



Enviroguide

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Volume 2: EIAR

PRESENTED TO

**Rathcool Flying Club
Townland of Rathcoole, Co. Cork**

DATE

February 2026

Environmental Consultancy Services

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1 INTRODUCTION AND METHODOLOGY

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) has been prepared by Enviroguide Consulting (now DNV) for Rathcool Flying Club, herein after referred to as the Applicant, who is seeking planning permission for the construction of a hard surfaced runway (740m in length), taxiway and helipad with associated ground level lighting, associated interceptors, along with the relocation of an existing hanger, paramedic prefabricated base, crew prefabricated bases and all associated works at the townland of Rathcool, Co. Cork.

The application (Planning Reg Ref 254538), including this EIAR, was lodged on the 27th March 2025. A Request for Further Information (RFI) was received from Cork County Council on the 20th May 2025, requesting additional information.

This EIAR has been updated to reflect the requested information and the changes made as a result of the RFI.

This EIAR was originally prepared and submitted by Enviroguide Consulting. Following the integration of Enviroguide Consulting into DNV, all updates and supplementary information are now provided under DNV. The content and authorship remain consistent with the original submission, ensuring continuity and transparency.

A detailed description of the Proposed Development is provided in Chapter 3 of this Environmental Impact Assessment Report.

This EIAR has been compiled in accordance with all current legislation and good practice guidance.

This chapter describes the methodology by which the Environmental Impact Assessment (EIA) was carried out and the EIAR was completed. The methodology used is broadly consistent across all chapters to ensure the EIAR is clear to navigate for the reader.

1.2 Definition of EIA and EIAR

Environment Impact Assessment (EIA) is a systematic examination of the potential impacts of a Proposed Development on the environment. In assessing the environmental impacts, this Environmental Impact Assessment Report (EIAR) evaluates the existing situation and assesses any potential impacts of the Proposed Development. Where potential impacts are identified proposed mitigation measures will be detailed. In addition, the in-combination effects of any other known plans or projects will be identified and assessed.

Under Schedule 5 of the Planning and Development Regulations 2001, as amended (the Planning Regulations), an EIAR is required to accompany planning applications for specified projects as part of the EIA process. The EIAR describes the outcomes of the iterative EIA process which was progressed in parallel with the project design process. Where likely significant environmental effects are identified that are unacceptable, the EIA process aims to quantify and minimise the effects of the impact that the specified development has on the

environment through appropriate mitigation measures and where necessary, subsequent monitoring.

This process is illustrated in figure 1-1 below.

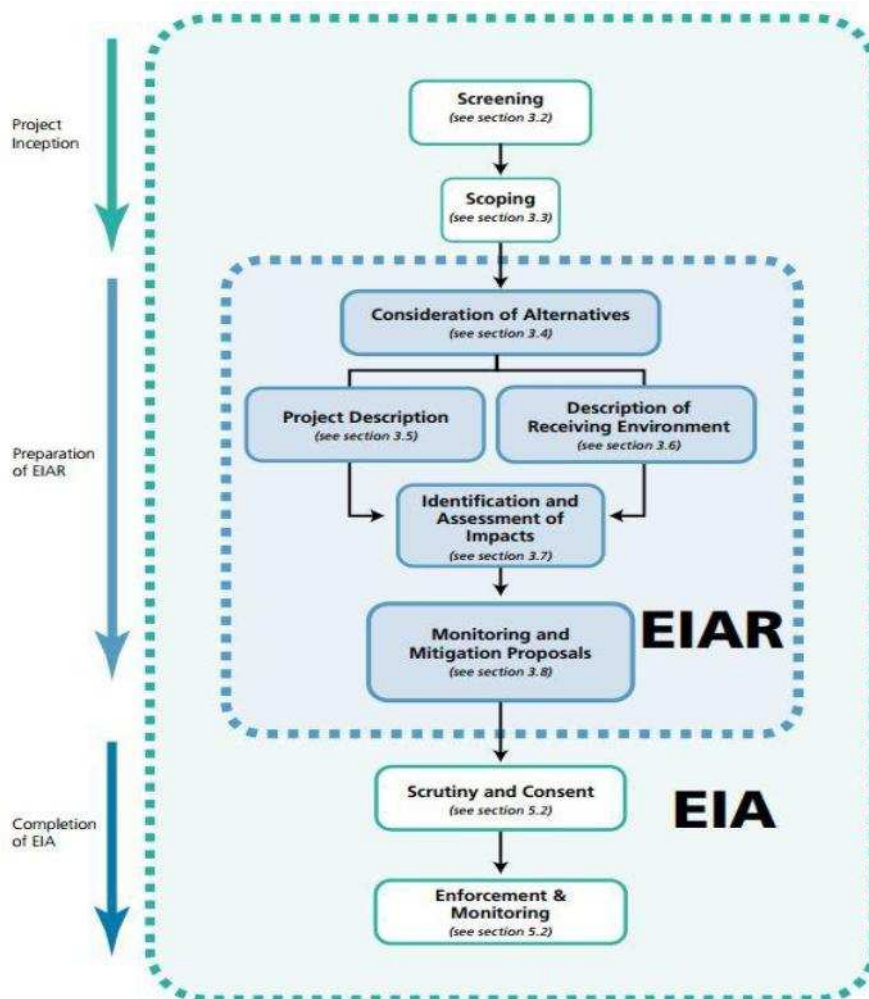


Figure 1-1: EIA Process

The purpose of the EIAR is to provide the relevant competent authority with information on the likely and significant effects on the environment by the Proposed Development. This EIAR was prepared in parallel with the project design process and reflects the potential cumulative impact of other developments.

1.3 Quality Assurance and Competency of Experts

Under Article 5(3)(a) of Directive 2014/52/EU it is a requirement that:

“the developer shall ensure that the environmental impact assessment report is prepared by competent experts”

This EIAR has been prepared by Enviroguide Consulting (now DNV), supported by sub-consultants on certain specialist assessments (see Table 1-4, page number 1-15).

This chapter was prepared by Lakshmi Priya Mohan, Environmental Consultant with Enviroguide Consulting (now DNV). Lakshmi has a Master of Science in Environmental Science degree from University College Dublin, Master of Science degree in Zoology from Ethiraj College for Women, India, and Bachelor of Science in Zoology from Madras Christian College India. Lakshmi has worked as an Environmental Consultant with Enviroguide since 2023 and is now a part of the DNV team. Lakshmi has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Effects Interactions and Mitigation and Monitoring chapters of the EIARs.

This chapter was updated by Rachel Redmond, Environmental Consultant with Enviroguide (now DNV). Rachel has a Bachelor of Science (Hons) in Environmental Science from University College Cork. Rachel has worked as an Environmental Consultant with Enviroguide since 2023 and is now a part of the DNV team. Rachel has 4 years of experience as an environmental consultant preparing Environmental Impact Assessment Reports of a similar scale and nature to the Proposed Development.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at Enviroguide (now DNV). Catherine is an environmental consultant with 37 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

For each chapter of this EIAR, the author, qualifications, and experience of working on other development projects are detailed. The EIAR Project Team are identified in Table 1-4 below.

1.4 EIA Legislation

The EIA Directive requires EIA to be carried out for certain projects as listed in Annex I of the Directive. The EIA Directive is transposed into Irish law through the Planning and Development Act 2000, as amended, and the Planning and Development Regulations 2001, as amended.

1.5 EIA Guidelines

This EIAR has been prepared in accordance with all relevant guidance. The documents listed below are common to all chapters. Additional specific guidelines will be referred to in each specific chapter.

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA May 2022);
- Environmental Assessments of Plans, Programmes and Projects – Rulings of the Court of Justice of the European Union (European Union 2017);
- Environmental Impact Assessment of Projects – Guidance on Scoping (Directive 2011/92/EU as amended by 2014/52/EU) (European Union 2017);
- Guidance of Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Union 2013);

- Environmental Impact Assessment of Projects – Guidance on the preparation of the Environmental Impact Assessment Report (European Union 2017);
- European Commission 2017. Environmental Impact Assessment of Projects Guidance on Screening (Directive 2011/92/EU as amended by 2014/52/EU);
- EU Commission Guidance on Interpretation of definitions of project categories of annex I and II of the EIA Directive (2015);
- 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 Communities 1999);
- Implementation of Directive 2001/42/EC on the assessment of the effects of certain plans and programmes on the environment (European Communities 2003); and
- Office of the Planning Regulator (OPR) Environmental Impact Assessment Screening Practice Note (2021).

The EIA Directive defines EIA as a process whereby Article 1(2)(g) states that EIA means:

“(i) the preparation of an environmental impact assessment report by the developer, as referred to in Article 5(1) and (2);

(ii) the carrying out of consultations as referred to in Article 6 and, where relevant, Article 7;

(iii) the examination by the competent authority of the information presented in the environmental impact assessment report and any supplementary information provided, where necessary, by the developer in accordance with Article 5(3), and any relevant information received through the consultations under Articles 6 and 7;

(iv) the reasoned conclusion by the competent authority on the significant effects of the project on the environment, taking into account the results of the examination referred to in point;

(iii) and, where appropriate, its own supplementary examination; and

(v) the integration of the competent authority's reasoned conclusion into any of the decisions referred to in Article 8a”.

The EIA Directive requires the EIAR to identify, describe and assess, in an appropriate manner and in light of each individual case, the direct, indirect and cumulative significant effects of the Proposed Development on factors of the environment including:

- a) population and human health*

- b) *biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC (respectively, the Habitats Directive and the Birds Directive)*
- c) *land, soil, water, air and climate*
- d) *material assets, cultural heritage and the landscape*
- e) *the interaction between the factors referred to in points (a) to (d)*

1.6 Screening for EIA

'Screening' is the term used to describe the process for determining whether a Proposed Development requires an EIA by reference to mandatory legislative threshold requirements or in the case of sub threshold development, by reference to the type and scale of the Proposed Development and the significance or the environmental sensitivity of the receiving baseline environment. Annex 1 of the EIA Directive requires as mandatory an EIA for all development projects listed therein. Schedule 5, Part 1, of the Planning Regulations transposes Annex 1 of the EIA Directive directly into Irish planning legislation. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning Regulations which exceeds a limit, quantity or threshold set for that class of development. The Proposed Development is not considered to fall under any class set out in Schedule 5, Part 1 of the Planning Regulations.

Schedule 5, Part 2 of the Planning and Development Regulations 2001 as amended, defines projects that are assessed on the basis of set mandatory thresholds for each of the project classes including:

"Schedule 5, Part 2 - Infrastructure projects

10 (d) All airfields not included in Part 1 of this Schedule with paved runways which would exceed 800 metres in length.

The Proposed Development has a length of 740m for the hard surface runway. Having regard to the fact that the Proposed Development is 60m less than the 800metre threshold, the Applicant has prepared an Environmental Impact Assessment Report.

1.7 Scope of the EIAR

'Scoping' is a process of deciding what information should be contained in an EIAR and what methods should be used to gather and assess that information. It is defined in EC Guidance on EIA Scoping 2001 as:

"Determining the content and extent of the matters which should be covered in the environmental information to be submitted in the EIAR".

The content of this EIAR was informed by a scoping process carried out by the Applicant, design team and EIAR consultants to identify the core issues likely to be most important during the EIA process.

The EIAR prepared for the Proposed Development has endeavoured to be as thorough as possible and therefore all the issues listed in Schedule 6, Sections 1 and 2 of the Planning and Development Regulations have been addressed in the EIAR.

The scope of this EIAR has had regard to the documents listed in Section 1.5 together with:

- The requirements of Part X of the Planning Act and Part 10 of the Planning Regulations.
- The requirements of the Cork County Development Plan 2022-2028
- Relevant Regional and National Planning Policy Documents.
- The receiving environment and any vulnerable or sensitive local features and current uses.
- Previous relevant planning history and applications that have been submitted on the subject and adjoining lands.
- The likely and significant impacts of the Proposed Development on the environment; and
- Available mitigation measures for reducing or eliminating any potentially significant undesirable impacts.

In addition, the individual chapters of this EIAR should be referred to for further information on the documents consulted by each individual consultant.

1.8 Purpose and Objective of the EIAR

The purpose of this EIAR is to assist in the EIA process, by identifying likely significant environmental impacts resulting from the Proposed Development, to describe the means and extent by which they can be reduced or mitigated, to interpret and communicate information about the likely impacts and to provide an input into the decision making and planning process.

The fundamental principles to be followed when preparing an EIAR are:

- Anticipating, avoiding and reducing significant effects.
- Assessing and pursuing preventative action.
- Maintaining objectivity.
- Ensuring clarity and quality.
- Providing relevant information to decision makers; and
- Facilitating public and stakeholder consultation.

EIA is an iterative process. The EIAR captures this assessment process and describes its outcomes. The EIAR documents the consideration of environmental effects and provides transparent, objective and replicable documentary evidence of the EIA evaluation and decision-making processes. The EIAR provides information on any identified effects arising as a consequence of the Proposed Development and which:

- Are environmentally based.
- Are likely to occur; and
- Have significant and adverse effects on the environment.

The EIAR also documents how the design of the Proposed Development incorporates measures for the purposes of impact avoidance, reduction or amelioration; as well as to explain how significant adverse effects will be avoided.

The key objective of this EIAR is to inform the relevant competent authority on the acceptability of the Proposed Development, in carrying out an EIA, in order to reach a decision in the full knowledge of the Proposed Development's likely significant impacts on the environment, if any.

1.9 Format and Structure of this EIAR

The formation of an EIAR necessitates the co-ordination and collation of associated, yet diverse specialised areas of assessment. The EIA approach involves the examination of each environmental factor, describing the existing baseline environment, the Proposed Development, its likely impacts and direct and indirect significant effects pertaining to that environmental factor and mitigation measures, where appropriate.

Each technical assessment sets out the relevant legislation, policy, and guidance together with the methodology used to carry out the assessment of potential effects, including the criteria that are used to establish which effects are significant. The significance criteria follow that as defined in the EPA 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' 2022¹ as shown in Table 1-1 below.

Table 1-1 Description of Effects

Category	Type and Description
Quality of Effects It is important to inform the non-specialist reader whether an effect is positive, negative or neutral.	Positive Effects A change which improves the quality of the environment (for example, by increasing species diversity, or improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effects No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
	Negative/Adverse Effects A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance)

¹ https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

Category	Type and Description
Describing the Significance of Effects <i>'Significance'</i> is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (<i>also see Determining Significance</i>).	Imperceptible An effect capable of measurement but without significant consequences.
	Not Significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight Effects An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate Effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant Effects An effect which, by its character, magnitude, duration or intensity, alters a sensitive aspect of the environment.
	Very Significant An effect which, by its character, magnitude, duration or intensity, significantly alters most of a sensitive aspect of the environment.
	Profound Effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects Context can affect the perception of significance. It is important to establish if the effect is unique or, perhaps, commonly or increasingly experienced.	Extent Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration or frequency will conform or contrast with established (baseline) conditions.
	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.

