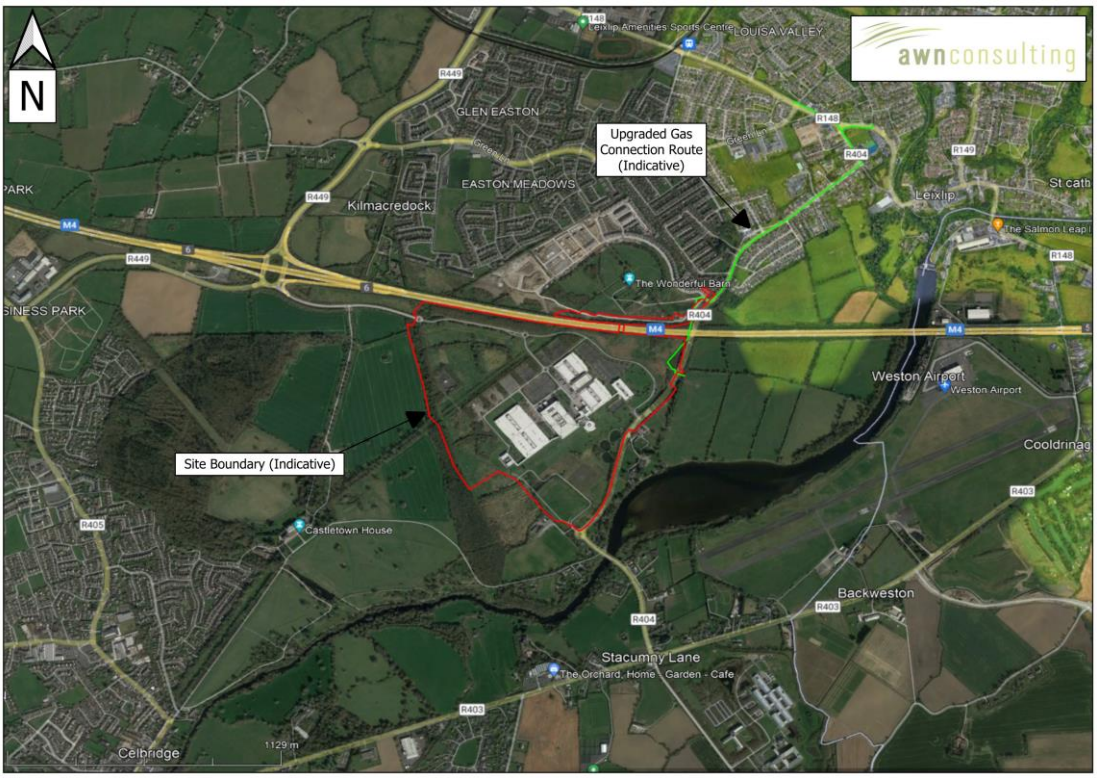


Figure 7.1 *Site Location and Surrounding Land Use (AWN, 2022)*

(*Note: The proposed EirGrid Uprating has been excluded from the drawing set of this EIAR due to the scale of the uprating route being too large to display in drawing. Due to the nature of the proposed works being minimal, they have been excluded from the scope of this assessment*).

7.4.2 Topography and Setting

The site is generally flat and has an elevation of 51.0 m above Ordnance Datum (mAOD). The existing Liffey River run adjacent to the site in a west to north east direction. There is an existing Reservoir east of the site location which forms part of the Liffey River. The site discharges its surface water runoff into the Leixlip Reservoir following confirmation of water quality through electronic monitoring mechanisms inclusive of shut off valves, upstream of the existing Retention Ponds near the existing site entrance off the Celbridge Road.

7.4.3 Areas of Geological Interest and Historical Land Use

The GSI (2022) on-line mapping was reviewed to identify sites of geological heritage for the proposed development and surrounding area. Details of the Site history and previous land use are included in Chapter 15 -Archaeology & Cultural Heritage.

A review of the site history was undertaken by assessing the available historical maps and reports. The earliest available map dates from the period 1837-1842 and shows the principal works site as being undeveloped agricultural land. On the site is a small barn/farm labelled “Barn Hall”. The facilitation works site also show for this time period the majority of the surrounding land is in agricultural use along the road now known as “Celbridge Road”. Along the now “Old Hill” Road the New and Old R.C. Chapel was located which is now the location of “Scoil Chearbhaill”, “Our Lady’s Navity” and the “Parish Centre”.

The next available map dates from the period 1888 - 1913 and shows little change to the site or the surrounding area for both the principal and facilitation works. The map still shows the surrounding area as undeveloped agricultural land with the only notable development being the construction of a number of residential dwellings to the east and south of the principal works site along the River Liffey. Some Residential developments are also noted to the east of the facilitation works also.

1995 aerial imagery show early signs of construction on the principal works site and large amounts of residential developments surrounding both the principal and facilitation works sites. The 2000 aerial imagery shows the principal works site in its current configuration. Anecdotal evidence indicates that the site operated as an abattoir and meat packaging facility prior to the development of the HP facility in the mid-1990’s. The most recent aerial imagery available to date shows no great changes to surrounding land use in relation to the principal and facilitation works from the period 2000.

During redevelopment work a significant volume of canned meat and animal carcasses were encountered and removed. No significantly contaminating historical site uses have been identified.

The historic mapping below from c. 1837-1842 indicates the historic use of the principal and facilitation works sites being predominately agricultural use with some small unidentified residential buildings located to the west of the facilitation works – See Figure 7.2 below.

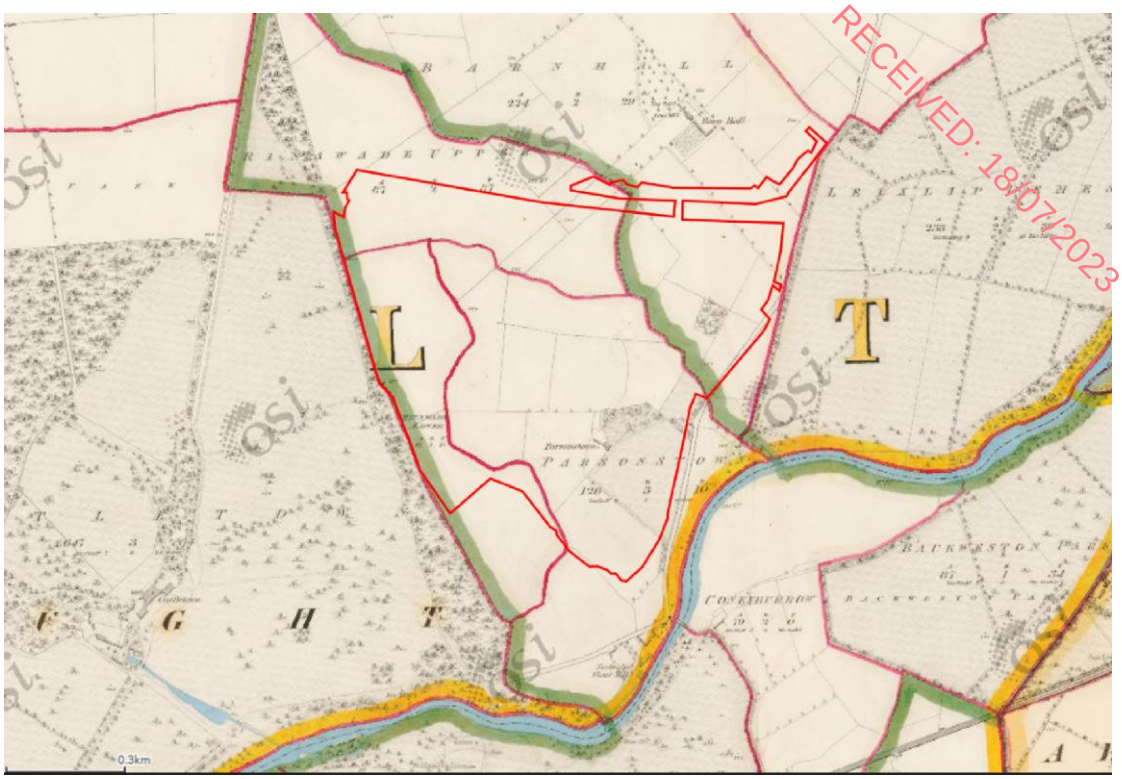


Figure 7.2 *Historic Map 6 inch Colour (c. 1837-1842) (source www.osi.ie): showing the Indicative Site Outline highlighted in red*

7.4.4 Soils

The GSI/Teagasc soil mapping indicates that the principal soil type underlying the principal works area of the proposed development to be Mineral Poorly Drained (Mainly Basic) BminPD with the GNI Transmission Line Alignment underlain mostly by Made Ground and Deep Well Drained Mineral Soil (BminDW)– refer to Figure 7.3 below.

According to the site investigation undertaken by IGSL between December 2019 and February 2020 reported the ground conditions to be consistent with made ground deposits described as sandy gravelly Clay with some occasional fragments of tarmacadam and concrete.