Category	Type and Description
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Probability of Effects Descriptions of effects should establish how likely it is that the predicted effects will occur so that the CA can take a view of the balance of risk over advantage when making a decision.	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely Effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Describing the Duration and Frequency of Effects ‘Duration’ is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.	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).
Describing the Types of Effects	Indirect Effects (a.k.a. Secondary or Off-site Effects) Effects on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
	‘Do-nothing Effects’

Category	Type and Description
	The environment as it would be in the future should the subject project not be carried out.
	'Worst-case' Effects The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable Effects When the full consequences of a change in the environment cannot be described.
	Irreversible Effects When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual Effects The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic Effects Where the resultant effect is of greater significance than the sum of its constituents (e.g. combination of SO _x and NO _x to produce smog)

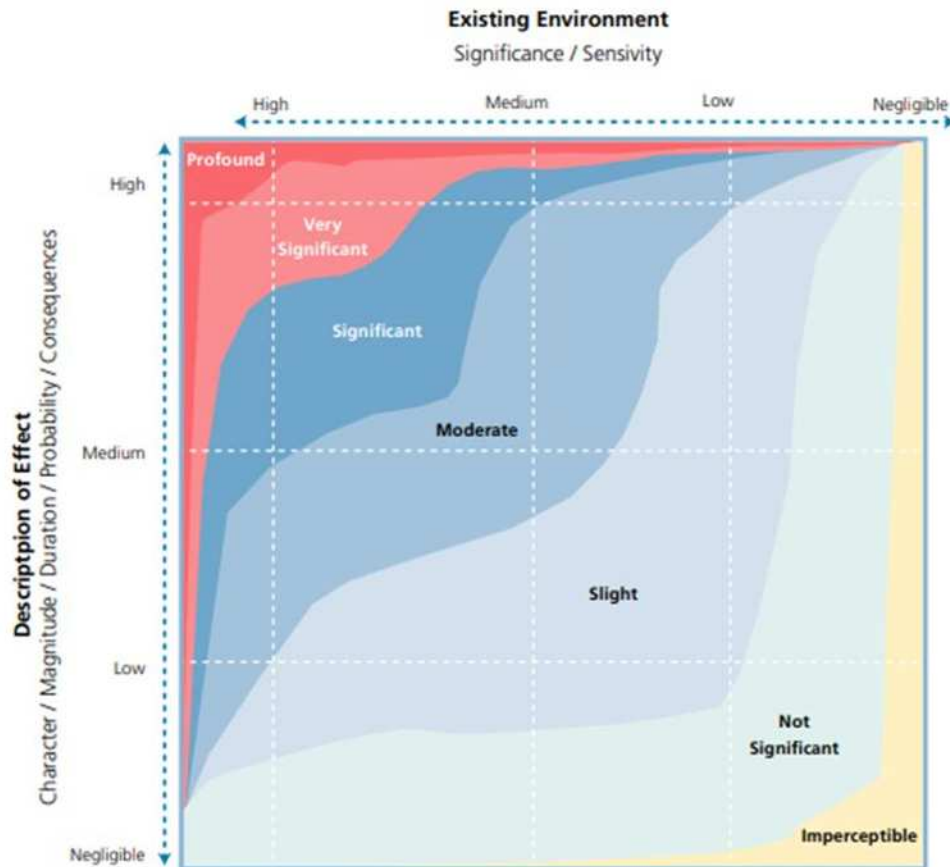


Figure 1-2 :Determining the Significance of the Effect (EPA 2022)

The topics examined in this EIAR are categorised under the environmental factors prescribed under the EIA Directive:

- Population and Human Health.
- Biodiversity.
- Land and Soils.
- Water.
- Air Quality and Climate.
- Material Assets.
- Cultural Heritage; and
- Landscape and Visual.

The potential likely significant effects caused by the vulnerability of the Proposed Development to risks of major accidents and/or disasters must also be examined.

The structure of the EIAR is set out in Table 1-2 below.

Table 1-2: Structure of the Environmental Impact Assessment Report (EIAR)

Chapter	Title	Content
1	Introduction and Methodology	Chapter 1 sets out the purpose, methodology and scope of the document.
2	Site Description	As required under Article 5(1)(a) of the EIA Directive, Chapter 2 provides a description of the site.
3	Description of the Proposed Development	As required under Article 5(1)(a) of the EIA Directive, Chapter 3 provides a description of the Proposed development including the design and scale of Proposed Development, and as required under Article 5(d), an evaluation of the reasonable alternative design approaches.
4	Population and Human Health	Chapter 4 covers the requirement for assessment on potentially significant effects to population and human health as required under Article 3(1)(a) of the EIA Directive.
5	Biodiversity	Chapter 5 covers the requirement of Article 3(1)(b) to assess potentially significant effects on biodiversity (which previously referred only to 'fauna and flora'), having particular attention to species and habitats protected under the Habitats Directive and the Birds Directive.
6	Land and Soils	Chapter 6 covers the requirement under Article 3(1)(c) of the EIA Directive on Land and Soil to assess the type of soil and geology in the area of the Proposed Development and identifies any potentially significant effects.
7	Hydrology	Chapter 7 covers the requirement under Article 3(1)(c) of the EIA Directive to assess potentially significant effects to water quality arising from the Proposed Development. This chapter will assess any potential effects from pollution and discharges to surface water.
8	Air Quality	Chapter 8 covers the requirement under Article 3(1)(c) of the EIA Directive on Air to assess potentially significant effects to air quality in the surrounding environment.
9	Climate	Chapter 9 covers the requirement under Article 3(1)(c) of the EIA Directive on Climate to assess potentially significant effects to air quality in the surrounding environment.
10	Noise and Vibration	Chapter 10 covers the requirement to assess potentially significant effects from airborne noise and vibration as required under Article 3(1)(a) of the EIA Directive on Human Health.
11	Landscape and Visual Amenity	Chapter 10 covers the requirement under Article 3(1)(d) of the EIA Directive to assess potentially significant effects on the landscape. This chapter will assess any potential visual impacts to landscape caused by the Proposed Development.

Chapter	Title	Content
12	Archaeology and Cultural Heritage.	Chapter 11 covers the requirement under Article 3(1)(d) of the EIA Directive to assess potentially significant effects on cultural heritage.
13	Traffic	Chapter 12 sets out the transport and traffic effects that will be caused on nearby receptors due from increase vehicle movements during the construction phase and operational phase.
14	Material Assets _ Utilities and Waste Management	Chapter 13 covers the requirement under Article 3(1)(d) of the EIA Directive to assess potentially significant effects on material assets. This chapter will identify impacts to existing utilities and infrastructure from the development of the Proposed Development. Article 5(1), Annex IV, point 1(d) requires estimates of quantities and types of waste produced during construction and operation phase. Chapter 12 will also present an assessment of how resources and waste will be managed for the Proposed Development.
15	Risk Management	Chapter 14 covers the requirement under Article 3(2) of the EIA Directive, to include the expected effects deriving from the vulnerability of the Proposed Development to risks of major accidents and/or disasters.
16	Interactions	As required under Article 3(1)(e) of the EIA Directive, Chapter 15 provides an assessment of the interaction between all of the environmental aspects referred to in this EIAR.
17	Mitigation and Monitoring	Chapter 16 describes mitigation and monitoring as required under Article 5(1) of the EIA Directive in order to avoid, prevent, reduce, or if possible, offset any identified significant adverse effects on the environment and, where appropriate, describes any proposed monitoring arrangements.

This approach employs standard descriptive methods, replicable prediction techniques and standardised impact descriptions to provide an appropriate evaluation of each environmental topic under consideration.

1.10 Methodology Used to Produce this EIAR

The methodology employed to produce this EIAR is detailed in Table 1-3 below. The objective is to evaluate each environmental topic, both individually and collectively, in a systematic and objective manner.

The methodology will outline the methods used to describe the baseline environmental conditions as well as predict the likely impacts on the environment of the Proposed Development. The data and survey requirements for each chapter will vary depending on the

environmental topic and will be 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 professional judgement and experience.

All environmental topics require desktop reviews of all relevant data at a minimum. These desktop studies are 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.

Table 1-3 EIA Chapter Approach

Chapter	Description of Section
Introduction	Provides an overview of the specialist area and specifies the specialist who prepared the assessment.
Study Methodology	This subsection outlines the method by which the relevant impact assessment has been conducted within that chapter.
The Existing Receiving Environment (Baseline Situation)	This section will describe and assess the receiving environment, the context, character, significance and sensitivity of the baseline receiving environment into which the Proposed Development will fit. This analysis also takes account of any other proposed developments that are likely to proceed in the immediate surroundings.
Characteristics of the Proposed Development	Consideration of the ' <i>Characteristics of the Proposed Development</i> ' allows for a projection of the ' <i>level of impact</i> ' on any particular aspect of the environment that could arise. For each chapter those characteristics of the Proposed Development which are relevant to the area of study are described; for example, the chapter on landscape and visual impact addresses issues such as height, design and impact on the surrounding landscape.
Potential Impact of the Proposed Development	This section provides a description of the specific, direct and indirect, effects that the Proposed Development may have. This analysis is provided with reference to both the Existing Receiving Environment and Characteristics of the Proposed Development sections, while also referring to the: (i) magnitude and intensity, (ii) integrity, (iii) duration and (iv) probability of impacts. The assessment addresses whether the impacts are direct, indirect, secondary or cumulative in nature. It also looks at the timescale of such impacts e.g. are they short, medium, long-term, and are they of a temporary, permanent, continuous or intermittent nature, and are they positive or negative impacts. The impact interactions are also addressed.
Residual Impacts of the Proposed Development	This section allows for a qualitative description of the resultant specific direct, indirect, secondary, cumulative, short, medium and long-term, temporary, permanent, continuous, or intermittent, positive and negative effects as well as impact interactions which the Proposed Development may have, assuming all mitigation measures are fully and successfully applied.

Chapter	Description of Section
Do Nothing Impact	In order to provide a qualitative and equitable assessment of the Proposed Development, this section considers the Proposed Development in the context of the likely impacts upon the receiving environment should the Proposed Development not take place.
Avoidance, Remedial and Mitigation Measures	This section of each chapter describes the mitigation measures which are required. The requirement to describe mitigation measures is laid out in the EIA Directive, as implemented by the Planning Act and the Planning Regulations. Avoidance, remedial and mitigation measures describe any corrective or mitigative measures that are either practicable or reasonable, having regard to the potential impacts of the Proposed Development. This includes avoidance, reduction and remedy measures as set out in Section 4.7 of the Development Management Guidelines 2007, to reduce or eliminate any significant adverse impacts identified.
Monitoring	This involves a description of monitoring in a post-development phase, if required. This section addresses the effects that require monitoring, along with the methods and the agencies that are responsible for such monitoring.
Reinstatement	While not applicable to every aspect of the environment considered within the EIAR, certain measures may need to be proposed to ensure that in the event of the proposal being discontinued, there will be minimal impact to the environment.
Interactions	This section provides a description of impact interactions together with potential indirect, secondary and cumulative impacts.
Difficulties Encountered in Compiling Information	The EIA Directive requires that the EIAR includes ' <i>details of difficulties (for example technical deficiencies or lack of knowledge) encountered compiling the required information, and the main uncertainties involved</i> ' (EIA Directive, Annex IV, Part 6). Each chapter that contains an environmental baseline and assessment contains a section outlining any difficulties encountered in compiling that chapter.

1.11 EIAR Project Team

The EIAR authoring team is set out in Table 1-4.

Table 1-4 EIAR Project Team

No.	Chapter	Consultant Name and address	Specialist Area
1	Introduction	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Lakshmi Priya Mohan Updated by Lakshmi Priya Mohan and Rachel Redmond	Multidisciplinary Planning and Environmental Consultants (specialising in Environmental Impact Assessment)
2	Site Description		
3	Description of the Proposed Development		

No.	Chapter	Consultant Name and address	Specialist Area
4	Population and Human Health	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Rachel Redmond Updated by Rachel Redmond	Multidisciplinary Planning and Environmental Consultants (specialising in Environmental Impact Assessment)
5	Biodiversity	Greenleaf Ecology, West End, Knocknagree Mallow, Co. Cork Karen Banks Updated by Karen Banks	Ecological Consultancy
6	Land and Soil	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Gareth Carroll Updated by Cormac Hennessy	Multidisciplinary Planning and Environmental Consultants (specialising in impact assessment of land and soil)
7	Hydrology	IE Consulting, Innovation Centre, Green Road, Carlow Joanne Mackey Updated by Joanne Mackey	Multidisciplinary Planning and Environmental Consultants (specialising in impact assessment of water)
8	Air Quality	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Laura Griffin Updated by Laura Griffin	Multidisciplinary Planning and Environmental Consultant (specialising in impact assessment of air quality)
9	Climate	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Leah Moloney	Multidisciplinary Planning and Environmental Consultant
10	Noise and Vibration	ICAN Acoustics, 9 St Mary's Rd Galway H91 Td56 Connacht Diarmuid Keaney Updated by Diarmuid Keaney	Environmental and Occupational Health and Safety consultancy (specialising in Air Quality and Odour Impact Assessments and Noise and Acoustic Assessments)
11	Landscape and Visual Impact Assessment	O'Meara Landscaping, 2 McSweeney St Fermoy, Co. Cork	Landscape Architecture Company

No.	Chapter	Consultant Name and address	Specialist Area
		Cathal O'Meara Updated by Cathal O Meara	
12	Archaeology and Cultural Heritage	John Cronin & Associates 3a Westpoint Business Centre Link Road Ballincollig Co. Cork Tony Cummins Updated by Tony Cummins	Multi-disciplinary environmental, planning and heritage resource management consultancy
13	Material Assets - Traffic	MHL & Associates Ltd. Unit 1B, The Atrium, Blackpool, Cork. T23T2VY James Daly Updated by James Daly	Consulting Engineers
14	Material Assets - Waste Management and Utilities	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Rachel Redmond Updated by Rachel Redmond	Multidisciplinary Planning and Environmental Consultants
15	Risk Assessment	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Rachel Redmond and Lakshmi Priya Mohan Updated by Rachel Redmond and Lakshmi Priya Mohan	Multidisciplinary Planning and Environmental Consultants
16	Interactions	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Lakshmi Priya Mohan Updated by Lakshmi Priya Mohan	Multidisciplinary Planning and Environmental Consultants
17	Summary of Mitigation Measures	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Lakshmi Priya Mohan Updated by Lakshmi Priya Mohan	Multidisciplinary Planning and Environmental Consultants
NTS	Non-Technical Summary	Enviroguide (now DNV) 3D Core C, The Plaza, Park West, D12F9TN Rachel Redmond Updated by Rachel Redmond	Multidisciplinary Planning and Environmental Consultants

1.12 Non-Technical Summary

A Non-Technical Summary of the EIAR has also been prepared. The EIA Directive states that one of the objectives of the EIA process is to ensure that the public are fully aware of the environmental implications of any decisions. EPA Guidelines note that the non-technical summary of the EIAR should facilitate the dissemination of the information contained in the EIAR and that the core objective is to ensure that the public is made as fully aware as possible of the likely environmental impacts of projects prior to a decision being made by Cork County Council. A Non-Technical Summary of the EIAR has therefore been prepared which summarises the key environmental impacts and is provided as a separately bound document.

1.13 Links between EIAR and Appropriate Assessment

A Screening Report for Appropriate Assessment (AA) has been carried out for the Proposed Development to determine if there is a risk of effects to any Natura 2000 site. As the AA screening screened out potential impacts on any Natura 2000 sites, a Natura Impact Statement (NIS) has been submitted with the application. While AA is required by the proposer of any plan or project likely to have an adverse effect on a Natura 2000 site, EIA is required for projects listed in Annex I of the EIA Directive. The requirement for EIA relative to projects listed in Annex II of the EIA Directive is determined on a case by case. While these two different types of assessment are independent and are required by separate legislation, namely the Birds and Habitat Directives (i.e. AA) and the EIA Directive (i.e. EIAR) there is a degree of overlap, particularly in the biodiversity chapter of the EIAR.

1.14 Availability of EIAR Documents

A copy of this EIAR document and Non-Technical Summary can be available to view or for purchase from Cork County Council Planning office at a fee not exceeding the reasonable cost of reproducing the document.

1.15 Statement of Difficulties Encountered

No exceptional difficulties were experienced in compiling the necessary information for the Proposed Development. Where any specific difficulties were encountered these are outlined in the relevant chapter of the EIAR.

1.16 Quotations

The application is also accompanied by a Non-Technical Summary of the EIAR, which is laid out in a similar, but condensed format to the main EIAR. The structure, presentation and the Non-Technical Summary of the EIAR, as well as the arrangements for public access, all facilitate the dissemination of the information contained in the EIAR. The core objective is to ensure that the public and local community are aware of the likely environmental impacts of the Proposed Development prior to the granting of consent.

However, it is important to acknowledge that the EIAR by its nature contains statements about the Proposed Development, some of which are positive and some less than positive. Selective quotation or quotations out of context can give a misleading impression of the findings of the study.

The EIA Regulations require that difficulties such as technical deficiencies, lack of information or knowledge encountered in compiling any specified information for the EIAR be described.

2 SITE DESCRIPTION

2.1 Introduction

This chapter sets out the context in which the site is located and outlines the baseline conditions and contextual factors that influence the potential effects of the Proposed Development.

This chapter was originally prepared by Enviroguide Consulting. Following the integration of Enviroguide into DNV, updates and supplementary information in response to the request for further information from Cork County Council are provided by DNV.

2.2 Quality Assurance and Competency of Experts

This chapter was prepared by Lakshmi Priya Mohan, Environmental Consultant with Enviroguide Consulting (now DNV). Lakshmi has a Master of Science in Environmental Science degree from University College Dublin, Master of Science degree in Zoology from Ethiraj College for Women, India, and Bachelor of Science in Zoology from Madras Christian College India. Lakshmi has worked as an Environmental Consultant with Enviroguide since 2023 and is now a part of the DNV team. Lakshmi has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Effects Interactions and Mitigation and Monitoring chapters of the EIARs.