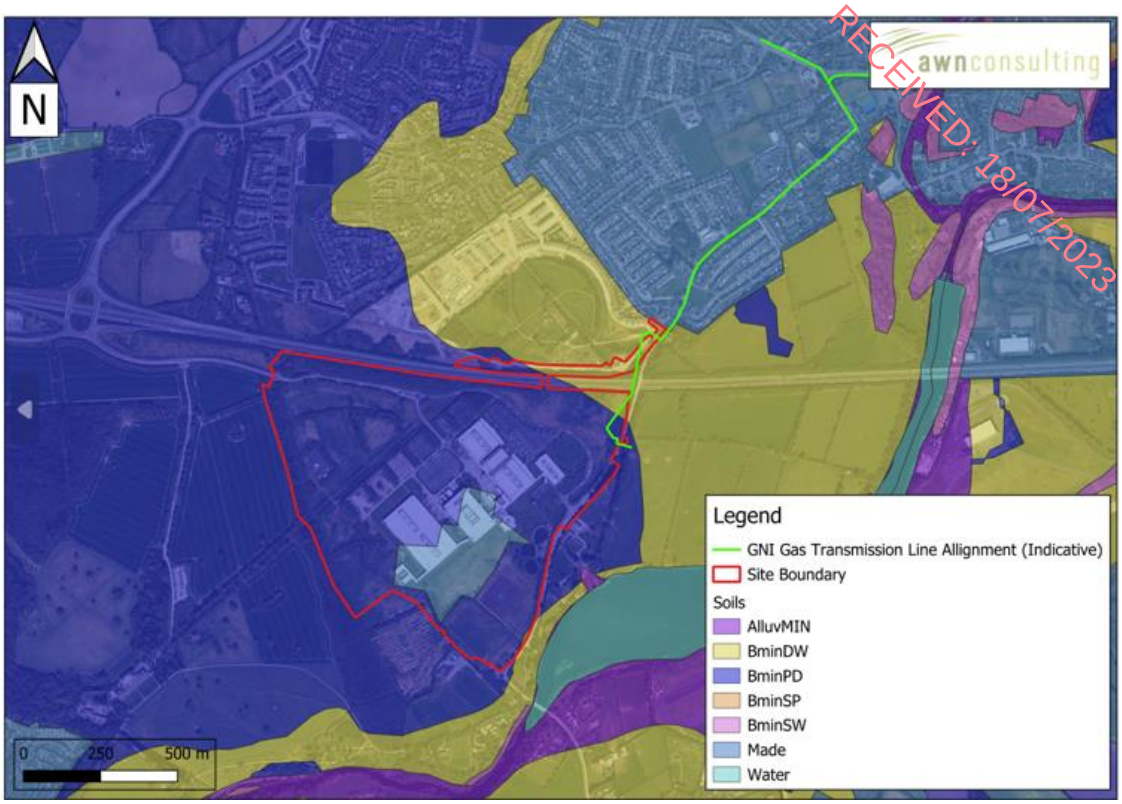


Figure 7.3 *Soils Map (Source: Teagasc, 2022)*

7.4.5 Subsoils

The Quaternary geological period extends from about 1.5 million years ago to the present day and can be sub-divided into the Pleistocene Epoch, which covers the Ice Age period, and which extended up to 10,000 years ago and the Holocene Epoch, which extends from that time to the present day.

The GSI/ Teagasc mapping database of the subsoils in the area of the principal works site indicates two principal soil types, as shown in Figure 7.4 below. The quaternary subsoil type present across the principal site is Carboniferous limestone till (TLs) “Till derived from limestone”. This till is made up of glacial clay which are less permeable than alluvium subsoils. The GNI Transmission Line Alignment “facilitation works” is underlain almost entirely by Made Ground with the southern portion underlain by “Till derived from limestone” .

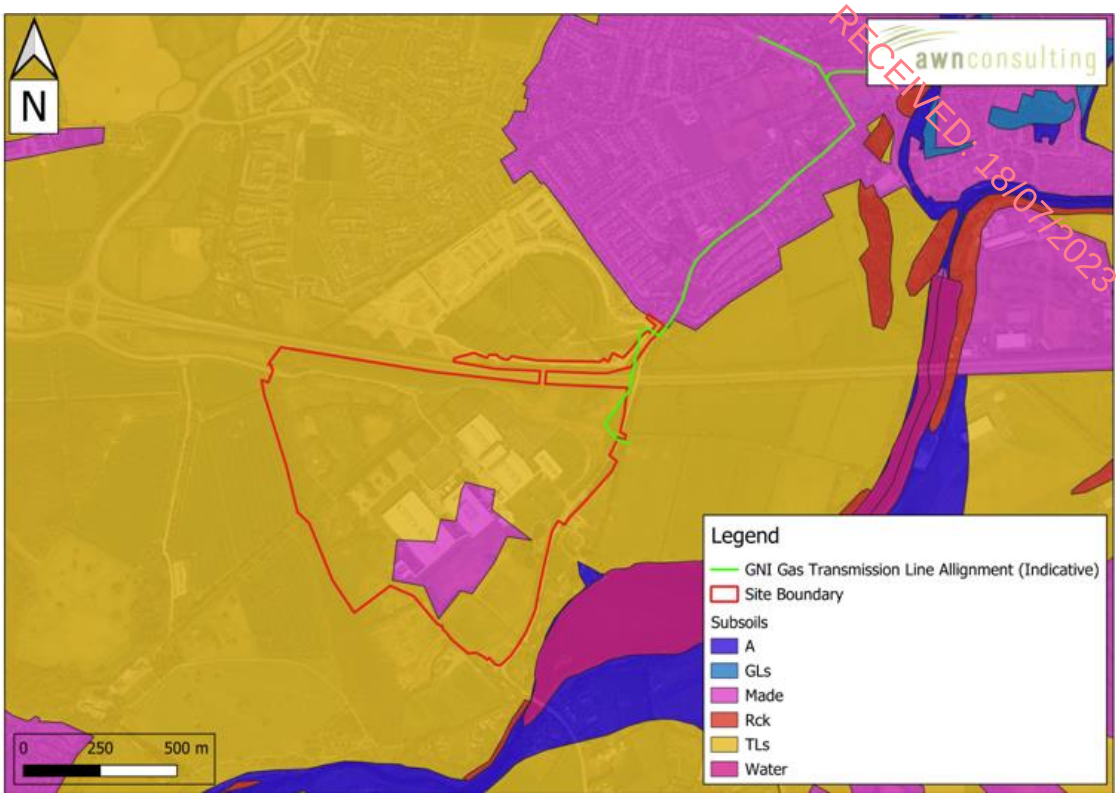


Figure 7.4 *Subsoils Map (Source: Teagasc, 2022)*

7.4.6 Site Investigations

IGSL Ltd. carried out/undertook an environmental site investigation at the proposed development site between October and December 2019. The scope of works included trial pitting, subsoil sampling, interpretation of chemical data and reporting. The sequence of subsoils deposits recorded during the site investigations are shown in Table 7.1. Site investigation locations are shown in Appendix 7.1.

Site investigation works entailed Environmental Laboratory testing and waste classification. Refer to Figure 7.5 below for locations of these investigation points.

The programme of exploratory works included the following:

- 7 no. cable percussive boreholes
- 4. No rotary core holes
- 15 no. mechanically excavated trial pits
- 8 no. dynamic cone penetrometer (DCP) tests
- Groundwater monitoring at borehole locations
- A programme of geotechnical and chemical laboratory testing

Samples recovered from trial pits or trenches meet the requirements of IS ISO 22475-1. It is highlighted that unforeseen circumstances such as variations in geological strata may lead to lower quality sample classes being obtained.

Refer to appendix 7.1 for Factual Ground Investigation Report 2020.

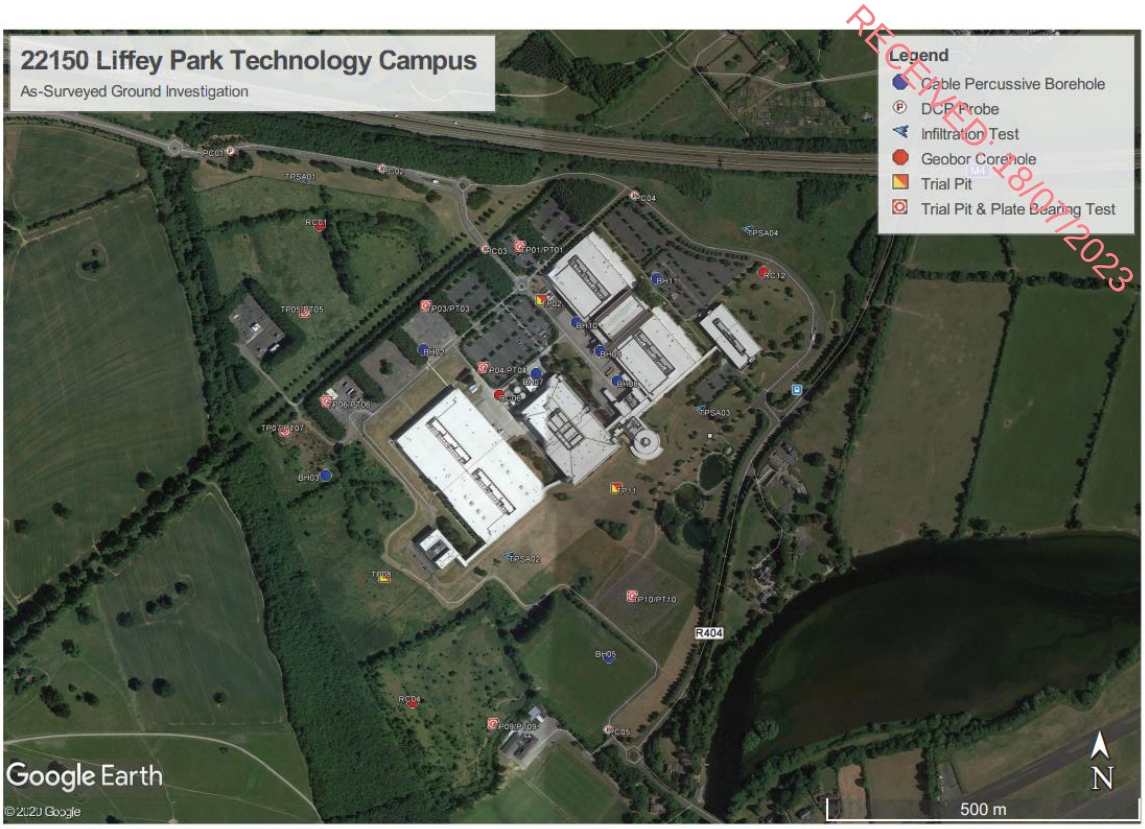


Figure 7.5 *Site Investigation Points (Source: IGSL, 2019)*

Name	Depths/ Notes
Topsoil	0.0 m - 0.2 m below ground level (mbgl)
Made Ground	Made Ground deposits were generally encountered from surface or beneath the Topsoil and were present to a variable depth of between 0.4 m and 1.3 mbgl. These deposits were described generally as fill characterized by brown clayey fine to coarse rounded Gravel with abundant cobbles or alternatively, slightly sandy gravelly CLAY with occasional redbrick, concrete and glass fragments.
Cohesive Deposits	Cohesive deposits were encountered beneath the Made Ground or Topsoil and were described typically as Firm grey slightly sandy slightly gravelly CLAY. Sand is fine to coarse. Gravel is subangular to subrounded.
Granular Deposits	The granular deposits were encountered within the cohesive deposits and were typically described as Very strong to medium strong, thickly to thinly bedded (to thinly laminated where fissile mudstone/shale), grey/dark grey/black, fine-grained limestone.

Table 7.1 ***Strata Noted from Site Investigations (IGSL, 2019)***

7.4.7 Bedrock Geology

The Geological Survey of Ireland (GSI) reports that the solid geology underlying both the principal and facilitation works site is Carboniferous Limestone derived from the Lucan formation which comprises dark-grey to black, fine-grained, occasionally cherty, micritic limestones that weather paler, usually to pale grey. There are rare dark coarser grained calcarenitic limestones, sometimes graded, and interbedded dark-grey calcar - refer to 7.6 below.

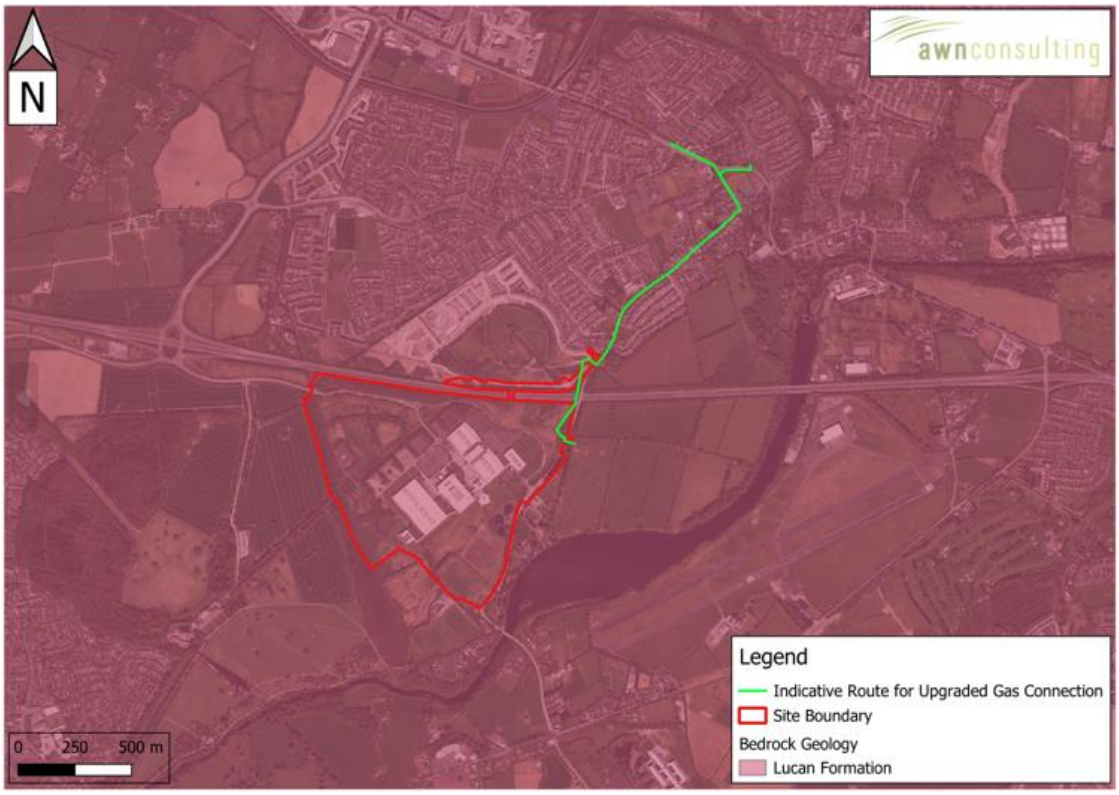


Figure 7.6 *Bedrock Geology Map (source: GSI, 2022)*

7.5 Regional Hydrogeology

The GSI has devised a system for classifying the bedrock aquifers in Ireland. The aquifer classification for bedrock depends on a number of parameters including, the area extent of the aquifer (km^2), well yield (m^3/d), specific capacity ($m^3/d/m$) and groundwater transmissivity (mm^3/d). There are three main classifications: regionally important, locally important and poor aquifers. Where an aquifer has been classified as regionally important, it is further subdivided according to the main groundwater flow regime within it. This sub-division includes regionally important fissured aquifers (Rf) and regionally important karstified aquifers (Rk). Locally important aquifers are sub-divided into those that are generally moderately productive (Lm) and those that are generally moderately productive only in local zones (Ll). Similarly, poor aquifers are classed as either generally unproductive except for local zones (Pl) or generally unproductive (Pu).

7.5.1 Aquifer Classification

From analysis of GSI National data the bedrock aquifer underlying the study site is classified as 'Locally Important' which is characterised as moderately productive only in Local Zones - refer to Figure 7.7 below.

Figure 7.7 *Aquifer Classification Map (source: GSI, 2022)*

7.5.2 Aquifer Vulnerability

Aquifer vulnerability is a term used to represent the intrinsic geological and hydrogeological characteristics that determine the ease with which groundwater may be contaminated generally by human activities. Due to the nature of the flow of groundwater through bedrock in Ireland, which is almost completely through fissures, the main feature that protects groundwater from contamination, and therefore the most important feature in protection of groundwater, is the subsoil (which can consist solely of peat, sand, gravel, glacial till, clays or silts – or mixtures thereof).

As can be seen from Table 7.2 below, moderate and high vulnerability denotes a depth of bedrock of 5 – 10 m and 3 – 5 m, respectively. The results obtained from the ground investigations report carried out by IGSL in October to December 2019 indicate a vulnerability rating of extreme/high, as bedrock was encountered at depths from 0.4 – 3.2mbgl across the site. It should be noted that bedrock was not encountered in the majority of the excavation holes in areas 3, 4 and 5 (north-east, north-west and western portion of site) which would indicate a vulnerability rating of 'moderate', which is consistent with the GSI classification of the entire central and southern portions of the site.

Vulnerability Rating	Hydrogeological Condition				
	Subsoil Permeability (type) and Thickness[5]			Unsaturated Zone	Karst Features
	High Permeability (sand/gravel)	Moderate Permeability (e.g. sandy subsoil)	Low Permeability (e.g. clayey subsoil, clay, peat)	(Sand/ gravel aquifers only)	(30 m radius)
Extreme (E)	0 - 3 m	0 - 3 m	0 - 3 m	0 - 3 m	-
High (H)	> 3 m	3 - 10 m	3 - 5 m	> 3 m	n/a
Moderate (M)	n/a	> 10 m	5 - 10 m	n/a	n/a
Low (L)	n/a	n/a	> 10 m	n/a	n/a

Table 7.2 *Groundwater Vulnerability Mapping Guidelines (Source: GSI, 2022)*

The GSI currently displays/shows varied aquifer vulnerability across site and its immediate vicinity. The eastern portion of the site and a small portion of the GNI Transmission Line Alignment to the north overlies a 'High' vulnerable aquifer, whilst the majority of the site has a vulnerability classification decreases to 'Moderate'.

This is confirmed by the 2019 investigation undertaken by IGSL. The aquifer vulnerability class in the region of the site is presented below as Figure 7.8.