This chapter has been reviewed and updated by Rachel Redmond, Environmental Consultant with Enviroguide (now DNV). Rachel has a Bachelor of Science (Hons) in Environmental Science from University College Cork. Rachel has worked as an Environmental Consultant with Enviroguide since 2023 and is now a part of the DNV team. Rachel has 4 years of experience as an environmental consultant preparing Environmental Impact Assessment Reports.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at Enviroguide (now DNV). Catherine is an environmental consultant with 37 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

2.3 Site Context

The site is located in the townland of Knockcahill as well as Rathcool, Co. Cork and sits approximately 1.5km northwest of Rathcool village. The site includes the existing aerodrome facility used by the Rathcool Flying Club and the HSE Air Ambulance service. The site contains three warehouse hangers, two of which belong to the Rathcool Flying Club and one to the HSE Air Ambulance. There is a clubhouse on the site which is used by the Rathcool Flying Club. Additionally on the site is a paramedic prefabricated base, crew prefabricated bases and a helipad which are used by the HSE Air Ambulance Service. Designated parking for Air Ambulance employees is provided adjacent to the paramedic prefabricated base. There is a

grass runway which is used by The Rathcool Flying Club and the Air Ambulance all year round, including in wet weather. The remainder of the site is made up of grassland.

The site is situated within a predominantly agricultural setting, with farmland extending in all directions. It is bounded by the River Blackwater to the north, woodland to the south-west, the L-5215 local road to the south, the L-1117 local road to the east, and open greenfields to the west. There are three access points to the site. The primary access point is at the southeastern corner of the site and is used by members of the Rathcool Flying Club. There is a separate access point further west which is designated for members of the Air Ambulance Service and the most southerly access point is used as an emergency exit. These access points adjoin the L-5215 road. The R583 is the nearest regional road and N72 is the nearest National Road to the site. The L1117 Local Road runs north-south from the R583 (south of the N72) to Rathcool Town. The N72 runs east-west from Mallow to Killarney.

The existing runway, licensed by the Irish Aviation Authority, is actively used by both the Rathcool Flying Club and the HSE Air Ambulance Service.

The current recorded movements at the Proposed Development have averaged approximately 2500 movements per annum over the past 3 years.

The five planes (light aircraft) in the club's ownership are:

- two Cessna 172 Aircraft and
- two kit-built aircraft (A Vans RV7) and
- a Samba aircraft.

The planes are normally stored in the on-site hanger unless they are off site for servicing.

The site does not comprise any protected areas. There are four European Sites within 15km of the study area. Blackwater River (Cork/Waterford) SAC is located directly adjacent to the site. A review of nationally designated sites indicates that there are two sites designated for nature conservation within 10km of the site: Boggeragh Mountains NHA and Banteer Ponds pNHA. Refer to Chapter 5 Biodiversity for further information.

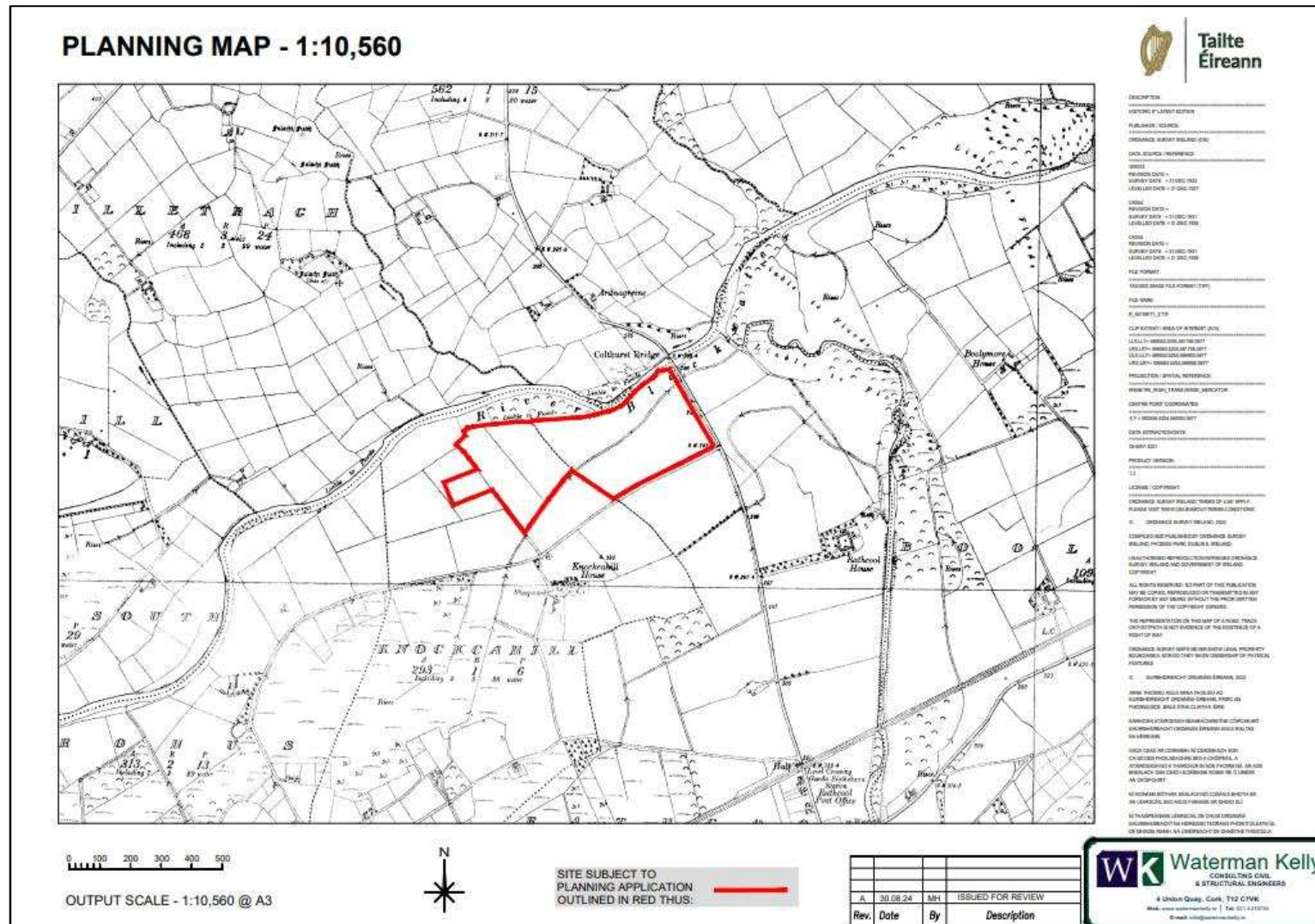


Figure 2-1: Site Location

2.4 Site Background and Site History

The site is subject to the Cork County Development Plan 2022-2028 (CCDP). The site is located within the North Cork Strategic Planning Area and is not zoned for a specific use. CCDP Objective CS 2-5 relates to the North Cork Strategic Planning Area and it notes that there is a need to diversify the rural economy by promoting a stronger tourism and leisure economy:

“Recognise the need to encourage the diversification of the rural economy by promoting a stronger tourism and leisure economy through the protection of the area’s natural and built heritage, and by encouraging appropriate new forms of employment development.”

Direct reference is made to the Rathcoole Aerodrome in Section 2.2.10 of the CCDP. It highlights the significance of the Aerodrome as a commercial asset in North Cork:

“The Rathcoole Aerodrome, licensed since 1962 by the Irish Aviation Authority, represents a unique and important commercial asset in North Cork. HSE Air Ambulance provide a dedicated Helicopter Emergency Service from the Aerodrome and favourable consideration will be given to appropriate proposals which seek to sustain its current and expand future functions subject to all relevant / normal planning considerations and taking account of its sensitive location relative to the Blackwater River.”

Table 1-1: Site Use History

Planning File Reference	Decision and Date	Development Description
22/6397	Refused 22/01/2024	Construction of a hard surfaced runway, taxiway and helipad with associated ground level lighting, associated interceptors along with relocation of existing hanger, paramedic prefab base, crew prefab base all associated with the Irish Community Air Ambulance, all of which to be serviced by a new proprietary waste water treatment, new vehicle entrance and associated site works. A Natura Impact Statement will be submitted to the Planning Authority with the application.
15/5370	Conditional 12/11/2015	Construction of 1 no. building to include (a) conference / training room / CCTV equipment area and meteorological briefing area, (b) customs and Irish Aviation Authority records office, (c) first aid equipment room, and (d) sanitary accommodation and installation of septic tank / percolation area and water well and all associated site works
84/1333	Grant Permission 1984	Construction of an aircraft hangar approximately 48 feet wide and 40 feet long.

Planning File Reference	Decision and Date	Development Description
70/1664	Grant Permission 1970	Construction of an aircraft hangar approximately 80 feet long and 43 feet wide.

Planning references 70/1664 and 84/1333 relate to historic applications associated with the site. Due to the date of these applications, details are not available on current online planning databases.

2.5 Cumulative Schemes

Cumulative effects are considered in this EIAR in line with Section 3.7.3 of the EPA Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022). It is acknowledged that while a single activity may itself result in a minor effect, it may, when combined with other impacts, minor or significant, result in a cumulative impact that is collectively significant. Similarly, a single activity which may on its own have a significant effect, may be reduced to an insignificant effect when combined with other 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. It can also be prudent to have regard to the likely future environmental loadings arising from the development of zoned lands in the immediate environs of the proposed project.” (EPA, 2022)

The following selection criteria has been applied for identifying schemes with the potential to cause likely cumulative effects.

- Existing or approved projects (by time of planning submission).
 - Existing refers to projects that have been granted planning permission and are being constructed.
 - Approved refers to projects that have been granted planning permission but not yet built.
 - Also included within the ‘existing and approved’ criteria are projects that have been applied for but are not yet consented (adopting a more precautionary “reasonably foreseeable” approach).
- Projects that are EIAR developments or projects that exceed the following thresholds:
 - residential projects over 150 residential units
 - non-residential commercial projects over 10,000 square metres of floor space.

- Infrastructure developments (roads, flood defences) over 1km distance.
- Projects (that meet B criteria) within a 2 km radius from the site.

Following a comprehensive review of the Proposed Development site and its surrounding area within 1km radius, it has been determined that once mitigation is applied, there are no significant cumulative impacts associated with the Proposed Development at the Rathcool Flying Club on the surrounding area.

Given the rural nature of the site and the absence of other developments, it is concluded that the cumulative impact of the Proposed Development is negligible.

3 DESCRIPTION OF THE PROPOSED DEVELOPMENT

3.1 Introduction and Terms of Reference

This chapter provides a description of the Proposed Development together with details of the existing environment. In accordance with Article 5(1)(a) of the EIA Directive, the description of the project should comprise:

‘...information on the site, design, size and other relevant features of the project’.

The EIAR must contain information in relation to the environmental impact of both the Proposed Development and all other reasonable alternatives studied. An indication of the main reasons for the option chosen must be given, taking into account the effects of the Proposed Development on the environment.

This EIAR was originally prepared by Enviroguide Consulting. Following the integration of Enviroguide into DNV, updates and supplementary information in response to the request for further information from Cork County Council are now provided by DNV.

3.1.1 Quality Assurance and Competence

This chapter was prepared and updated by Lakshmi Priya Mohan, Environmental Consultant with Enviroguide Consulting (now DNV). Lakshmi has a Master of Science in Environmental Science degree from University College Dublin, Master of Science degree in Zoology from Ethiraj College for Women, India, and Bachelor of Science in Zoology from Madras Christian College India. Lakshmi has worked as an Environmental Consultant with Enviroguide since 2023 and is now a part of the DNV team. Lakshmi has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Effects Interactions and Mitigation and Monitoring chapters of the EIARs.

This chapter has been reviewed and updated by Rachel Redmond, Environmental Consultant with Enviroguide (now DNV). Rachel has a Bachelor of Science (Hons) in Environmental Science from University College Cork. Rachel has worked as an Environmental Consultant with Enviroguide since 2023 and is now a part of the DNV team. Rachel has 4 years of experience as an environmental consultant preparing Environmental Impact Assessment Reports.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at Enviroguide (now DNV). Catherine is an environmental consultant with 37 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

3.2 Description of the Proposed Development

The construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing operations building and paramedic base building to the east of the site, and construction of a new operations and paramedic base building to the west of the site; and the demolition of an existing helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary waste water treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, the upgrade of an existing entrance onto the L-5215-0 road, site landscaping and all other associated site development works. An Environmental Impact Assessment Report (EIAR) has been prepared and will be submitted to the Planning Authority with the application. The EIAR will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy during office hours at the offices of the Planning Authority. A Natura Impact Statement will be submitted to the planning authority with the application. The Natura Impact Statement will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy during office hours at the offices of the Planning Authority.

An application for a similar development was lodged in 2022 and refused by Cork County Council due to concerns related to flooding, proximity of the site to the Blackwater SAC and discrepancies and conflicting information contained within the application documentation, including the Environmental Impact Assessment Report (application reference 22/6397).

The revised application will review all of the background information and address the concerns raised in the Council's decision for the previous application.

Figure 3-1 details the proposed site layout.



3.2.1 Construction Phase

It is estimated that the construction phase of the Proposed Development will be approximately 4 months from initial commencement on-site. It is intended that the works be constructed in 1 phase.

For the duration of the construction phase, it is envisaged that the maximum working hours will be 07:00 to 18:00 Monday to Friday (excluding bank holidays) and 08:00 to 14:00 Saturdays. Where works are required outside of these hours, permission will be sought from the local authority (Cork County Council).

It is estimated that 12,210 tonnes of material will need to be removed from the site. The excavated material will be stockpiled in a designated area of the site where it will be allowed to dry ahead of removal from the site. All topsoil is to be removed from the site.

The machinery and plant predicted to be onsite during the construction phase include:

- 2 No. 22 tonne excavators
- 2 No dozers
- 1 No. single drum compactor
- 1 No. motor grader
- 3 No. 150 horsepower tractors
- 2 No. 14 tonne trailers
- 1 No. paver / feeder
- 1 No. tanker with splash plate

3.2.1.1 Construction Traffic

Access control to the site will be maintained at all times by the appointed main contractor, who will be responsible for traffic management on site (refer to figure 3-2). Construction access will be via the existing public road, Local Road L-5215-0. A Traffic Management Plan will be prepared before construction for all personnel which all personnel onsite will be made aware of. The parking of contractor's vehicles will be set out on site, ensuring traffic does not cause any unnecessary congestion and potential traffic hazards along the public road.

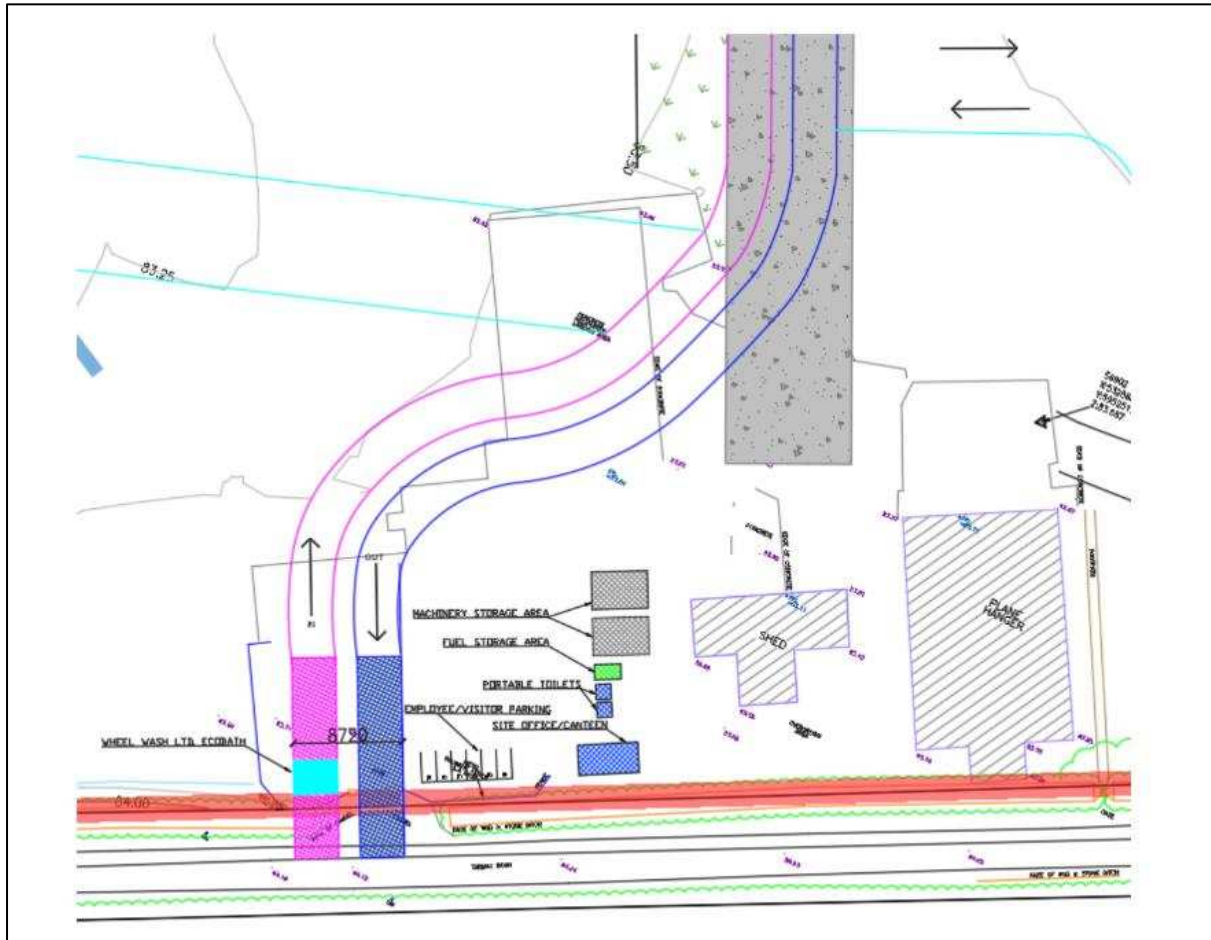
All trucks must enter the site, no parking along the public road will be permitted. Delivery of materials to site will be timed separately. It is envisaged that there will be no interruption to main traffic on this route. In the event of abnormal loads being delivered to site, the appointed main contractor will ensure that there will be a banksman present on the public road to instruct vehicles on where they are to go.

Relevant warning signs as per traffic management plan will be erected at 25m and 50m distances of each side of all approaches to the site entrance to advise the public and motorists of construction activities.

The proposed site compound will consist of:

- Machinery storage area
- Fuel storage area
- Portable toilets
- Employee/visitor parking
- Site office/canteen

- Figure 3-2 shows the site compound and entrance.



3.2.2 Operational Phase

The current recorded movements at the Proposed Development have averaged approximately 2500 movements per annum over the past 3 years. It is expected that the use of the Proposed Development by Rathcool Flying Club will increase by approximately 1,940 flight movements per annum by 2029, the use by the air ambulance service is projected to remain broadly in line with current patterns. The club will continue to operate for the purpose of aviation leisure and recreation.

A feedback mechanism has been considered in response to the RFI. It is proposed to keep a complaints log at the site should there be any complaints received. A phone number or email address will be made available for communicating the complaints, or a member of staff will be on the site at all times.

3.3 Description of Alternatives

3.3.1 Introduction

The RFI received from Cork County Council on the 22nd May 2025 requested further information regarding alternatives.

In response to the RFI this section has been reviewed and revised to provide a comprehensive consideration of reasonable alternatives in accordance with the Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) and Article 5 of the EIA Directive.

The RFI states –

“The EPA Guidelines (EPA, 2022) states: “The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with ‘an indication of the main reasons for selecting the chosen option’. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option”

The EIAR Submitted states:

- *No alternative sites have been considered*
- *Considering the support for the Rathcoole Aerodrome in the Cork County Development Plan 2022 – 2028 other land uses on site is not considered necessary to consider alternative uses for the proposed development*
- *An alternative design for this project was not feasible and none is presented*
- *No specific alternative construction processes were identified*
- *Alternative processes were not considered*

It is therefore evident that no alternatives have been proposed or assessed. This is not in accordance with the EPA guidelines and does not provide a range of the practicable alternatives. You are requested to revise Chapter 3: Description of Alternatives and to provide a comprehensive consideration of reasonable alternatives”

Consideration of reasonable alternatives is an important aspect of the EIA process and is necessary to evaluate the likely environmental consequences of a range of development strategies for the site within the constraints imposed by environmental and planning conditions. This section provides a description of the reasonable alternatives that have been considered.

Article 5 of the EIA Directive requires that that the EIAR contain:

“A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, 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.”

This section of the EIAR provides an explanation of the reasonable alternatives examined throughout the design and consultation process. This serves to indicate the main reasons for choosing the Proposed Development, taking into account and providing a comparison of the environmental effects. The alternatives may be described at four levels:

- Alternative locations;
- Alternative designs;
- Alternative layouts; and
- Alternative processes.

Pursuant to Section 3.4.1 of the Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022), the consideration of alternatives also needs to be cognisant of the fact that *“in some instances some of the alternatives described below will not be applicable - e.g. there may be no relevant ‘alternative location’...”*

In accordance with EPA Guidelines (EPA, 2022), different types of alternatives may be considered at several key phases during the process. As environmental issues emerge during the preparation of the EIAR, alternative designs may need to be considered early on in the process or alternative mitigation options may need to be considered towards the end of the process.

The EPA Guidelines (EPA, 2022) states:

“The objective is for the developer to present a representative range of the practicable alternatives considered. The alternatives should be described with ‘an indication of the main reasons for selecting the chosen option’. It is generally sufficient to provide a broad description of each main alternative and the key issues associated with each, showing how environmental considerations were taken into account in deciding on the selected option. A detailed assessment (or ‘mini-EIA’) of each alternative is not required.”

The following sections of this chapter of the EIAR contains an analysis of the alternative development options for the site, describing design options and changes which were incorporated into the scheme as the proposals progressed. The key considerations and amendments to the design of the scheme, having regard to and comparing the key environmental effects, are set out and discussed.

3.3.1.1 Alternative Locations

The Proposed Development is located within the applicant’s ownership and forms part of the existing Rathcoole Aerodrome. The Proposed Development is considered to be upgrade works to the existing operations.

Given the established use of the site as an operational aerodrome and its strategic importance for emergency medical services and recreational aviation, the development is inherently tied to the existing aerodrome, and relocating the proposed infrastructure would not be feasible or reasonable.

In accordance with Section 3.4.1 of the EPA Guidelines (2022), it is recognised that:

“In some instances some of the alternatives described below will not be applicable – e.g. there may be no relevant ‘alternative location’...”

In this context, the location is not only appropriate but essential to the function and purpose of the Proposed Development. As such, the consideration of alternative sites is not applicable.

3.3.1.2 Alternative Uses

The site currently operates as an established aerodrome, hosting both Rathcool Flying Club and the HSE Air Ambulance service. Given this existing use and the strategic importance of the aerodrome for emergency medical response and recreational aviation, alternative land uses were not considered viable or reasonable.

The Cork County Development Plan 2022 –2028 explicitly supports the continued and expanded use of Rathcoole Aerodrome, recognising it as a unique and important commercial asset in North Cork. Introducing alternative uses such as agricultural, residential, or commercial development would conflict with this policy support and compromise the operational integrity of the aerodrome.

The Proposed Development aligns with the current and future intended use of the site, and no reasonable alternative land use was identified that would better serve the public interest or environmental objectives.

Nonetheless, in response to the RFI and in accordance with EPA guidance a range of potential alternative uses were reviewed including agricultural use, residential development, commercial or industrial activities, recreational or tourism facilities, conservation or amenity use, renewable energy installations, and mixed-use schemes. Each of these alternatives were deemed unsuitable due to planning policy constraints, operational incompatibility with aviation, and the potential for increased environmental or community effects. For example, residential or commercial development would conflict with aviation safety zones and introduce noise sensitivity issues, while renewable energy infrastructure would interfere with flight paths.

3.3.1.3 Alternative Design and Layouts

The design of the Proposed Development was informed by a combination of aviation safety requirements, environmental constraints, and operational efficiency. As part of the early planning and design process, several alternative configurations were considered to ensure the most appropriate and sustainable outcome for the site. Design variations explored included:

- Runway orientation
- Placement of hangars and helipad
- Location of prefabricated bases

These alternatives were assessed in relation to prevailing wind direction, topography, proximity to residential receptors, and approach/departure paths for aircraft. The selected design aligns with the south-westerly prevailing wind, which is optimal for safe aircraft operations, and provides increased separation from residential properties approximately 770m from the southern boundary thereby reducing potential noise and visual impacts.

The design also incorporated sustainable technologies where feasible, including

- Low-impact LED lighting for the runway and taxiway, and,
- Consideration of permeable surfacing to improve drainage and reduce runoff.

While some alternative designs and layouts were not viable due to site-specific constraints, the final design represents the most efficient and environmentally sensitive configuration for

the site. It maximises the development potential of a strategically positioned plot while ensuring compliance with aviation safety standards and minimising environmental impact.

In this context, the selected layout is considered the most reasonable and practicable option.

3.3.1.4 Alternative Process

The construction and operational processes associated with the Proposed Development were reviewed to identify any reasonable alternatives that could reduce environmental impact, improve efficiency, or enhance safety.

While no radically different construction techniques were deemed necessary, several process-related options were considered. These included:

- Modular construction methods for the prefabricated bases, which could reduce on-site activity and associated emissions, and
- The use of low-carbon materials and recycled aggregates for surfacing works.

Due to site-specific logistical constraints and the need for durable aviation infrastructure, conventional construction methods were selected as the most appropriate. These methods ensure compliance with aviation standards and long-term performance requirements.

During the operational phase, the aerodrome will continue to function under existing aviation protocols, with no new or technically complex procedures introduced. Alternative operational processes, such as automated lighting systems or remote monitoring of aircraft movements, were considered and introduced into the Proposed Development. The selected processes reflect industry best practice and are consistent with the operational requirements of both Rathcool Flying Club and the HSE Air Ambulance service.

The final approach represents a balance between practicality, safety, and environmental responsibility.

3.4 The Existence of the Project

The potential for any likely significant environmental impacts of the Proposed Development is fully addressed in the relevant specialist chapters of this EIAR. These topics include: Population and Human Health, Land and Soil, Hydrology and Hydrogeology, Landscape and Visual, Noise and Vibration, Air Quality and Climate, Archaeology and Cultural Heritage, Traffic, and Waste Management.

During the operational phase, the newly constructed runway, taxiway, and helipad will be fully operational, thereby enhancing the infrastructure for the air ambulance service. The relocated hangar and prefabricated bases will support the operational requirements of paramedic and crew services.

Following a comprehensive review of the Proposed Development site and its surrounding area within 1km radius, it has been determined that once mitigation is applied, there are no significant cumulative impacts associated with the Proposed Development at the Rathcool Flying Club on the surrounding area.

Given the rural nature of the site and the absence of other developments, it is concluded that the cumulative impact of the Proposed Development is negligible.

Each of the technical EIAR chapters considers these impacts in their assessment and proposes appropriate mitigation measures.

4 POPULATION AND HUMAN HEALTH

4.1 Introduction

This chapter considers the potential effects of the Proposed Development on human beings, living, working and visiting in the vicinity of the site. The chapter details the potential direct and indirect effects of the Proposed Development on the local population and human health.

The section on Population and Human Health is broad ranging and covers the existence, wellbeing, and activities of people through the format of considering people as 'groups' or 'populations'. The assessment of impacts on human beings involves the identification of relevant key populations that may be affected by the proposal and quantifiable documentary research. Health, as defined by the World Health Organization (WHO), is *"a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity"*.

Key populations have been identified as persons residing and engaging in activities near the site, persons with a stake in the general economy of the local and regional area, and persons enjoying the recreational and cultural amenities of the area.

This chapter has been reviewed and revised in response to Cork County Council's Request for Further Information (Ref: 25/04538), specifically to address the projected increase in flight movements by Rathcool Flying Club and its potential implications for population and human health.

4.1.1 Quality Assurance and Competence

This chapter was prepared and updated by Rachel Redmond, Environmental Consultant, with Enviroguide. Rachel has a BSc (Hons) in Environmental Science from University College Cork. Rachel has 4 years professional experience as an Environmental Consultant, preparing EIA Screening Reports and a range of chapters for EIARs of a similar scale and nature to the Proposed Development.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at Enviroguide. Catherine is an environmental consultant with 20 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

4.2 Study Methodology

A desk-based study was undertaken in September 2024 to assess the information regarding population, age structure, economic activity, employment and unemployment within the vicinity of the Proposed Development. This study was undertaken in accordance with the following guidance:

- Guidelines on the information to be contained in Environmental Impact Assessment Reports, EPA (2022);
- EIA Guide to Effective Scoping of Human Health, IEMA (2022);
- EIA Guide to Determining Significance for Human Health, IEMA (2022); and,
- Institute of Public Health (IPH) (2021) Health Impact Assessment Guidance.

The 2022 Census of Ireland was held on Sunday the 3rd of April 2022. The preliminary results were released on the 23rd of June 2022 with the remaining results being published over several months starting in April 2023.

The scope of this evaluation is based on a review of data available from the Central Statistics Office (CSO), legislation, guidance documents and EIARs. The aim of the study was to assess the current baseline environment.

The potential effects of the Proposed Development on the local population is assessed in this EIAR in relation to:

- Population demographics;
- Socio economic impacts;
- Water quality;
- Air quality;
- Noise and vibration;
- Traffic and transport; and,
- General amenity and tourism.

In accordance with the IPH guidance, sensitivity of the local population was determined following the methodology set out in Part 4 and as summarised in the Health Sensitivity: Conceptual Model presented in Figure 4-1 below.

The sensitivity of the population was considered taking into account the following indicative criteria as included in the IEMA guidance:

- Deprivation;
- Resource sharing;
- Inequalities;
- Community outlook;
- Daily activities;
- Dependencies;
- Health status; and
- Adaptability.

In addition, the health magnitude of effects was considered, taking into account the indicative criteria set out in the IEMA guidance:

- Scale;
- Duration;
- Frequency;
- Severity;
- Extent;
- Reversibility of the effect; and

- Health services quality implication.

4.2.1 Study Area

No formal national guidance is available on the appropriate study area to focus the assessment of population and human health. As such, professional judgement has been applied in determining the appropriate study areas. Due to the wide reaching and often transient nature of people, the potential effects of the Proposed Development can be experienced at different scales. For example, the impact of air quality on human health will be experienced at a much smaller radius when compared to socio-economic impact which can be experienced at a community or regional level.

When choosing an appropriate study area for the potential effects on population and human health in this chapter, the extent of the area assessed varies. In order to assess baseline population and human health conditions in the wider area, Electoral Divisions (EDs) have been considered.

When assessing the socio-economic and population demographic effects, the study area consisting of the Rathcool ED has been assessed. For all other effects, specific sensitive receptors have been identified.

4.2.2 Information Sources

The principal sources of information are as follows:

- Census and employment information published by the Central Statistics Office (CSO);
- Cork County Development Plan 2022 – 2028; and
- Ordinance Survey Ireland (OSI) mapping and aerial photography.

The Institute of Public Health in Ireland has issued a document “Health Impact Assessment Guidance” (2021) which details the link between human health and the built environment (Figure 4-2). This document also details the negative health impacts associated with unemployment. Unemployment affects both physical and mental health and is an important determinant of health inequalities in adults of working age. Unemployed people have a higher risk of lower levels of psychological wellbeing ranging from symptoms of depression and anxiety to self-harm and suicide. Unemployment can also impact other health determinants for example housing and nutrition. Based on this information, employment generated as a result of the Proposed Development has been assessed throughout this chapter.