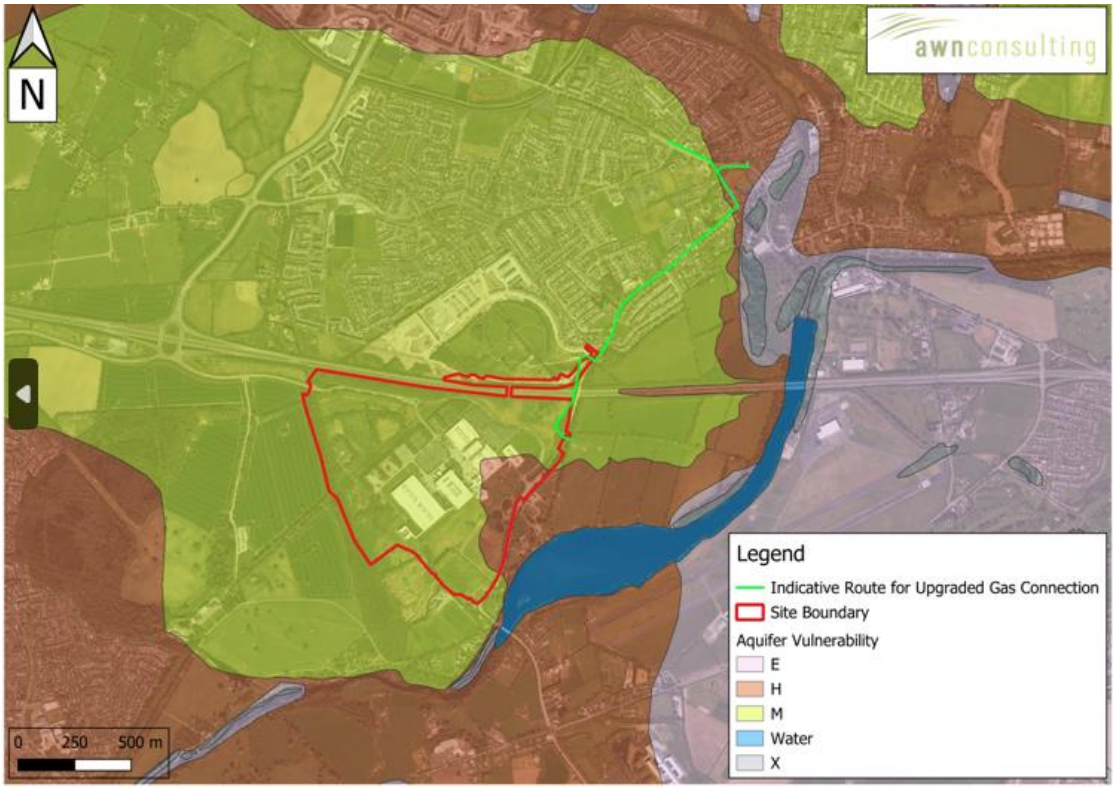


Figure 7.8 *Aquifer Vulnerability Map (source: GSI, 2022)*

7.5.3 Description of the Groundwater Body

The groundwater body in the region of the site (Dublin GWB) is classified as 'Good' per the WFD Risk Score system. The Dublin GWB (Code: IE_EA_G_008) achieved 'Good Status' in the period 2016-2021.

7.5.4 Groundwater Wells and Flow Direction

The topography on-site is generally flat and has an elevation of 51.0 m above Ordnance Datum (mAOD). The topography of the site slopes gently down towards the south east, which is consistent with the surrounding area. It is presumed that the local groundwater flow is to the east towards Leixlip Reservoir.

There is no licencing system for wells in Ireland at present and as such no complete data set. The GSI Well Card Index is a record of wells drilled in Ireland, kept by the Geological Survey of Ireland. It is noted that this record is not comprehensive as licensing of wells is not currently a requirement in ROI.

This current index, however, indicates there are 6 groundwater wells within the vicinity / boundary line of the proposed development site. Table 7.3 presents the GSI well search for the area surrounding the site (note this source does not include all wells).

GSI Name	Depth (m)	Depth to Bedrock (m)	Townland	County	Use	Yield Class	Yield m3/day
2923SWW126	114.3	3	PARSONSTOWN	Kildare	Unknown	Good	305
2923SWW186	21.6		BARNHALL	Kildare	Agri & domestic use	-	-
2923SWW138	8.5	3.5	CASTLETOWN	Kildare	Other	-	-
2923SWW136	15	3.9	CASTLETOWN	Kildare	Other	-	-
2923SWW137	16	3.8	CASTLETOWN	Kildare	Other	-	-
2923SWW131	14.5	3.5	CASTLETOWN	Kildare	Other	-	-

Table 7.3. *Summarises the details of recorded wells present within this search area*

These wells are categorised as Agri and domestic use or other but they are probably inactive. The area is serviced by public mains therefore it is unlikely that any wells are used for potable supply. There are no ground water source protection areas within 10km radius within proposed development site. The nearest is the Dunboyne PWS (public water supply), which is located c. 7.6km to the north. The proposed development site is outside of the zone of contribution of this supply – refer to Figure 7.9 below.

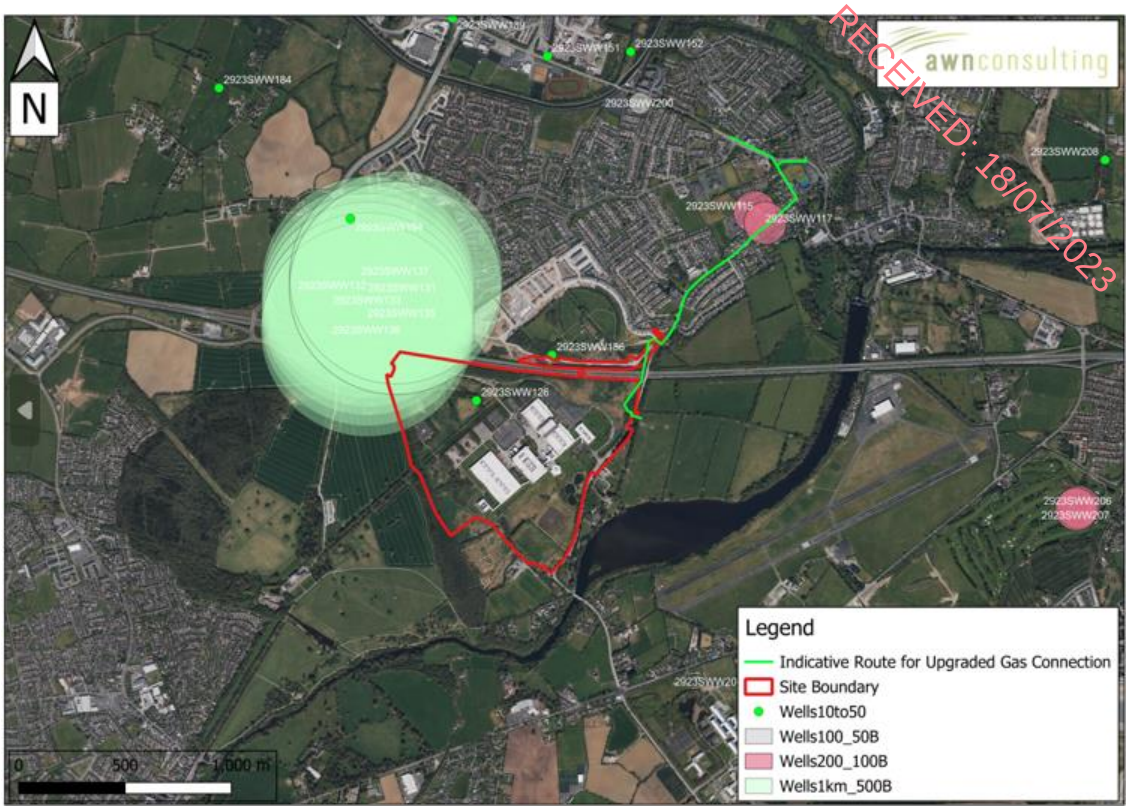


Figure 7.9 *GSI Well Search Map (Source: GSI, 2022)*

7.5.5 Hydrogeological Features

There is no evidence of karstification at the immediate vicinity of the Site according to the GSI Karst and well database.

7.5.6 Groundwater Monitoring Event

A groundwater monitoring event was completed at the site during May 2018 by RSK Ireland Limited to confirm the contamination status of the groundwater underlying the site. A copy of the groundwater monitoring report has been included in Appendix 7.1 of this chapter. Laboratory analysis of groundwater samples reported that concentrations of contaminants of concern did not exceed the adopted Generic Assessment Criteria (GAC) i.e., commercial land use for the site. The groundwater underlying the site is not considered to present a significant risk to human health or the environment.

7.5.7 Soil Quality

There are no legislated threshold values for soils in Ireland. Soil samples were compared to Generic Assessment Criteria (GAC) derived to be protective of human health, water bodies (including groundwater) and also ecology for residential and commercial / industrial end use.

GAC in the UK has been derived using the Contaminated Land Exposure Assessment (CLEA) model to be protective of human health for a number of different land uses. Land Quality Management (LQM) and the CIEH (Chartered Institute of Environmental Health) developed a document in July 2009 detailing their own research and derivation of their own 'LQM GACs'.

A total of 82 substances, including many organic substances had LQM GACs derived, for the standard land uses of residential, commercial / industrial and allotments. This was updated in 2015 following further research and the derived results are now called LQM / CIEH Suitable 4 Use Levels (S4UL). The LQM / CIEH S4ULs are intended for use in assessing the potential risks posed to human health by contaminants in soil and as transparently derived and cautious "trigger values" above which further assessment of the risks or remedial action may be needed. For each contaminant, S4ULs have been derived for six land use scenarios based on assessing exposure pathways in each planning scenario. In this instance, the commercial scenario has been considered. Soil type and soil organic matter (SOM) has an influence on the behaviour of contaminants. S4ULs have been derived for three SOM contents (1%, 2.5% and 6%) to cover the likely range in soils. A prudent approach has been taken by considering the lower 1% SOM content.

The UK values do not have any legal standing within the Republic of Ireland and no statutory guidance for assessing the significance of soil contamination currently exists. However, the values do provide a means of placing the data within context when considering magnitude of risk, and have been used in that capacity in this assessment.

In addition, in line with the requirement of Council Decision 2003/33/EC, during the 2020 site investigations, samples were recovered from the on-site trial pit locations and sent for analysis. In order to assess materials, which may be excavated and removed from site, in terms of waste classification, a selection of samples collected were analysed for a suite of parameters which allowed for the assessment of the soils in terms of total pollutant content for classification of materials as hazardous or non-hazardous referred to as the 'RILTA Suite'.

The parameter list for the RILTA suite includes analysis of the solid samples for arsenic, barium, cadmium, chromium, copper, lead, nickel, mercury, zinc, chloride, fluoride speciated aliphatic and aromatic petroleum hydrocarbons, pH, soluble sulphate, sulphide, phenols, total dissolved solids, moisture content, soil organic matter and an asbestos screen. The total pollutant content analysis also provides analytical data which can be used to assess the quality of the subsoils underlying the Site and allow an assessment of their suitability for a range of proposed uses against generic assessment criteria.

The RILTA Suite also includes those parameters specified in the EU Council Decision Establishing Criteria for the Acceptance of Waste at Landfills (Council Decision 2003/33/EC), referred to as Waste Acceptance Criteria (WAC), which for the solid samples are pH; total organic carbon (TOC); speciated aliphatic and aromatic petroleum hydrocarbons; benzene, toluene, ethylbenzene and xylene (BTEX); phenol; polychlorinated biphenyls (PCB); and polycyclic aromatic hydrocarbons (PAH).

The laboratory analysis did not identify any asbestos containing materials (ACMs) in any of the samples tested.

There was no evidence of waste deposited on-site during Site investigation works (IGSL, 2019). Please see Chapter 12 Waste Management for further discussion on waste categorisation and removal.

7.5.8 Areas of Conservation

According to the NPWS (2022) on-line database there are no special protected areas (SPA's), special areas of conservation (SAC's) within the boundary or immediate vicinity of the subject site. The European listed sites located in closest proximity are as follows:

- The Royal Canal (Site Code: 002103) pNHA - circa. 1.3km north of the site;
- Liffey Valley (Site Code: 000128) pNHA – circa. 1.6km north-east of the site; and
- Roy Water Valley/Carton SAC (Site Code: 001398) – circa. 1.4km north of the site.

The subject site has no hydrological connection with the Rye Water Valley/Carton SAC as the Rye Water is upstream of the River Liffey. However, the site has indirect hydrological connection with Liffey Valley pNHA through the local drainage network and the River Liffey. Potential adverse effects on these European sites from the proposed development are highly unlikely given the distance of removal and inherent mitigation measures in place through standard SuDS measures on site – refer to Figure 7.10 below for the locations of the European sites mentioned above in the context of the site.

The proposed development will have a neutral imperceptible effect on water quality and flow of designated sites within the zone of impact of the development site. A full assessment of the ecology has been undertaken and is included in Chapter 6 of the EIAR.

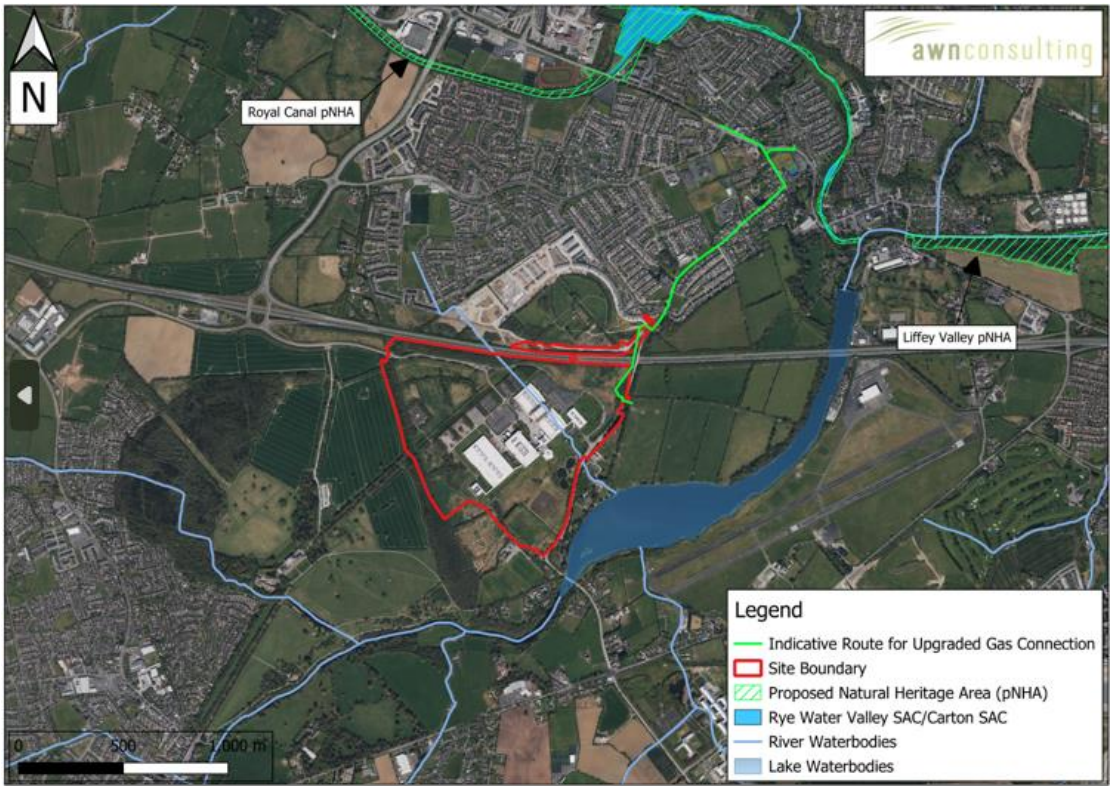


Figure 7.10 *Conservation Areas in context of the proposed development site (EPA, 2022)*

7.5.9 Conceptual Site Model

The cross section and the description below present the Conceptual Site Model (CSM) – refer to Figure 7.11 The CSM was developed in order to identify any likely Source-Pathway-Receptor linkages relating to the site and the proposed development. The site is generally flat with uniform relief at an elevation of 51.0 m above Ordnance Datum (mAOD). The regional gradient westwards towards the River Liffey.

A review of the hydrogeology and geology in the surrounding region indicates that;
The limestone is classified by the GSI as a Locally Important Bedrock Aquifer (LI), which is described as 'moderately productive only in local zones'. The bedrock aquifer is well protected by low permeability clay and characterised by the GSI as a moderate vulnerability area. Groundwater flow within the bedrock unit is eastward in line with the regional gradient. There is no continuous perched groundwater table on-site. The groundwater body in the region of the site (Dublin GWB) is classified under the WFD Risk Score system as currently 'Good'. Previously (2016-2021) the Dublin GWB was given 'Good Status'. Presently, the EPA identify the aquifer beneath the subject site as 'under review'. All of the soil samples collected at the site can be categorised as inert (as per Council Decision annex 2003/33/EC). There was no evidence of contamination during Site investigation works. The proposed Project is outside of any delineated drinking water protection area. There are a number of domestic/ agricultural wells in the surrounding lands. There are no groundwater dependent terrestrial ecosystems which have potential to be impacted by the proposed Project. This is addressed in Chapter 8 (Hydrology) and Chapter 6 (Biodiversity).