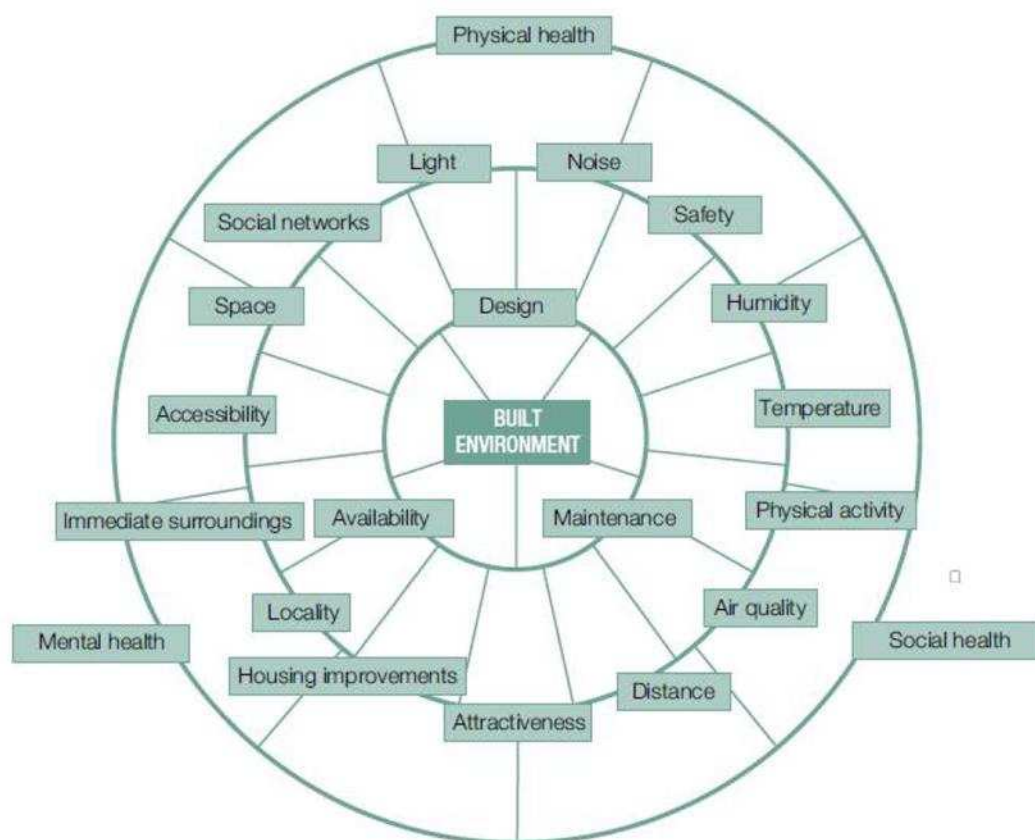


Figure 4-1: Health Impact of the Built Environment (source: Institute of Public Health in Ireland)

The European Commission (EC) has published the “Guidance on The Preparation of The Environmental Impact Assessment Report” (EC, 2017). This document defines human health as “a very broad factor that would be highly Project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air”.

Technical chapters within the EIAR have also been reviewed when assessing the likely effects on population and human health. These include the relevant chapters relating to air quality, noise and vibration, hydrology, traffic and transport and landscape and visual.

In line with the Environmental Protection Agency (EPA) Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022) (the EPA Guidelines (EPA, 2022)), the terms defined when quantifying the quality of effects, as outlined in Chapter 1.

4.3 The Existing and Receiving Environment (Baseline Situation)

4.3.1 Population and Demographic Analysis

The most recent population figures published by the Central Statistics Office (CSO) indicate that the combination of a net inward migration and high birth rates have resulted in the

population of Ireland has exceeded five million for the first time since 1851. Population projections for Ireland up to 2046 anticipate a population of approximately five million under the most pessimistic scenario and over 6.7 million under the most optimistic scenario.

4.3.2 Population and Age

A breakdown of the age groups in the study area, County Cork and the State (Ireland) are presented in Table 4-1. This table is further broken down into percentages of the population within these age ranges. No age category in the study area deviates from the average figures in County Cork or the State by more or less than 5%. The number of adults aged 5-24 years in the study area is slightly higher than the figures for County Cork and the State.

There number of people in the study area aged 25-34 (10.3%) is slightly lower than County Cork (13.6%) and the State (12.2%).

People aged 35-44 (14.2%), 45-54 (15.6) and 55-64 (11.2%) in the study area are in line with those for County Cork and the State and vary by a maximum of +/-3%.

The study area and County Cork have a slightly lower percentage of people aged 65 – 74 when compared with the State but have higher percentage of people aged 75 years and older when compared with the State.

Table 4-1: Age Groups in the Study Area, County Cork and the State

Age Range	Study area		County Cork		State	
	No. of People	% of People	No. of People	% of People	No. of People	% of People
0-4 years	32	5.7	33,062	5.7	295,415	5.7
5-24 years	160	28.4	148,184	25.4	1,361,643	26.4
25-34 years	58	10.3	79,382	13.6	628,031	12.2
35-44 years	80	14.2	89,265	15.3	794,393	15.4
45-54 years	88	15.6	74,617	12.8	713,507	13.9
55-64 years	63	11.2	70,185	12.0	579,835	11.3
65-74 years	42	7.5	50,431	7.5	441,028	8.6
75 years and over	40	7.1	33,030	7.1	335,287	6.5
Total	563		584,156		5,149,139	

4.3.3 Economic Activity and Employment

The labour force is defined as the number of people above the legal working age that are available to work. Table 4-2 shows the percentage of the population who were in the labour force during the 2022 census.

The number of people at work in the study area (58.6%) is slightly more than in County Cork (56.2%) and the State (56.09%).

The number of people who are retired in the study area (14%) is slightly lower than in County Cork (15.69%) and slightly lower than the figure for the State (15.90%).

Table 4-2: Principal Economic Status

Principle Economic Status	No. of people study area	Percent (%)	No. of people County Cork	Percent (%)	No. of people State	Percent (%)
At work	268	58.60	264,423	56.20	2,320,297	56.09
Looking for first regular job	2	0.44	3,238	0.69	34,526	0.83
Short term unemployed	4	0.88	6,567	1.40	70,217	1.70
Long term unemployed	9	2.0	9,638	2.05	106,059	2.56
Student	55	12.0	54,387	11.56	459,275	11.10
Looking after home/family	39	8.5	32,425	6.89	272,318	6.58
Retired	64	14.0	73,811	15.69	657,790	15.90
Unable to work due to permanent sickness or disability	14	3.1	22,874	4.86	189,308	4.58
Other	2	0.44	3,126	0.66	27,062	0.65
Total	457		470,489		4,136,852	

The closest social welfare office to the Proposed Development is the Newmarket Branch Office which covers the following areas: Banteer, Ballydesmond, Boherbue, Castlemagner, Cecilstown, Clonbanin, Cullen, Dernagree, Dromagh, Dromcollogher (parts of), Freemount, Kanturk, Kilbrin, Kilcorney, Kiskeam, Knocknagree, Lismire, Lombardstown (parts of), Lyre, Meelin, Millstreet, Nad, Newmarket, Rathcool, Rathmore-Co Cork and Rockchapel.

Table 4-3 shows the industries the people in the study area work in when compared with the figures for County Cork and the State of Ireland. The top three groups which account for 60.08% of the study area in total are:

- Commerce and trade;
- Professional services; and
- Manufacturing industries.

Table 4-3 Industry in which People Work in the Study Area, County Cork and the State

Industry	No. of people study area	Percent (%)	No. of people County Cork	Percent (%)	No. of people State	Percent (%)
Commerce and trade	40	14.93	57,401	21.71	552,642	23.82

Industry	No. of people study area	Percent (%)	No. of people County Cork	Percent (%)	No. of people State	Percent (%)
Professional services	64	23.88	64,710	24.47	568,105	24.48
Manufacturing industries	57	21.27	46,395	17.55	273,102	11.77
Other	32	11.94	37,384	14.14	365,716	15.76
Transport and communications	17	6.34	20,125	7.61	212,383	9.15
Public administration	13	4.85	12,535	4.74	131,639	5.67
Building and construction	17	6.34	15,012	5.68	134,482	5.80
Agriculture, forestry and fishing	28	10.45	10,861	4.11	82,228	3.54
Total	268		264,423		2,320,297	

In relation to education, the highest level of education in the study area is broadly similar to the levels in County Cork and the State. The top three levels of education completed in the study area includes:

- Lower secondary;
- Upper secondary; and
- Honours bachelor's degree, professional qualification or both.

Table 4-4: Highest Level of Education Completed in the Study Area, County Cork and the State

Highest Level of Education Completed	No. of people study area	Percent (%)	No. of people County Cork	Percent (%)	No. of people State	Percent (%)
Upper Secondary	80	20.89	69,294	17.98	613,478	18.13
Honours Bachelor's Degree, Professional Qualification or both	41	10.70	53,233	13.81	450,523	13.31
Postgraduate Diploma or Degree	33	8.62	43,683	11.33	446,007	13.18
Lower Secondary	57	14.88	51,821	13.44	379,416	11.21
Ordinary Bachelor's Degree or National Diploma	21	5.48	32,423	8.41	272,535	8.05
Technical or Vocational Qualification	30	7.83	30,021	7.79	253,892	7.50
Higher Certificate	30	7.83	21,805	5.66	251,219	7.42
Advanced Certificate/Completed Apprenticeship	31	8.09	23,766	6.17	220,311	6.51
Primary Education	36	9.40	25,034	6.49	190,268	5.62

Highest Level of Education Completed	No. of people study area	Percent (%)	No. of people County Cork	Percent (%)	No. of people State	Percent (%)
Not Stated	18	4.70	21,535	5.59	187,488	5.54
No Formal Education	4	1.04	7,502	1.95	81,280	2.40
Doctorate (Ph.D.) or higher	2	0.52	5,342	1.39	38,212	1.13
Total	383		385,459		3,384,629	

4.3.4 Deprivation Indices

In addition, the Pobal HP Deprivation Indices was reviewed for the study area. The site is located within the Rathcool Electoral Area (Small Area ID: 047276001). The deprivation index and relevant information for both areas are included in Table 4-5 below.

Table 4-5: Pobal HP Deprivation Indices

Pobal Deprivation Indices	Small Area 047276001
Pobal HP Index 2022	1.21
Pobal HP Description 2022	Marginally Above Average
Population 2022	345
Age Dependency Ratio 2022	33.91%
Lone Parent Ratio 2022	3.23%
Proportion Primary Education Only 2022	12.55%
Proportion at Third Level Education 2022	32.03%
Unemployment Rate – Male	4.76%
Unemployment Rate - Female	4.23%

The study area is described as being ‘marginally above average’ deprivation levels.

4.3.5 Human Health

Health, as defined by the World Health Organization (WHO), is "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity". The Healthy Ireland Framework 2013-2025 defines health as ‘everyone achieving his or her potential to enjoy complete physical, mental and social wellbeing. Healthy people contribute to the health and quality of the society in which they live, work and play’. This framework also states that health is much more than an absence of disease or disability, and that individual health, and the health of a country affects the quality of everyone’s lived experience.

Health is an essential resource for everyday life, a public good and an asset for health and human development. A healthy population is a major asset for society and improving the health and wellbeing of the nation is a priority for Government. Healthy Ireland Framework

2013-2025 is a collective response to the challenges facing Ireland's future health and wellbeing.

Table 4-6 shows that 89.45% of people in Rathcool have self-identified themselves as having "very good" or "good" health.

Table 4-6 General Health of the Population in the Study Area, County Cork and the State

General Health	No. of people study area	Percent (%)	No. of people County Cork	Percent (%)	No. of people State	Percent (%)
Very Good	118	54.13	322,178	55.15	2,740,994	53.23
Good	77	35.32	171,974	29.44	1,527,027	29.66
Fair	18	8.26	47,929	8.20	444,895	8.64
Bad	2	0.92	7,436	1.27	72,556	1.41
Very Bad	0	0.00	1,784	0.31	16,843	0.33
Not Stated	3	1.38	32,855	5.62	346,824	6.74
Total	218		584,156		5,149,139	

4.3.6 Social Health

According to the World Health Organisation, poor social and economic circumstances affect health throughout life. Good health involves reducing levels of educational failure, reducing insecurity and unemployment, and improving housing standards. Health is influenced, either positively or negatively, by a variety of factors. Some of these factors are genetic or biological and are relatively fixed. 'Social determinants of health' arise from the social and economic conditions in which people live. They are not so fixed such as type of housing and environments, access to health or education services, incomes generated and the type of work people do, can all influence a person's health, and the lifestyle decisions people make.

A range of factors have been identified as social determinants of health. These can include the wider socio-economic context, inequality, poverty, social exclusion, socioeconomic position, income, public policies, health services, employment, education, housing, transport, the built environment, health behaviours or lifestyles, social and community support networks and stress.

People who are less well off or who belong to socially excluded groups tend to fare badly in relation to these social determinants. Being at work on the other hand provides not only an income, but also access to social networks, a sense of identity and opportunities for development or progression.

Figure 4-2 presents the social determinants of health adapted from Dalghren and Whitehead (1991) and Grant and Barton (2006) as presented in Healthy Ireland.

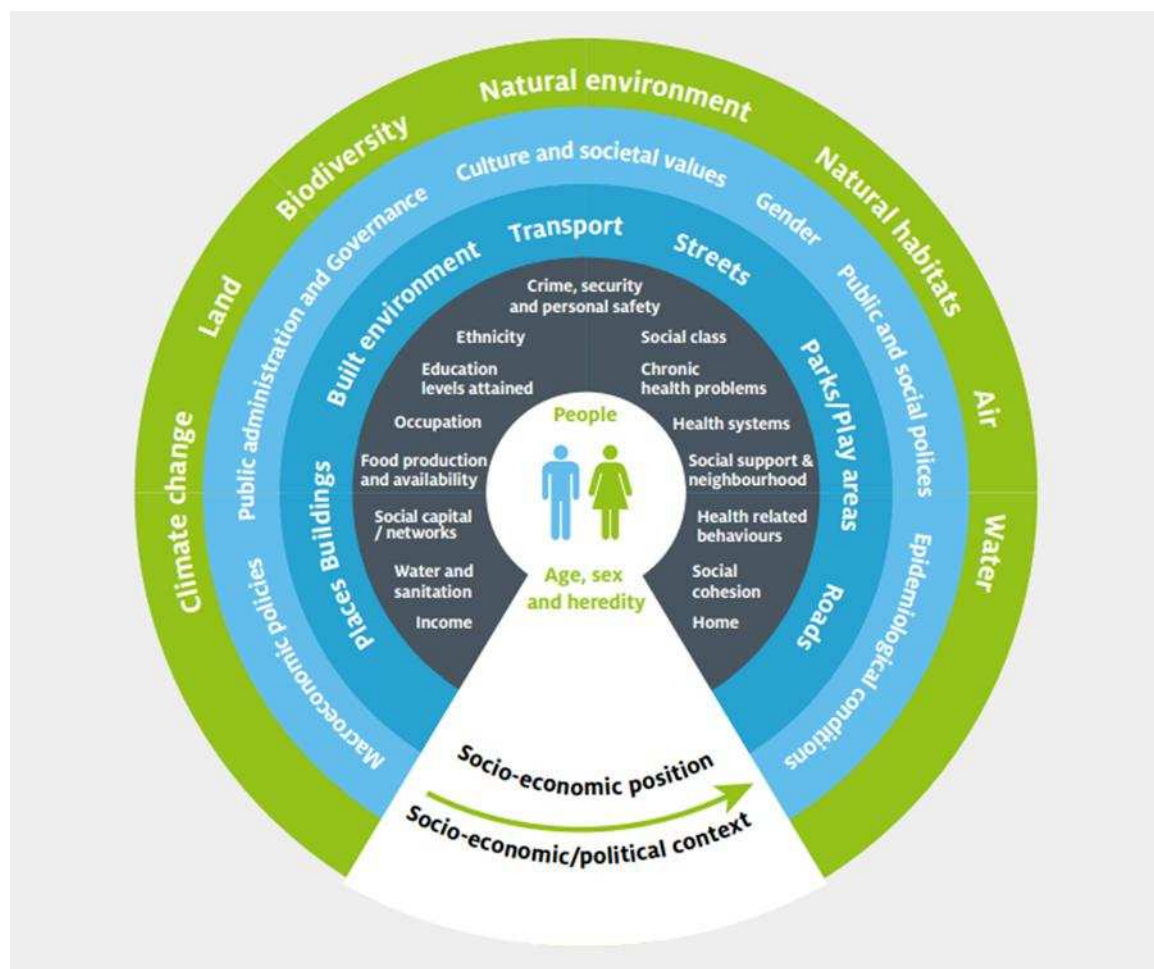


Figure 4-2: Social Determinants of Health

Section 4.3.3 of this chapter states that 58.6% of people in the study area are in the labour force. This reflects the high number of people of a working profile living within the area which is expected due to the percent of people of a working age living in the area.

The Proposed Development will allow for the creation of new employment. It is proposed that approximately 20 no. jobs will be created during the construction phase which will have a direct and indirect positive impact on the local economy and employment. There are no additional employees expected during the operational phase.

4.3.7 General Amenity and Tourism

Healthcare Facilities

The closest hospital to the site is the Kanturk Community Hospital, located approximately 9.12km northeast of the site. Dr Patrick Casey Medical Practice is located approximately 6.8km southwest of the site.