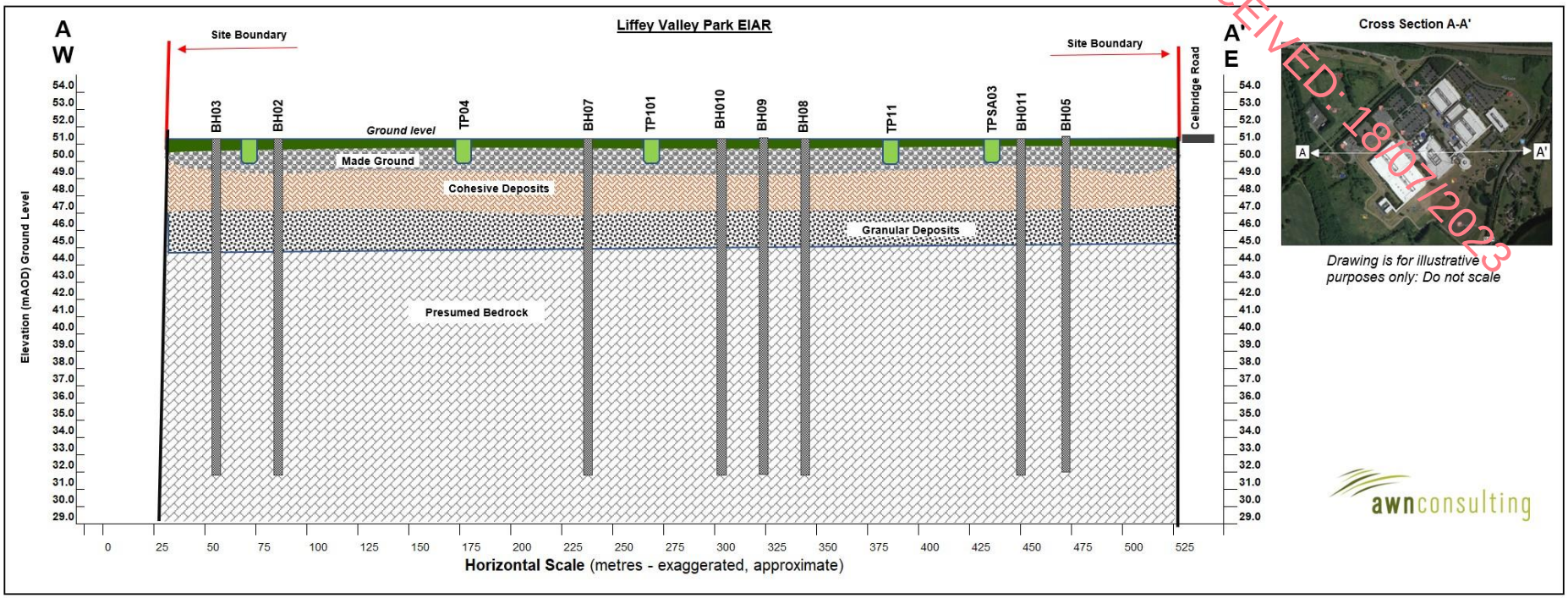


Figure 7.11 *Site Conceptual Model, local cross section of the Site (A-A' northwest to southeast)*

7.5.10 Economic Geology

The EPA Extractive Industry Register and the GSI (2022) mineral database were consulted to determine whether there were / are any mineral sites in the vicinity of the Site. The Belgard Quarry (Keegan Quarries) is an active quarry for extracting sand, pebble, and natural/uncrushed gravel (graded aggregate) and is situated circa 10 km to the southwest of the proposed development.

The mineral locality in closest proximity to the site was identified as an iron deposit in the townland of Laraghcon (Lucan Iron Works), approximately 4.2 km east of the subject site.

7.5.11 Radon

According to the EPA (now incorporating the Radiological Protection Institute of Ireland), the majority of the site is located within a localised zone (encompassing the adjacent Ballina Bog pNHA) where approximately 1 in 20 homes are likely to have high radon levels (above reference level). This would be considered a 'Low' Radon area as per the EPA online mapping tool.

According to the EPA Radon pre May 2022 the subject site location is a Low Radon Area where is it estimated that less than 1.898% of dwellings within the given 10 km grid square will exceed the Reference Level of 200 Bq/m3. This is the lowest of the five radon categories which are assessed by the EPA.

7.5.11 Geohazards

Much of the Earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating the slope failure. Instability is often significantly increased by human activities, e.g. construction, agricultural activities, etc. Mass movements / mass wasting (such as landslides, mud flows, bog bursts and debris flows) are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock; and where the sea constantly erodes the material at the base of a cliff, landslides and falls lead to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. The GSI landslide database was consulted and there are no recorded landslides in the immediate vicinity of the proposed Project. Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the Site.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland, operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events. Records since 1980 show that the nearest seismic activity to the site of the proposed Project was in the Irish Sea c. 30km to the east of the site (1.0 – 2.0 Ml magnitude) and ~55 km to the south in the Wicklow Mountains. There is a very low risk of seismic activity at the site. There are no active volcanoes in Ireland so there is no risk from volcanic activity.

7.5.12 Characteristics of Importance of Geological and Hydrogeological Attributes

Based on the TII (previously NRA) methodology (2009), criteria for rating site importance of geological features, the importance of the bedrock and soil features at this site is rated as *'Low Importance'* due to local geological attribute has a low quality, significance or value on a local scale.

Based on the TII methodology (2009), the importance of the hydrogeological features at this site is rated as '*Medium Importance'* based on the assessment is a Locally Important (LI) bedrock aquifer which is moderately productive.

7.5.13 Likely Future Receiving Environment

The EIA Directive requires the following to be described relating to the future receiving environment (the 'Do Nothing' scenario):

> *"an outline of the likely evolution thereof without implementation of the project as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge".*

It is likely that the land use will change over time even if this development does not go ahead. The associated impact of any such development will be similar to the proposed development for the underlying land soils and hydrogeological regime.

In the event of a 'Do Nothing' scenario, the subject site would remain in operation as an existing ICT campus.

7.6 LIKELY IMPACTS OF THE PROJECT

An analysis of the potential impacts of the proposed development on the land, soils, geology and hydrogeological environment during the construction and operation is outlined below. Due to the inter-relationship between soils, geology and hydrogeology and surface water (hydrology) the following impacts discussed will be considered applicable to both Chapter 7 and 8 of the EIA Report. Remediation and mitigation measures included in the design of this project to address these potential impacts are presented in Section 7.6.1 and Section 7.6.2.

7.6.1 Construction phase

The following potential effects to land soil and groundwater have been considered:

- There was no evidence of waste deposited on-site during Site investigation works carried out by IGSL in 2019. Therefore the risk of contaminated soils being present onsite is low and this was confirmed by onsite soil sampling and analysis. Nonetheless material, which is exported from site, if not correctly managed or handled, could impact negatively on human beings (onsite and offsite) as well as water and soil environments.
- Excavation of soil, tarmac and hardcore will be required for both the principal works and some of the facilitation works (GNI Upgrades). The GNI upgrades will be delivered through

a local upgrade of the gas network over a length of approximately 1.5km Ryevale Lawns along Station Road, Old Hill and Celbridge Road for a distance of approximately 1.5km up to the entrance of Barnhall Meadows. The pipe will run under the existing road pavement. At the entrance to Barnhall Meadows, the pipe will run underground through the Barnhall Meadows lands (adjacent to the existing haul road) and will then cross the M4 Motorway through Horizontal Directional Drilling and enter the Kildare Innovation Campus then connecting to the proposed Gas Skid.

- Local removal and reinstatement (including infilling) of the 'protective' topsoil and subsoil cover across the development area at the site will not change the overall vulnerability category for the site which is already 'high to extreme'. Capping of the energy centre, data centre, deep tech buildings and the overall substation footprint of the site by hardstand/ building following construction and installation of drainage which will minimise the potential for contamination of the aquifer beneath the site: The Locally Important Bedrock Aquifer (Ll) which is moderately productive in local zones only. Site investigation and laboratory analysis has not identified any existing contamination with hazardous substances. Although, there is no soil quality data obtained along the route of the 110kV transmission line upgrades. No treatment of any water will be required during construction works. The entire uprating works will comprise only line and structural replacements and the interactions between the proposed works and land, soils, geology and hydrogeology will be negligible.
- The proposed development will require site preparation, excavations and levelling for foundations, the installation of services and landscaping. It is assumed that the material removed along the roadways for the GNI pipeline upgrades is expected to be contaminated. This material will be required to be removed and disposed by a licenced contractor to an appropriate waste facility.
- As with all construction projects there is potential for water (rainfall and/or groundwater) to become contaminated with pollutants associated with construction activity. Contaminated water which arises from construction sites can pose a significant short-term risk to groundwater quality for the duration of the construction if contaminated water is allowed percolate to the aquifer. The potential main contaminants include:
  - Suspended solids (muddy water with increased turbidity (measure of the degree to which the water loses its transparency due to the presence of suspended particulates)) – arising from excavation and ground disturbance;
  - Cement/concrete (increase turbidity and Ph) – arising from construction materials;
  - Hydrocarbons (ecotoxic) – accidental spillages from construction plant or onsite storage;
  - Wastewater (nutrient and microbial rich) – arising from poor on-site toilets and washrooms.

7.6.2 Operational phase

The following risks have been considered in relation to the operational phase of the development:

- There will be an increase in overall hardstand as a result of the development of c 171,641.88 m^2.
- The inherent SuDs design has been provided to control runoff frequency, flow rates, volumes and, reduce concentrations of contaminants to acceptable levels. The proposed treatment train approach assures that both runoff quantity and quality are addressed

through the overall techniques of pollution prevention, source control and regional control. Bioretention ponds with sediment forebay have been proposed in this framework as in integral element to the overall site attenuation system. The proposals provide an integrated and innovative surface water drainage design solution which manages water quality and quantity in accordance with Kildare County Council objectives.

- There is a potential for leaks and spillages from vehicles along access roads and in parking areas. Any accidental emissions of oil, petrol or diesel associated with fuel storage tanks for the energy centre and belly tanks for the data centres could cause soil/groundwater contamination if the emissions are unmitigated.
- In the event of a fire, firewater could become contaminated and in the absence of mitigation may contaminate soil and groundwater.
- Groundwater abstraction does not form part of the proposed development. There will be no impact on local or regional groundwater resources (abstraction) as a result of the proposed development.

The residual cumulative impact on land, soils, geology and hydrogeology for the construction and operation phases is anticipated to be ***Long-Term, Neutral*** in terms of quality and ***Not Significant***, once appropriate mitigation measures are implemented in accordance with the CEMP and in compliance with the legislative requirements for each development.

7.7 MITIGATION MEASURES AND MONIOTRING OF IMPACTS

In order to reduce impacts on the soils, geological and hydrogeological environment, a number of mitigation measures will be adopted as part of the construction works on site.

7.7.1 Construction Phase

This section describes a range of mitigation measures designed to avoid or reduce any potential adverse geological and hydrogeological impacts identified.

Construction Environment Management Plan

A Construction & Environmental Management Plan (CEMP) has been prepared in respect of the proposed development (refer to CSEA's CEMP).It contains best practice measures and protocols to be implemented during the construction phase of the proposed development to avoid/minimise environmental impacts.

To ensure the CEMP remains fit for purpose, it will be regarded as a live document. The appointed contractor will be responsible for updating the CEMP, as required; e.g. to reflect the publication of relevant new or revised guidelines and / or new statutory requirements. The full schedule of environmental commitments (i.e. all mitigation measures set out in the CEMP, Environmental Impact Assessment Report and submitted as part of the planning application, as well as any applicable conditions of development consent) will be included in the CEMP by the appointed contractor.

The CEMP was formulated in accordance with best international practice including but not limited to:

- Construction Industry Research and Information Association CIRIA, (2001), Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- Construction Industry Research and Information Association (CIRIA) Environmental Good Practice on Site (C650), 2005;
- BPGCS005, Oil Storage Guidelines;
- Eastern Regional Fisheries Board, (2016), Guidelines on protection of fisheries during construction works in and adjacent to waters; and
- CIRIA 697, The SUDS Manual, 2007;

Culvert Works

It is proposed to redesign the culvert as part of the proposed scheme. As per the CSEA CEMP the proposed design of the culvert will ensure that there is no reduction in the hydraulic capacity of the culvert and no resultant increase in flood risk. The new culvert will be built as part of the phase 1 development. The new culvert route will be constructed prior to the decommissioning of the existing culvert. This will ensure minimal operational disturbance of the existing infrastructure. The contractor will begin the works by initially excavating the proposed route for the new culvert. The proposed culvert will then be fully constructed except for the tie-in locations to the existing culvert. Once the proposed culvert is constructed, cleaned, and inspected the tie-in locations to the existing culvert will be completed. This will ensure minimal operational disturbance to the existing infrastructure. Once the existing water course has been diverted through the new route, the existing culvert will be removed. The proposed diverted culvert will be c.360m in length, located c.90 south-west of the existing culvert. The work will be achieved over 8 weeks. As per the AA Screening Report findings, no significant effects whether arising from the project itself or in combination with any other plan or project, are likely to occur to the Natura 2000 sites largely due to the significant distance of the project from the identified sites. Notwithstanding this, best practice environmental controls will be put in place as per the balance of the site to ensure no damage to the immediate aquatic receiving environment. Run-off from the site or any area of exposed soils should be channelled and intercepted and discharged to silt traps with over-flows directed to land rather than the existing culvert. A maintenance schedule and operation procedure should be implemented by the Contractor for the silt and pollution control measures during the construction of the diverted culvert.

Control of Soil Excavation

Site preparation, excavations and levelling works required to facilitate construction of foundations, access roads and the installation of services will require imported material.

- Suitable soils will be reused on site as backfill in the grassed areas, where possible.
- Contractors shall be required to submit and adhere to a method statement indicating the extent of areas likely to be affected and demonstrating that this is the minimum disturbance necessary to achieve the required works.
- Temporary storage of soil will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any open surface water drains. No soil storing will be allowed within 30 m of any open water including the existing retention ponds which is likely achievable given the size of the site, and is in line with Inland Fisheries Ireland guidelines.

- Movement of material will be minimised in order to reduce degradation of soil structure and generation of dust.
- Although there is no evidence of historical contamination in the proposed development area, all excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. Should any unusual staining or odour be noticed, samples of this soil will be analysed for the presence of possible contaminants in order to ensure that historical pollution of the soil has not occurred. Should it be determined that any of the soil excavated is contaminated, this will be disposed of by a licensed waste disposal contractor.
- Stockpiles have the potential to cause negative impacts on air and water quality. Stockpiles will be formed within the proposed development site boundary and the contractor will ensure that there are no direct links or pathways from stockpiles to any surface water body.
- Overburden material will be protected from exposure to wind by storing the material in sheltered parts of the site, where possible.

Sources of Fill & Aggregates

All fill and aggregate for the proposed development will be sourced from reputable suppliers. All suppliers will be vetted for:

- Aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development;
- Environmental management status; and
- Regulatory and legal compliance status of the company.

Fuel & Chemical Handling

To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas. Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.

Refuelling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or, where possible, off the site) that will be away from surface water gullies or drains. In the event of a machine requiring refuelling outside of this area, fuel will be transported in a mobile double skinned tank. An adequate supply of spill kits and hydrocarbon adsorbent packs will be stored in this area. All relevant personnel will be fully trained in the use of this equipment. Guidelines such as 'Control of Water Pollution from Construction Sites: Guidance for Consultants and Contractors' (CIRIA 532, 2001) will be complied with.

Where feasible, all ready-mixed concrete will be brought to site by truck. A suitable risk assessment for wet concreting will be completed prior to works being carried out, which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil. Wash down and washout of concrete transporting vehicles will take place at an appropriate facility off-site.

In the case of drummed fuel or other chemical which may be used during construction, containers should be stored in a dedicated internally bunded chemical storage cabinet and labelled clearly to allow appropriate remedial action in the event of a spillage.

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

Control of Water during Construction

There shall not be any discharge of ***untreated***, silty, or contaminated water from the works to any watercourse or stormwater network.

The implementation of industry best practice and full adherence to the mitigation measures set out in the CEMP can largely mitigate against the risk of discharge from contaminated soils to receiving surface and ground waterbodies.

The discharge of ***treated*** construction water (i.e. water free from silt and other pollutants) from rainfall into excavated areas, or from any localised dewatering may be required during the construction phase. The treated water will discharge to the existing Leixlip Reservoir.

Pre-treatment and silt reduction measures on site will include a combination of silt fencing, settlement measures (silt traps, 20 m buffer zone between machinery and watercourses, refuelling of machinery off site) and hydrocarbon separator. These specific measures will provide protection to the receiving soil and water environments during the construction phase.

Operational Phase

A number of design measures will be put in place to minimise the likelihood of any spills entering the groundwater environment. An existing bypass petrol interceptor is located upstream of the outfall from the site, and it is proposed to retain this interceptor. Furthermore, it is a requirement for car parking areas with 10 spaces or more as outlined in Section 20.1 of the Greater Dublin Regional Code of Practice.

There is potential for surface water and condensate to accumulate in the exhaust stacks which serve the generators. Gullies which serve the exhaust stacks will discharge to a dedicated surface water drainage pipe which will be connected to a Class 1 full retention separator. Two full retention interceptors will be required, per data centre building, to serve the exhaust stacks. In the event of an accidental leakage of oil from the parking areas, this will be intercepted by the drainage infrastructure proposed.

The following mitigation measures will be undertaken at the operational stage to manage any leaks from vehicles resulting in soil and/or groundwater quality impacts:

- Provision of spill kit facilities and training of operatives in use of same;
- Where mobile fuel bowsers are used the following measures will be taken:
  - Any flexible pipe, tap or valve will be fitted with a lock and will be secured when not in use;
  - The pump or valve will be fitted with a lock and will be secured when not in use;
  - All bowsers to carry a spill kit;

- Operatives must have spill response training; and
- Portable generators or similar fuel containing equipment will be placed on suitable drip trays.

In relation to the principal works site, a number of inherent SuDS measures will be implemented to minimise the likelihood of any spills entering the surface water and groundwater environment to include the design of attenuation techniques such as Swales, Tree pits, Green roofs, Filter drains, Permeable paving, Rainwater Harvesting system, Bio-Retention ponds, Hydrocarbon interceptors, Silt Traps and Attenuation facilities..

As a result, the proposed development will result in a reduction of surface water discharge from the principal works site. This will have a net positive result on the surrounding hydrological and hydrogeological regime as the overall discharged runoff will have an improved water quality.

7.8 LIKELY CUMULATIVE AND INTERACTION IMPACTS OF THE PROJECT

The anticipated cumulative effect of the Proposed Development with any/all relevant other planned or permitted developments as outlined in Chapter 2 and 3 are discussed below for construction and operational phases respectively.

7.8.1 Construction Phase

In relation to the potential cumulative impact on the geological or hydrogeological environment during the construction phases, the key engineering works which would have additional impacts above are:

- Construction works will require additional removal of topsoil and subsoil cover and will further increase the vulnerability of the underlying bedrock. Although this is minimised due to the underlying clayey overburden. Capping of significant areas of the sites by hardstand/ buildings following construction and installation of drainage will minimise the potential for contamination of groundwater.