Education Facilities

The closest national school to the site is the Rathcool National School located approximately 1.54km south of the site. The closest secondary school to the site is the Millstreet Community School located approximately 7.35km southwest of the site.

Sports and Recreation

There are a limited number of sports and outdoor facilities located in the vicinity of the Proposed Development, however, Dromtariffe GAA Club is located approximately 908m south of the site.

Tourism and Heritage Sites

A review of tourism related sites and recreation activities did not identify any specific tourism attractions within 1km of the site. Drishane Castle is the nearest Architectural Conservation Area which is located approximately 5.5 km to the southwest.

The Blackwater Way (the combined Duhallow and Avondhu Ways) is a 168 km walking route that stretches from County Kerry across north County Cork and into County Waterford before joining with long distance E8 European Walking Route. The nearest section of the Blackwater Way lies approximately 8 km to the south.

4.3.8 Summary of Receptors and Sensitivity

The sensitivity of the local area and population as determined considering the above examination of the local area and population, and the IEMA Guide to Determining Significance for Human Health in Environmental Impact Assessment.

Table 4-7: Sensitivity Determination

Criteria	Classification	Category	Justification
Deprivation	Moderate	Medium	The deprivation index for the area is described as “marginally above average”.
Resource Sharing	Sufficient	Low	The Proposed Development currently shares resources with the local population.. The site is located in a rural area which has sufficient resources to cater for both the Proposed Development and the local area.
Inequalities	Narrow	Very Low	The local area has a majority of “very good” or “good” health (89.45%), which is fairly homogenous. In addition, the majority of the population is “at work” (58.6%), with only 2.88% of the population in the study area being unemployed.
Community Outlook	Ambivalent	Low	The site is located in a rural setting with few sensitive receptors in close proximity. It is expected that the local population would have a neutral outlook towards the Proposed Development.
Daily Activities	Slightly limited	Low	3.1% of the population identifies as being unable to work due to permanent sickness or disability.
Care Taking	Some care required	Low	With 3.1% of the population being unable to work due to permanent sickness or disability, it is expected that some care is required or being provided for within the study area.
Dependencies	Independent	Very Low	The age dependency ratio for the study area is 33.91%, which is lower than the national average of 53.2%.
Health Status	Very good	Very Low	The majority of the population (54.13%) identified as having “very good” health.

Criteria	Classification	Category	Justification
			35.32% of the population identified as having "good" health.
Adaptability	High capacity	Very Low	It is expected that the Proposed Development will not have an adverse effect on service quality for the resident population.
Overall Sensitivity		Very Low	

4.4 Characteristics of the Proposed Development

4.4.1 Construction Phase

It is anticipated that the construction phase of the Proposed Development will last approximately 4 months and will employ approximately 20 people during the construction period. It is considered that the Proposed Development will have a short-term positive effect on the population in terms of local job creation.

4.4.2 Operational Phase

The operational phase of the Proposed Development includes continued use of the aerodrome by Rathcool Flying Club and the HSE Air Ambulance. The flying club has been in operation since the 1960s and will continue to be business as usual. Currently there are 4 No. employees at the flying club which includes two pilots and one paramedic at any one time, and a person onsite for security reasons.

The use of the Aerodrome by the Rathcool Flying Club will increase approximately by 1,940 flight movement per annum by 2029, a 43% increase from current average levels, while use by the air ambulance is projected to remain broadly in line with current trends.

Aircraft types expected to use the upgraded runway include light recreational aircraft and training aircraft with the flying club predominantly being used by pilots who fly planes as a hobby. Currently, the site is often unusable during the winter as the grass runway can be wet and not suitable for landing planes. The upgrade will allow for pilots to utilise the runway throughout the year. These upgrades will also enable night-time operations for the air ambulance, improving emergency response capabilities.

The intensification of aircraft activity has been assessed in terms of potential impacts on population and human health, including noise exposure, air quality, and general amenity. These impacts are addressed in Chapters 8 and 9, with mitigation measures proposed where appropriate.

4.5 Potential Impact of the Proposed Development

4.5.1 Construction Phase

4.5.1.1 Population Demographics

The construction phase of the Proposed Development will include for the employment of approximately 20 No. people. This is considered to be a short-term and positive effect on the local area.

4.5.1.2 Socio-Economic

The construction phase of the Proposed Development includes for 20 No. employees. It is expected, due to the rural nature of the site it is expected that these employees will be local or from nearby towns in County Cork.

The Proposed Development will have an indirect and direct positive effect on the socio-economy of the local area.

4.5.1.3 Hydrology – Water Quality

Pollution within the drinking water well has potential to negatively effect the groundwater located onsite. Chapter 7 outlines mitigation measures and residual effects.

It is considered that the residual impacts on the onsite drinking well and human health are unlikely, negative, not significant, local and short term.

4.5.1.4 Air Quality and Climate

The construction phase of the Proposed Development has the potential to negatively effect the surrounding air quality and in turn the human health of the local population. This has been addressed within Chapter 8 Air Quality and Chapter 9 Climate and it is considered that the effects of Air Quality and Climate on the surrounding population and human health will be negative, not significant and short term in nature.

4.5.1.5 Noise and Vibrations

The construction phase of the Proposed Development has the potential to increase noise levels in the surrounding area and in turn the human health of the local population. this has been addressed within Chapter 9 Noise and Vibrations and it is considered that the effects of Noise and Vibrations on the surrounding population and human health will be negative, not significant and short term in nature.

4.5.1.6 Traffic and Transport

The construction phase of the Proposed Development has the potential to increase traffic levels in the surrounding area in particular with additional HGVs and construction traffic, and in turn effect the population and human health this has been addressed within Chapter 11 Traffic and Transport.

It is considered that the effects of Traffic and Transport on the surrounding population and human health will be not significant and short term in nature.

4.5.1.7 General Amenity and Tourism

The construction phase of the Proposed Development is not expected to have a significant effect on the general amenity and tourism in the area.

4.5.2 Operational Phase

The operational phase will see an increase of approximately 1,940 flight movements per annum by 2029, representing a 43% increase. Aircraft types include light recreational aircraft and training aircraft. These changes have been assessed in terms of noise, air quality, and human health impacts.

4.5.2.1 Population Demographics

There are currently 4 No. employees at the Proposed Development. It is not expected that the operational phase of the Proposed Development will require further employees. The sensitivity of the study area has been identified as very low. The magnitude of the impact is low.

Based on the mobile nature of employees and the baseline population assessment, the likely effect on population demographics as result of the Proposed Development will be direct, medium to long term and imperceptible.

4.5.2.2 Socio-Economic

The Rathcool Flying Club currently employs 4 No. employees and it is not expected that the operational phase of the Proposed Development will require any further employees.

The upgrade works will benefit the Rathcool Flying Club members by enabling year-round use of the aerodrome. Additionally, the air ambulance will gain improved access and enhance emergency response capabilities. The intensification of aircraft activity may introduce new pressures on local amenity and health, which have been assessed in relevant chapters. The sensitivity of the receptor in the study area has been identified as very low. The magnitude of the impact is low.

Based on the transient nature of vehicles from the site and the baseline assessment of economic activity, the likely effect on the economy on a local scale will be both direct and indirect, medium term, positive and imperceptible. At a county scale, the likely effect on the economy will be both direct and indirect, medium term, positive and imperceptible.

4.5.2.3 Hydrology – Water Quality

The site is not served by Uisce Éireann mains network. All water onsite for drinking water and the proposed prefabs for both the paramedics and crew associated with the HSE Air Ambulance be served by an onsite well which was drilled in 2016.

The site will be serviced with a new proposed waste water treatment system which will serve the full site. Chapter 7 outlines mitigation measures and residual effects associated with the system.

It is considered that the residual impacts on the onsite drinking well and human health from the Proposed Development are unlikely, negative, not significant, local and long term.

4.5.2.4 Air Quality

Emissions from increased aircraft movements have been considered. Chapter 8 Air Quality has assessed the potential effects of the Proposed Development on the surrounding area. The chapter outlines the effects of the operational phase on air quality.

It is considered that the effect will be negligible and therefore, no site-specific mitigation measures are proposed.

4.5.2.5 Noise and Vibrations

The Noise and Vibration chapter (Chapter 9) has assessed the potential effects of the Proposed Development on the surrounding area. The main noise concern highlighted included the HEMS Helicopter movements and increased flight movements. Chapter 9 outlines the potential effects of the Proposed Development on the surrounding area.

It is considered that the predicted noise and vibration impacts on the receiving environment and noise sensitive locations during the operational phase are likely to be not significant and long-term.

4.5.2.6 Traffic and Transport

Chapter 12 Traffic and Transport assesses the potential effects of the Proposed Development on the surrounding road network and it is considered that there will be no residual impacts anticipated from the minimum increase in traffic generation associated with the development.

4.5.2.7 General Amenity and Tourism

The site is located in a rural setting and there is not a large amount of tourist attractions near the site. Mallow Castle is located approximately 23km east of the site. It is not expected that the Proposed Development will have a significant effect on the nearby tourism and general amenity.

4.5.3 Magnitude of Effects

The magnitude of effects was determined using the IEMA EIA Guide to Determining Significance for Human Health in Table 4-8 below.

Table 4-8 Magnitude of Effects

Criteria	Classification	Category	Justification
Scale	Local	Low	The scale of effects is considered to be negligible due to the nature of effects, rural location and size of the site.
Duration	Permanent	High	The Proposed Development is seeking permanent planning permission. Therefore, any effect caused by the Proposed Development will be permanent.
Frequency	Frequent	Medium	The effects caused by the Operational Phase, predominately includes noise, which will occur with incoming and outgoing planes and helicopters. Though given the rural aspect of the site and the current ongoing nature of the

Criteria	Classification	Category	Justification
			development with the mitigation measures and the effects minimised – it remains as frequent.
Quality of Life	Minor change	Negligible	The Proposed Development will result in a minor change in quality-of-life for the surrounding area. With the mitigation measures proposed, the effect of the Proposed Development is considered to be not significant.
Population Affected	Very Few	Negligible	The Proposed Development is located in a rural area. Very few people are predicted to be affected by the Proposed Development. The effect is considered to be negligible.
Reversibility	Gradual	Low	The Proposed Development is relatively reversible through remediation works.
Service Quality Implications	None	Negligible	There will be no service quality implication as a result of the Proposed Development.
Overall Magnitude		Low	

4.5.4 Potential Cumulative Impacts

The list of cumulative schemes considered has been detailed in Chapter 2 of this EIAR. It is not considered that the Proposed Development will act in combination or cumulatively with any existing or approved projects in the surrounding area. Refer to Chapter 2 for further information.

4.5.5 “Do Nothing” Impact

Under the “do nothing” scenario, the site would remain as a grass runway with limited year-round usability. While this would avoid any intensification-related impacts such as increased noise or emissions, it would also limit the operational capacity of the air ambulance service and the Flying Club, potentially affecting emergency response times and regional aviation infrastructure.

4.6 Avoidance, Remedial and Mitigation Measures

4.6.1 Construction Phase

No specific mitigation measures are required during the construction phase of the Proposed Development in relation to population and human health, given the lack of direct, adverse effects resulting from the Proposed Development. However, mitigation measures in relation to air quality, noise, traffic, and waste are identified in their respective chapters in this EIAR.

4.6.2 Operational Phase

No specific mitigation measures are required during the Operational Phase of the Proposed Development in relation to population and human health, given the lack of direct, adverse

effects resulting from the Proposed Development. However, mitigation measures in relation to air quality, noise, traffic, and waste are identified in their respective chapters in this EIAR.

4.6.3 “Worst Case” Scenario

In the event that mitigation measures fail to minimise and / or prevent potential adverse effects, the following possibilities may occur:

- An increase in traffic within the surrounding roads and junctions of the Site.
- An increase in noise caused during the Construction Phase can cause a disturbance to any residential dwellings in close proximity to the Site.
- An increase in the production of dust during the construction phase that can be carried throughout the Site and create adverse effects on the neighbouring environment.

However, it is imperative that such mitigation measures are implemented to ensure that the worst-case scenario does not occur. When considering the mitigation measures that will be in place, the event of a worst-case scenario is deemed to be unlikely.

4.7 Residual Impacts

Table 4-9 Residual Effects as a result of the Proposed Development

Activity	Receptor	Predicted Impact	Quality	Significance	Duration	Type	Mitigation Measures	Residual Effect
Construction Phase								
Construction phase noise	Noise Sensitive Locations (See Chapter 9 Noise and Vibration)	Noise impacts	Negative	Minor	Short term	Direct	Mitigation measures proposed in Chapter 9.	Slight
Construction phase related traffic	Receptors within 250m	Air quality impacts Nuisance	Negative	Imperceptible	Short term	Direct	Mitigation measures proposed in Chapter 8.	Imperceptible
Construction Phase Employment	Study Area	Approximately 20 Employees	Positive	Minor	Short term	Direct	N/A	Slight
Operational Phase								
Operational phase noise	Noise Sensitive Locations (See Chapter 9 Noise and Vibration)	Noise impacts	Negative	Minor	Long term	Direct	Mitigation measures proposed in Chapter 9.	Slight
Operational phase related traffic	Receptors within 250m	Air quality impacts	Negative	Imperceptible	Medium to long term	Direct	Mitigation measures proposed in Chapter 8.	Imperceptible
Operational phase related traffic	Noise Sensitive Receptors (listed in Chapter 9)	Noise impacts	Negative	Imperceptible	Medium to long term	Direct	Mitigation measures proposed in Chapter 9.	Imperceptible
Operational phase Flights	Noise Sensitive Locations (See Chapter 9 Noise and Vibration)	Noise impacts	Negative	Minor	Long term	Direct	Mitigation measures proposed in Chapter 9.	Slight

4.8 Monitoring

No specific monitoring is proposed in relation to population and human health during the construction or operational phase of the Proposed Development.

4.9 Interactions

There are numerous inter-related environmental topics described in detail throughout this EIAR document which are of relevance to population and human health.

4.9.1 Hydrology and Hydrogeology

Interactions with Hydrology and Hydrogeology during the operational phase has the potential to interact with Population and Human health due to the drinking source being from an existing groundwater well. Chapter 7 Hydrology and Hydrogeology outlines the potential effects of the Proposed Development on hydrology and hydrogeology.

4.9.2 Air Quality and Climate

Interactions with air quality during operational phase has the potential to cause nuisances. However, the mitigation measures that will be put in place during the operational phase will ensure that the impacts and their effects comply with all ambient air quality legislative limits and therefore the predicted impact is not significant with a neutral effect on human health.

4.9.3 Noise and Vibration

The noise and vibration from the Proposed Development has the potential to cause nuisances, however given the mitigation measures proposed within Chapter 9 Noise and Vibration, it is not expected that the effects will be significant.

4.9.4 Traffic and Transport

Construction activities will result in an increased number of HGV and car movements. There is a potential impact on population and human health in relation to the capacity and operation of the surrounding road network. Chapter 13 of this EIAR has predicted traffic volumes. The overall impact of the Proposed Development on the transportation infrastructure in the local area will not be significant and subsequently there will be no significant impact on population and human health.

4.10 Difficulties Encountered When Compiling

Overall, there were no difficulties encountered when compiling this Chapter of the EIAR. All research was conducted through a desk top study.

4.11 References

Assessment of Health Impacts within National Environmental Regulation Process. Report commissioned by Environmental Protection Agency. Golder Associates. April 2015.

Central Statistics Office (CSO)

Early Childhood Ireland <https://www.earlychildhoodireland.ie/childcare-search/>

Environmental Protection Agency
<https://gis.epa.ie/EPAMaps/Radon?lid=EPA:RadonMapforWorkplaces>

Go Ahead Ireland <https://www.goaheadireland.ie/services/7778006/120>

Healthy Ireland Framework 2013-2025

Cork County Development Plan 2022 – 2028

Ordinance Survey Ireland (OSI)

WHO. Ottawa Charter for Health Promotion First International Conference on Health

5 BIODIVERSITY

5.1 Introduction

This chapter provides the Ecological Impact Assessment in relation to the Proposed Development.

This Ecological Impact Assessment outlines the biodiversity (floral and faunal features) of the receiving environment within the planning application area and within a wider Zone of Influence (Zoi) in the vicinity of the Proposed Development site. It comprises information as required by Annex IV to the EIA Directive to be contained in an EIA Report (EIAR), in respect of flora and fauna.