7.8.2 Operational Phase

In relation to the potential cumulative impacts from the operational stages, the following would apply:

- Overall increase in hardstanding: Cumulatively these developments will result in localised reduced recharge to ground and increase in surface run-off. The aquifer underlying the site is a locally important aquifer which is moderately productive only in local zones. The proposed development will have a relatively small footprint in comparison to the underlying aquifer size. As such, the impact is considered to be Low.
- Accidental releases from fuel storage/unloading could contaminate groundwater or soil environments unless mitigated adequately. Localised accidental discharge of hydrocarbons could occur in car parking areas and along roads unless diverted to surface

water drainage system with petrol interceptors. However, all developments are required to ensure they do not have an impact on the receiving water environment in accordance with the relevant legislation (primarily the Local Government (Water Pollution) Act, 1977 and 1990 as amended and Groundwater Threshold Value (Groundwater Directive S.I. No. 9 of 2010 and amendment; S.I. No. 366 of 2016) and EPA Interim Guidelines for groundwater where available) such that they would be required to manage runoff and fuel leakages.

- There will be a further loss of greenfield area locally however, the area of development is small in the context of the overall agricultural land available in the region. It is likely that the land use will change over time based on the current zoning of the proposed land in the vicinity as EE. The site is an existing underdeveloped business campus, zoned for 'Industry and Warehousing' in *the Leixlip Local Area Plan 2020-2023 (extended to 2026).*
- The residual cumulative effect on land, soils, geology and hydrogeology for the construction and operation phases are anticipated to be long-term, neutral in terms of quality and of not significant, once the appropriate mitigation measures are put in place for each development.

7.8.3 Interaction Impacts with Hydrology

Construction Phase

The construction phase of the proposed development has the potential to result in increased sediment runoff which has the potential to interact negatively on surface water quality. The proposed construction phase mitigation means that the proposed development will not result in significant negative impact on surface water quality in the local area.

Taking into account the design and mitigation measures set out in Chapter 6 and 7 of this EIA Report, there is a residual negative interaction between land, soil, and hydrology during the construction phase. The interaction is considered to be ***neutral***, ***not significant***, and ***short term***.

Operational Phase

Taking into account the design and mitigation measures set out in 6 (Hydrology) and Chapter 7 (Land, Soils and Hydrogeology) of this EIA Report there are no potentially significant interactions identified between land, soils and hydrogeology, and hydrology during the operational phase.

7.8.4 Interaction Impacts with Biodiversity

Construction Phase

In the absence of standard mitigation measures to control the construction phase there is potential for silt laden material or pollution to enter the watercourse and impact on local biodiversity and European sites downstream from the works. Furthermore, dust emissions

from exposed earthworks have the potential to settle on plants causing impacts to local ecology.

Taking into account the design and mitigation measures outlined in this Section 7.7, there still remains a residual negative interaction between land, soils, geology and hydrogeology and biodiversity during the construction phase. The interaction is considered to be ***negative, not significant***, and ***short term***.

Operational Phase

There are no potentially significant interactions identified between land, soils and hydrogeology, and biodiversity during the operational phase.

7.8.5 Interaction Impacts with Air Quality and Climate

Construction Phase

Demolition and construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils and the water environment (hydrology) in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that interactions between air quality and land and soils and hydrology will be ***short-term*** and ***imperceptible***.

Operational Phase

There are no potentially significant interactions identified between land, soils and hydrogeology, and air quality and climate during the operational phase

7.8.6 Noise and Vibration

Construction Phase

There are no potentially significant interactions identified between land, soils and hydrogeology, and noise and vibration during the construction phase.

Operational Phase
There are no potentially significant interactions identified between land, soils and hydrogeology, and noise and vibration during the operational phase.

7.8.7 Landscape and Visual Impacts

Construction Phase

There are no potentially significant interactions identified between land, soils and hydrogeology, and landscape and visual impacts during the construction phase.

Operational Phase

There are no potentially significant interactions identified between land, soils and hydrogeology, and landscape and visual impacts during the operational phase.

7.8.8 Archaeological, Architectural and Cultural Heritage

Construction Phase

There are no potentially significant interactions identified between hydrology, and archaeological, architectural and cultural heritage during the construction phase.

Operational Phase

There are no potentially significant interactions identified between land, soils and hydrogeology, and archaeological, architectural and cultural heritage during the operational phase.

7.8.9 Material Assets, including Utilities, Waste, and Transport

Construction Phase

There are no potentially significant interactions identified between land, soils and hydrogeology, and material assets during the construction phase.

Operational Phase

The proposed development will follow the SuDS and surface water management strategy; utilising an innovative natural based SuDS components to provide the necessary processes to control runoff frequency, flow rates and volumes. The use of SuDS during operations will mean that the runoff will discharge from the proposed bioretention and attenuation systems before out falling to the existing pond system and existing monitoring regime on-site resulting in a reduction of surface water discharge from the development site. This will have a net positive result on the downstream surrounding areas as the potential for flooding will be reduced and the overall discharged runoff will have an improved water quality due to the proposed SuDS upgrades. The SuDs features have been designed to provide sufficient capacity to contain and convey all surface water runoff associated with the 1 in 100-year event plus an additional allowance of 30% for climate change and 10% urban creep. This is as per Kildare County Council Water Services Department draft guidance on Drainage and SuDS Strategy.

Attenuation measures include bio retention areas, attenuation ponds, swales, filter drains, permeable paving and hydrocarbon interceptors. The interaction is considered to be ***negative***, ***not significant***, and ***long-term***.

7.9 MAJOR ACCIDENTS

The EPA Guidelines, 2022, state that:

> *"To address unforeseen or unplanned effects the Directive further requires that the EIAR takes account of the vulnerability of the project to risk of major accidents and /or*

disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). This may be supported by general risk assessment methods or by systematic risk assessments required under other legislation e.g. a COMAH (Control of Major Accident Hazards involving Dangerous Substances) assessment.

The potential for a project to cause risks to human health, cultural heritage or the environment due to its vulnerability to external accidents or disasters is considered where such risks are significant, e.g. the potential effects of floods on sites with sensitive facilities. Where such risks are significant then the specific assessment of those risks in the form of a Seveso Assessment (where relevant) or Flood Risk Assessment may be required."

Much of the earth's surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating slope failure. Instability is often significantly increased by man's activities in building houses, roads, drainage and agricultural changes. Landslides, mudflows, bog bursts (in Ireland) and debris flows are a result. In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff and leads to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities. The GSI landslide database was consulted and the nearest landslide to the proposed development was c.7.5km to the north, referred to as the Diswellstown event which occurred on 24th December 1999. There have been no recorded landslide events at the site. Due to the local topography and the underlying strata, there is a negligible risk of a landslide event occurring at the site.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics at the Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently, there are five permanent broadband seismic recording stations in Ireland and operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events. Records since 1980 show that the nearest seismic activity to the proposed location was in the Irish sea c. 30km to the east of the site (1.0 – 2.0 Ml magnitude) and ~55 km to the south in the Wicklow Mountains. There is a very low risk of seismic activity to the proposed development site. There are no active volcanoes in Ireland so there is no risk from volcanic activity. ReFER TO Chapter 17 – Major Accidents and Disasters for further detail.

7.10 MONITORING

7.10.1 Construction Phase

During construction phase the following monitoring measures will be implemented:

- Regular inspection of surface water run-off and sediments controls (e.g., silt traps);
- Soil sampling to confirm disposal options for excavated soils in order to avoid contaminated run-off; and

- Regular inspection of construction / mitigation measures (e.g. concrete pouring, refuelling, etc).

7.10.2 Operational Phase

Maintenance of the surface water drainage system, including interceptors, and foul sewers is recommended to minimise any accidental discharges to soil or groundwater.

7.11 RESIDUAL IMPACTS

The proposed development with mitigation will have no significant impact on the natural groundwater regime either qualitatively or quantitatively.

7.11.1 Construction Phase

Following the implementation of mitigation measures detailed in Section 5.6.1 above, the predicted impact on the geological and hydrogeological environment during the construction phase is ***neutral, imperceptible*** and ***short-term,*** the magnitude of impact is considered ***negligible***.

7.11.2 Operational Phase

Following the implementation of mitigation measures detailed in Section 5.6.2 above, the predicted impact on the geological and hydrogeological environment during the construction phase is ***neutral, imperceptible*** and ***long-term,*** the magnitude of impact is considered ***negligible***.

7.12 REFERENCES

- CIRIA (2001). Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- CIRIA (2005). Environmental Good Practice on Site (C650).
- CIRIA (2007). CIRIA 697: The SUDS Manual.
- Enterprise Ireland (n.d.). Best Practice Guide BPGCS005: Oil Storage Guidelines.
- EPA (2022a). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- EPA (2022b). EPA Maps.
- GSI (2022). GSI Map Viewer.
- Institute of Geologists of Ireland (2013). Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.
- NPWS (2022). Designations Viewer.
- NRA (2009). Guidelines on Procedures for Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.
- OPW (2022). Flood Maps.
- OPW (2009). The Planning System and Flood Risk Management: Guidelines for Planning Authorities.
- Institute of Geologists of Ireland (2013). Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.

- Dublin City Council (2005). Greater Dublin Strategic Drainage Study: Technical Documents of Regional Drainage Policies. Dublin: Dublin City Council.
- Teagasc (2022). Teagasc Map Viewer.
- National Roads Authority (NRA) (2009). Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.