The aims of this ecological impact assessment are to:

- Review the existing baseline ecological data for the Proposed Development Site;
- Further add to baseline information by undertaking ecological field surveys of the receiving environment at the Site;
- Identify flora and fauna present within the footprint of all elements of the Project so as to identify the receiving environment;
- Determine the ecological value of the identified ecological features;
- Identify, describe and assess the likely significant effects of the Proposed Development on biodiversity (flora and fauna);
- Propose effective mitigation measures to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on biodiversity; and
- Identify any residual effects predicted to arise after mitigation.

5.1.1 Development Description

The construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing paramedic prefabricated base and crew prefabricated base to the east of the site, and construction of a replacement paramedic prefabricated base and crew prefabricated base to the west of the site; and the breaking up / removal of a helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary waste water treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, site landscaping and all other associated site development works.

5.1.2 Quality Assurance and Competency of Experts

This Biodiversity Chapter has been completed by Karen Banks, MCIEEM. Karen is an ecologist with Greenleaf Ecology and has 18 years' experience in the field of ecological assessment. Karen has extensive experience in the production of Ecological Impact Assessments (EIA) including those for solar farms, transport infrastructure, small to large scale housing and mixed-use developments, flood alleviation schemes and wind farms.

5.2 Study Methodology

5.2.1 Guidelines

The assessment had regard to the following guidelines:

- CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine. Chartered Institute of Ecology and Environmental Management, Winchester;
- DoEHLG (2010) Appropriate Assessment of Plans and Projects in Ireland Guidance for Planning Authorities. Department of the Environment, Heritage and Local Government;
- European Communities (2000) Managing Natura 2000 Sites: the provisions of Article 6 of the 'Habitats' Directive 92/43/EEC, Office for Official Publications of the European Communities, Luxembourg. European Commission;
- EC (2021) European Commission Notice Brussels C(2021) 6913 final 'Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC';
- EC (2007) Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC – Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the commission. European Commission;
- EC (2013) Interpretation Manual of European Union Habitats. Version EUR 28. European Commission;
- EPA (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports. Draft. Environmental Protection Agency;
- Fossitt, J., 2000. A Guide to Habitats in Ireland. The Heritage Council, Kilkenny;
- HA (2001) DMRB Volume 10 Section 4 Part 4 - Ha 81/99 - Nature Conservation Advice In Relation To Otters. The Highways Agency;
- IFI (2016) Guidelines on protection of fisheries during construction works in and adjacent to waters. Inland Fisheries Ireland;
- National Parks and Wildlife Service (NPWS) (2019) The Status of EU Protected Habitats and Species in Ireland. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland;
- NRA (2008) NRA Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes. National Roads Authority;
- Smith, G. F., O'Donoghue, P., O'Hara, K., Delaney, E., 2011. Best Practice Guidance for Habitat Survey and Mapping. The Heritage Council, Kilkenny.

Studies were also carried out in accordance with the following legislation:

- Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) and Directive 2009/147/EC (codified version of Directive (79/409/EEC as amended ((Birds Directive)) – transposed into Irish law as European Communities (Birds and Natural Habitats) Regulations 2011;
- EU Environmental Impact Assessment (EIA) Directive (2011/92/EU as amended by 2014/52/EU);
- European Communities (Environmental Liability) Regulations, 2008 (S.I. No. 547 of 2008);

- European Communities (Quality of Salmonid Waters) Regulations, 1988 (S.I. No. 84 of 1988);
- Flora Protection Order, 2022;
- Planning and Development Act, 2000 (as amended);
- Water Framework Directive (2000/60/EC); and
- Wildlife Act 1976, as amended.

The following guidelines in relation to bats were referenced:

- Andrews, H. (2018) Bat Roosts in Trees. A guide to identification and assessment for tree-care and ecology professionals. Pelagic Publishing.
- Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edn). (BCT/Collins, 2023) The Bat Conservation Trust, London
- Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland (Marnell, F., Kelleher, C. & Mullen, E. (2022))

5.2.2 Desk Study

Sources of published material that were consulted as part of the desk study for the purposes of the ecological impact assessment are as follows:

- National Parks & Wildlife Service (NPWS) natural heritage database for designated areas of ecological interest and sites of nature conservation importance within the study area and its Zone of Influence;
- NPWS website (mapviewer; Article 17 mapping; FPO Bryophyte viewer);
- EIAR Biodiversity chapters or Ecological Impact Assessments for nearby development (accessed via Cork County Council or An Bord Pleanála websites);
- Review of Ordnance Survey maps and ortho-photography;
- Review of the National Biodiversity Data Centre (NBDC) database for records of rare and protected species within a 0.5km radius of the site;
- Aerial Photography;
- 1:50,000 Ordnance Survey (OS) Map; Discovery Series; and
- Environmental Protection Agency mapping (<https://gis.epa.ie/EPAMaps>).

A desk-based search of available baseline information was undertaken to identify key aquatic receptor values and/or sensitivities. Verified online information, plus published and unpublished literature and the scientific literature were consulted as appropriate. The following publicly available sources were utilised:

- Environmental Protection Agency (EPA) maps and data;
- Water Framework Directive (WFD) maps and data (<https://www.catchments.ie/>);
- NPWS maps and data (<https://www.npws.ie/maps-and-data>);
- Geohive historical mapping (<https://www.geohive.ie/>);
- Ordnance Survey of Ireland maps;
- Geological Survey of Ireland (GSI) mapviewer;
- National Biodiversity Data Centre (NBDC) maps and data; and
- Inland Fisheries Ireland (IFI) and WFD fish survey data.

5.2.3 Field Study

The habitats within the site were identified and classified according to 'A Guide to Habitats in Ireland' (Fossitt, 2000). The habitat survey of the site was undertaken on 31st July 2024. All plant species present in each habitat type, and information on dominant species and plant assemblages were recorded. Habitats have been appraised and evaluated according to their occurrence as protected habitats under Annex I of the EU Habitats Directive (92/43/EEC) and for their capacity to support rare, threatened and endangered species. The methodology used to assess the impact on habitats is based on NRA guidelines (2009 a and b), CIEEM guidelines (CIEEM, 2018) and EPA guidelines (EPA, 2022).

The habitat mapping exercise followed 'Best Practice Guidance for Habitat Survey and Mapping' (Smith et al., 2011) published by the Heritage Council.

Scientific and common names for vascular plants follow Stace (2019). In addition to habitat identification, each habitat was assessed for its ecological significance, based on the National Roads Authority (NRA) Site Evaluation Scheme (NRA, 2009a) (see Table 5-3).

Habitat boundaries and associated attribute data were mapped using desk-based GIS software, namely QGIS 3.10.

5.2.3.1 *Amphibians*

A frog survey was conducted on 25th March 2024 within suitable habitat within the site in accordance with Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes (NRA, 2009b) and Surveying for Amphibians (Froglife, 2016).

The survey comprised a visual search for common frog in ditches looking for:

- Common frog in the water, including frog spawn, tadpoles and froglets

Standing water at the site is limited to temporary flood water. The results of the survey for common frog indicated that the site is of negligible suitability for Smooth Newt, therefore a dedicated Smooth Newt survey was not required.

5.2.3.2 *Mammals*

Mammal surveys within the site were undertaken on 25th March 2024 and 31st July 2024.

Sightings, tracks or signs (including droppings, resting places, burrows and setts) of mammals occurring within, or in the immediate environs, of the site were recorded using field notes and/or handheld GPS units subsequently digitised using QGIS.

Otter surveys were undertaken along the length of the Blackwater River adjacent to the site and within accessible areas 200m up and down-stream of the site on 25th March 2024 and 31st July 2024.

Surveys were undertaken in accordance with the NRA's (2009b) 'Ecological Surveying Techniques for Protected Flora and Fauna During the Planning of National Road Schemes' and the JNCC's (2004) 'Common Standards Monitoring Guidance for Mammals'.

5.2.3.3 Bat Survey

Preliminary Ecological Appraisal

A walkover survey of areas within the site identified as potential roosting, foraging and commuting habitats during the desk top study was undertaken on 25th March 2024. Potential bat habitat was assessed using the criteria outlined in Table 5-1¹.

Table 5-1: Suitability of habitats for bats

Suitability	Description	Suitability
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/ suitable shelter at all ground/ underground levels).	No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/ protection for flight-lines, or generate/ shelter insect populations available to foraging bats).
Negligible	No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion.	No obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site, but could be used by individual hibernating bats).	Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or un-vegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat.
Moderate	Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.	
High	A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation- the categorisation described in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for flight paths such as lines of trees and scrub or linked back gardens.

¹ Collins, J. (ed.) (2023) Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th edn). The Bat Conservation Trust, London.

Bat Roost Inspection Survey

A detailed inspection of the exterior of trees was undertaken during the site walkover undertaken on 25th March 2024 to ascertain whether any features that bats could use for roosting (Potential Roost Features, or PRFs) were present. The objective of the survey was to determine the actual or potential presence of bats to carry out an impact assessment and determine the need for further survey and/or mitigation.

A detailed inspection of each potential tree roost within the site was undertaken. The inspection was carried out in daylight hours from ground level, and information was compiled on the tree, PRFs and evidence of bats. Where PRFs were recorded, the tree was numbered and marked on a map and a description of each PRF observed was recorded. PRFs that may be used by bats include:

- Rot holes;
- Hazard beams;
- Other horizontal or vertical cracks or splits (e.g. frost cracks) in stems or branches;
- Lifting bark;
- Knotholes arising from naturally shed branches or branches previously pruned back to the branch collar;
- Man-made holes (e.g. flush cuts) or cavities created by branches tearing out from parent stems;
- Cankers in which cavities have developed;
- Other hollows or cavities;
- Double leaders forming compression forks with included bark and potential cavities;
- Gaps between overlapping stems or branches;
- Partially detached ivy with stem diameters in excess of 50mm; and
- Bat or bird boxes.

Signs of a bat roost (excluding the actual presence of bats), include:

- Bat droppings in, around or below a PRF;
- Odour emanating from a PRF;
- Audible squeaking at dusk or in warm weather; and
- Staining below the PRF.

It should be noted that bats or bat droppings are the only conclusive evidence of a roost and many roosts have no external signs. In the current survey, potential roost sites were viewed by a bat specialist working from ground level. Trees were categorised according to the highest suitability PRF present.

The buildings at the site were surveyed for potential roost sites and signs of bats. The survey utilised a high-powered torch, close focussing binoculars and an endoscope (Explorer Premium 8803 with 9mm camera) where appropriate. The external inspection involved looking for bat droppings on the ground, stuck to walls, windowsills or in crevices in the stonework and recording suitable entry and exit points. The internal inspection involved looking for features that may be suitable for roosting bats, such as joints and crevices in wood, holes or crevices between stonework in the walls and searching for bat droppings, urine stains and feeding signs on the floor.

Bat Activity Survey

Bat activity surveys were conducted within the site using an Anabat Walkabout detector, which records bat echolocation calls directly on to an internal SD memory card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded. Data were then downloaded and all recordings were analysed using the Anabat Insight spectrogram sound analysis software Version 2.0.1. Dusk activity surveys (from sunset, for a minimum of 90 minutes) were conducted. These surveys enable a determination of the approximate numbers and species of bats present within the site, areas used for foraging and commuting routes to and from roosts. The approximate flying height and direction taken by bats were estimated and detailed where possible.

Assessment of bat activity was undertaken in May and July 2024. A total of 2 dusk activity surveys were completed and were undertaken on 7th May 2024 and 18th July 2024. Both surveys were conducted in appropriate weather conditions (avoiding periods of very heavy rain, strong winds (> Beaufort Force 5), mists and dusk temperatures below (10°C).

In order to supplement the information gathered from the manual activity surveys, a passive monitoring system of bat detection was also deployed for this survey scheme (i.e. a bat detector is left in the field, there is no observer present and bats which pass near enough to the monitoring unit are recorded and their calls are stored for later analysis). This results in a far greater sampling effort over a shorter period of time. Bats are identified by their ultrasonic calls. The passive detectors record bat ultrasonic calls on a continuous basis and store the information onto an internal SD card. Each time a bat is detected, an individual time-stamped (date and time to the second) file is recorded.

Passive monitoring was completed in May and July 2024 using Anabat Swift bat monitors. The passive monitoring survey was undertaken in accordance with Bat Surveys for Professional ecologists: Good Practice Guidelines (Collins, J., 2023). Weather conditions were favourable during the monitoring. A total of six Anabat Swift monitors were deployed for the survey and were positioned in field boundaries, on the bank of the Blackwater River and also adjacent to the existing runway, as illustrated in Figure 5-1. The detectors were set to record from approximately 30 minutes before sunset until sunrise and recorded for seven nights at each location. Data were then downloaded and bat echolocation calls were later analysed by the Anabat Insight software analysis programme version 2.0.1. Each time-stamped file was analysed and the species of bat recorded was noted as a bat pass.

Figure 5-1: Rathcoole Aerodrome- location of passive monitoring in May and June 2024



5.2.3.4 Avifauna

Breeding bird survey at the site was undertaken on 1st May 2024 and 16th July 2024. The entire site was surveyed, taking into account suitable habitat areas as previously identified in the desktop study and site walkover. All species that were seen or heard were recorded. All bird locations, numbers and behaviour were recorded by annotating field maps and taking notes. Breeding evidence such as singing males, agitated behaviour, carrying food and recently fledged young was recorded. The breeding status of all species encountered during surveys were classified into four categories: Confirmed (Br), Probable (Pr), Possible (Po) and Nonbreeder (N), based on British Trust for Ornithology (BTO) categories of breeding evidence, as detailed in Table 5-2. The surveys were conducted under dry, calm and light weather conditions.

Table 5-2: BTO categories of breeding bird evidence

Breeding Status	Confirmed breeder (Br)	Probable breeder (Pr)	Possible breeder (Po)	Non-breeder (N)
Observed behaviours	Distraction display or injury feigning (DD)	Pair in suitable nesting habitat (P)	Observed in suitable nesting habitat (H)	Flying Over (F)
	Used nest or eggshells found from current season (UN)	Permanent	Used nest or eggshells found from current season (UN)	Permanent
	Recently fledged young or downy young (FL)	Courtship and Display (D)		Summering non-breeder (U)
	Adults entering or leaving nest site indicating occupied nest (ON)	Visiting probable nest site (N)		
	Adult carrying faecal sac or food for young (FF)	Agitated Behaviour (A)		
	Nest containing eggs (NE)	Brood patch of incubating bird (I)		
	Nest with young seen or heard (NY)	Nest Building or excavating nest hole (B)		

5.2.4 Impact Assessment Criteria

The information gathered from desk study and survey has been used to make an ecological impact assessment (EcIA) of the Proposed Development upon the identified ecological features. The EcIA has been undertaken following the methodology set out in CIEEM (2018). EcIA is based upon a source-pathway-receptor model, where the source is defined as the individual elements of the Proposed Development that have the potential to affect identified ecological features. The pathway is defined as the means or route by which a source can affect the ecological features. An ecological feature is defined as the species, habitat or ecologically functioning unit of natural heritage importance. Each element can exist independently however an effect is created where there is a linkage between the source, pathway and feature.

A significant effect is defined in CIEEM (2018) as:

“an effect that either supports or undermines biodiversity conservation objectives for ‘important ecological features’.... or for biodiversity in general”.

Further, BS 42020:2013 states that if an effect is sufficiently important to be given weight in the planning balance or to warrant the imposition of a planning condition, e.g. to provide or guarantee necessary mitigation measures, it is likely to be “significant” in that context at the level under consideration. The converse is also true: insignificant effects would not warrant a refusal of permission or the imposition of conditions.

The valuation of ecological features is in accordance with the methodology detailed in National Roads Authority Guidelines (2009) (Table 5-3). To qualify as an important ecological feature (referred to as key ecological receptors in the NRA Guidelines), features must be of local ecological importance (higher value) or higher as per the geographical frame of reference detailed in Table 5-3. Ecological features might also be important because they play a key functional role in the landscape as 'stepping-stones' for migratory species to move during their annual migration cycle, as well as for species to move between sites, to disperse populations to new locations, to forage, or move in response to climate change. Features of lower ecological value are not assessed.

Table 5-3: Geographic reference for ecological assessment

Ratings for Ecological Sites
International Importance: 'European Site' including Special Area of Conservation (SAC), Site of Community Importance (SCI), Special Protection Area (SPA) or proposed Special Area of Conservation. Proposed Special Protection Area (pSPA). Site that fulfils the criteria for designation as a 'European Site' (see Annex III of the Habitats Directive, as amended). Features essential to maintaining the coherence of the Natura 2000 Network. Site containing 'best examples' of the habitat types listed in Annex I of the Habitats Directive. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; and/or Species of animal and plants listed in Annex II and/or IV of the Habitats Directive. Ramsar Site (Convention on Wetlands of International Importance Especially Waterfowl Habitat 1971). World Heritage Site (Convention for the Protection of World Cultural & Natural Heritage, 1972). Biosphere Reserve (UNESCO Man & the Biosphere Programme). Site hosting significant species populations under the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals, 1979). Site hosting significant populations under the Berne Convention (Convention on the Conservation of European Wildlife and Natural Habitats, 1979). Biogenetic Reserve under the Council of Europe. European Diploma Site under the Council of Europe. Salmonid water designated pursuant to the European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988).
National Importance: Site designated or proposed as a Natural Heritage Area (NHA). Statutory Nature Reserve. Refuge for Fauna and Flora protected under the Wildlife Acts. National Park. Undesignated site fulfilling the criteria for designation as a Natural Heritage Area (NHA); Statutory Nature Reserve; Refuge for Fauna and Flora protected under the Wildlife Act; and/or a National Park. Resident or regularly occurring populations (assessed to be important at the national level) of the following: Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list. Site containing 'viable areas' of the habitat types listed in Annex I of the Habitats Directive.
County Importance: Area of Special Amenity. Area subject to a Tree Preservation Order. Area of High Amenity, or equivalent, designated under the County Development Plan. Resident or regularly occurring populations (assessed to be important at the County level) of the following: Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive; Species of animal and plants listed in Annex II and/or IV of the Habitats Directive; Species protected under the Wildlife Acts; and/or Species listed on the relevant Red Data list.

Ratings for Ecological Sites

Site containing area or areas of the habitat types listed in Annex I of the Habitats Directive that do not fulfil the criteria for valuation as of International or National importance.

County important populations of species or viable areas of semi-natural habitats or natural heritage features identified in the National or Local BAP, if this has been prepared.

Sites containing semi-natural habitat types with high biodiversity in a county context and a high degree of naturalness, or populations of species that are uncommon within the county.

Sites containing habitats and species that are rare or are undergoing a decline in quality or extent at a national level.

Local Importance (higher value):

Locally important populations of Priority species or habitats or natural heritage features identified in the Local Biodiversity Action Plan (BAP), if this has been prepared;

Resident or regularly occurring populations (assessed to be important at the Local level) of the following:

Species of bird, listed in Annex I and/or referred to in Article 4(2) of the Birds Directive;

Species of animal and plants listed in Annex II and/or IV of the Habitats Directive;

Species protected under the Wildlife Acts; and/or

Species listed on the relevant Red Data list.

Sites containing semi-natural habitat types with high biodiversity in a local context and a high degree of naturalness, or populations of species that are uncommon in the locality;

Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value.

Local Importance (lower value):

Sites containing small areas of semi-natural habitat that are of some local importance for wildlife;

Sites or features containing non-native species that are of some importance in maintaining habitat links.

5.3 The Existing and Receiving Environment (Baseline Situation)

5.3.1 Designated Sites

The site does not comprise any protected areas. There are four European Sites within 15km of the study area. Blackwater River (Cork/Waterford) SAC is located directly adjacent to the site. A review of nationally designated sites indicates that there are two sites designated for nature conservation within 10km of the site: Boggeragh Mountains NHA and Banteer Ponds pNHA.

A list of European sites (Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)) recorded within 15km of the site is presented in Table 5-4 and a list of nationally designated sites (Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs)) is presented in Table 5-5. European Sites are illustrated in Figure 5-2 and nationally designated sites are illustrated in Figure 5-3.

A Natura Impact Statement for the Proposed Development, prepared in accordance with the requirements of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011) as amended and the Planning and Development Act (as amended), is presented separately to this EIAR and also accompanies this planning application.

Table 5-4: European sites within a 15km radius of the Proposed Development

Site Name and Code	Qualifying Interests (Annex I Habitats/Annex II Species)	Distance from Proposed Development (km) ²	Connectivity
Blackwater River (Cork/Waterford) SAC (002170)	Estuaries [1130] Mudflats and sandflats not covered by seawater at low tide [1140] Perennial vegetation of stony banks [1220] Salicornia and other annuals colonising mud and sand [1310] Atlantic salt meadows (<i>Glaucopuccinellietalia maritima</i>) [1330] Mediterranean salt meadows (<i>Juncetalia maritimi</i>) [1410] Water courses of plain to montane levels with the <i>Ranunculus fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0] <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] <i>Austropotamobius pallipes</i> (White-clawed Crayfish) [1092] <i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Alosa fallax fallax</i> (Twait Shad) [1103] <i>Salmo salar</i> (Salmon) [1106] <i>Lutra lutra</i> (Otter) [1355] <i>Trichomanes speciosum</i> (Killarney Fern) [1421]	0km (Directly adjacent)	Potential connectivity due to proximity and hydrological connectivity via a drainage ditch. The site and this SAC are both within the Rathmore West Ground Waterbody. GW and SW connectivity exists.

² Straight line distance

Site Name and Code	Qualifying Interests (Annex I Habitats/Annex II Species)	Distance from Proposed Development (km) ²	Connectivity
Killarney National Park, Macgillicuddy's Reeks and Caragh River Catchment SAC (000365)	Oligotrophic waters containing very few minerals of sandy plains (<i>Littorelletalia uniflorae</i>) [3110] Oligotrophic to mesotrophic standing waters with vegetation of the <i>Littorelletea uniflorae</i> and/or <i>Isoeto-Nanojuncetea</i> [3130] Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitriche-Batrachion</i> vegetation [3260] Northern Atlantic wet heaths with <i>Erica tetralix</i> [4010] European dry heaths [4030] Alpine and Boreal heaths [4060] <i>Juniperus communis</i> formations on heaths or calcareous grasslands [5130] Calaminarian grasslands of the <i>Violetalia calaminariae</i> [6130] <i>Molinia</i> meadows on calcareous, peaty or clayey-silt-laden soils (<i>Molinion caeruleae</i>) [6410] Blanket bogs (* if active bog) [7130] Depressions on peat substrates of the <i>Rhynchosporion</i> [7150] Old sessile oak woods with <i>Ilex</i> and <i>Blechnum</i> in the British Isles [91A0] Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (Alno-Padion, Alnion incanae, Salicion albae) [91E0] <i>Taxus baccata</i> woods of the British Isles [91J0] <i>Geomalacus maculosus</i> (Kerry Slug) [1024] <i>Margaritifera margaritifera</i> (Freshwater Pearl Mussel) [1029] <i>Euphydryas aurinia</i> (Marsh Fritillary) [1065]	11.8km	There is no connectivity via surface water, ground water or any other pathway.

Site Name and Code	Qualifying Interests (Annex I Habitats/Annex II Species)	Distance from Proposed Development (km) ²	Connectivity
	<i>Petromyzon marinus</i> (Sea Lamprey) [1095] <i>Lampetra planeri</i> (Brook Lamprey) [1096] <i>Lampetra fluviatilis</i> (River Lamprey) [1099] <i>Salmo salar</i> (Salmon) [1106] <i>Rhinolophus hipposideros</i> (Lesser Horseshoe Bat) [1303] <i>Lutra lutra</i> (Otter) [1355] <i>Trichomanes speciosum</i> (Killarney Fern) [1421] <i>Najas flexilis</i> (Slender Naiad) [1833] <i>Alosa fallax killarnensis</i> (Killarney Shad) [5046]		
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)	Hen Harrier (<i>Circus cyaneus</i>) [A082]	12.6km	There is no connectivity via surface water, ground water or any other pathway.
Mullaghanish to Musheramore Mountains SPA (004162)	Hen Harrier (<i>Circus cyaneus</i>) [A082]	9.5km	There is no connectivity via surface water, ground water or any other pathway.

Table 5-5: Nationally designated sites within a 10km radius of the Proposed Development

Site Name and Code	Qualifying Interests	Distance from Proposed Development (km) ³	Connectivity
Boggeragh Mountains NHA (002447)	Peatlands	8.4km	There is no connectivity via surface water, groundwater or any other pathway.
Banteer Ponds pNHA (001036)	No Site Synopsis available	4.3km	There is no connectivity via surface water, groundwater or any other pathway.

³ Straight line distance

Figure 5-2: European sites within a 15km radius of the site

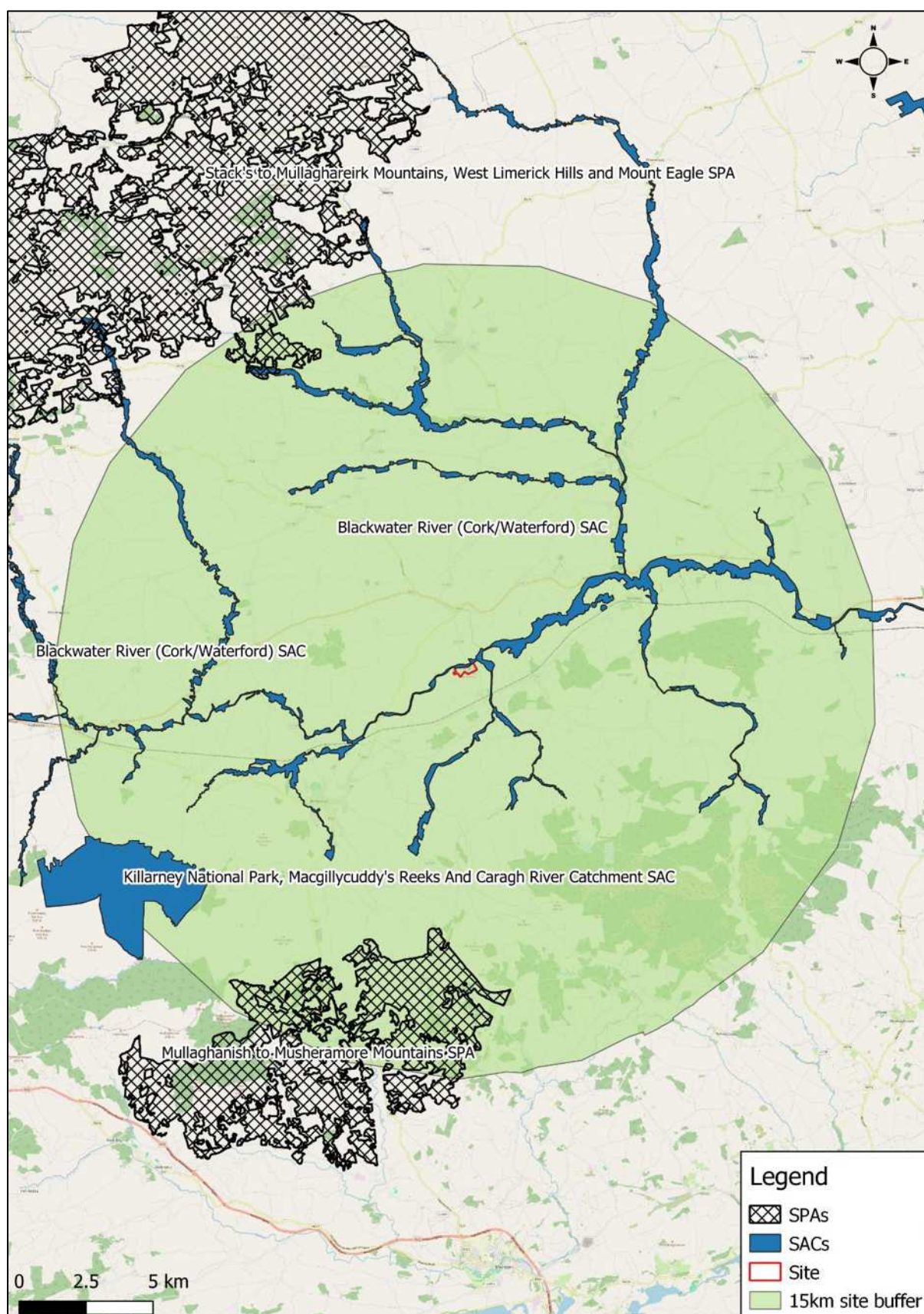
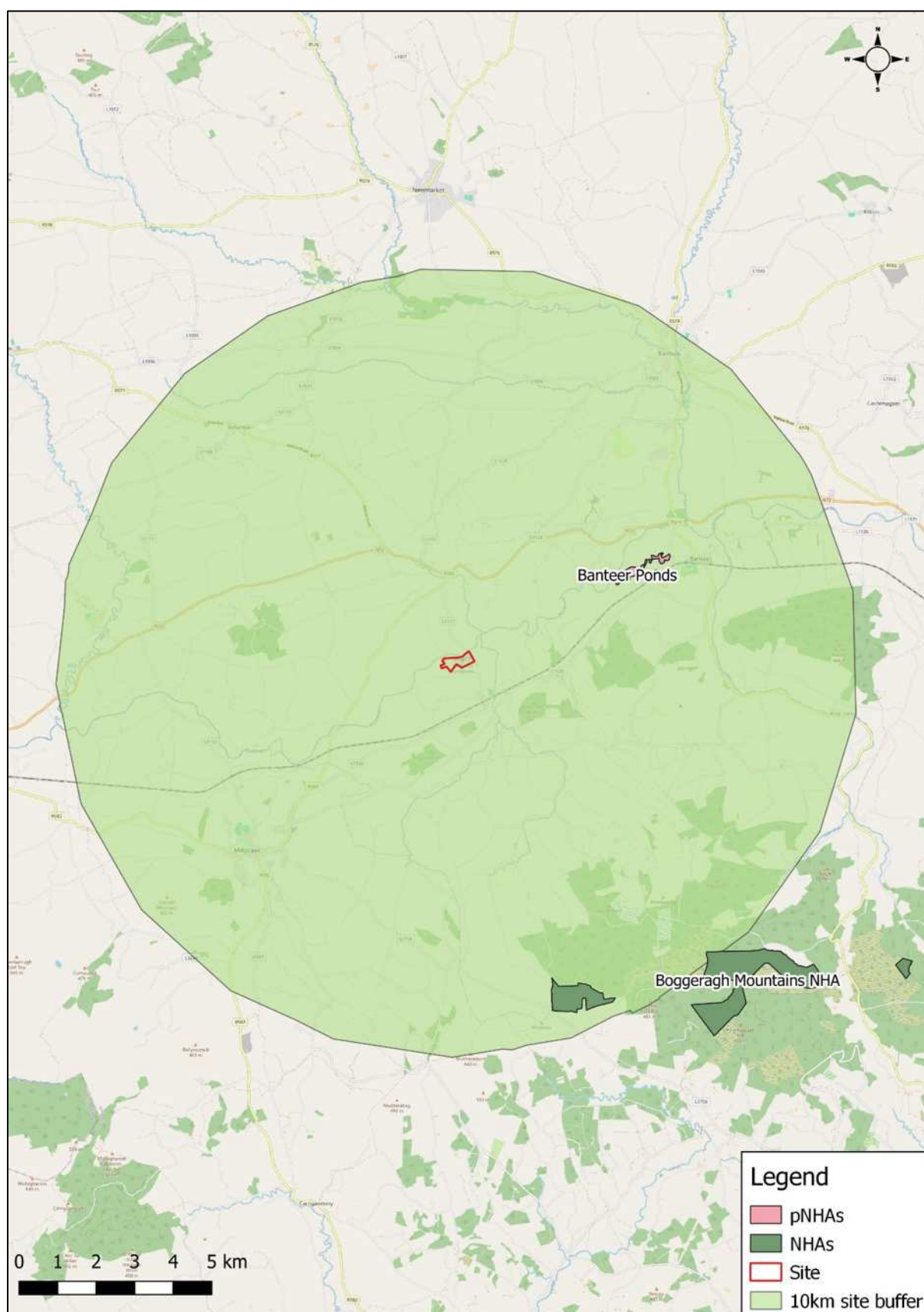


Figure 5-3: Nationally designated sites within a 10km radius of the site



5.3.2 Habitats

A description of the habitats within the site is presented below. A habitat map (Figure 5-4) has been prepared to illustrate and classify habitats identified within the site. The site predominantly supports semi-improved grassland and improved agricultural grassland fringed by linear woodland habitats, conifer plantation, drainage channels and a watercourse.

5.3.2.1 Improved agricultural grassland (GA1)

This habitat is present to the west of the existing runway. The improved grassland habitat supports Perennial Rye-grass (*Lolium perenne*), with occasional Sweet Vernal-grass (*Anthoxanthum odoratum*), Timothy (*Phleum pratense*), Yorkshire Fog (*Holcus lanatus*), White Clover (*Trifolium repens*), Dandelion (*Taraxacum* agg.) and Creeping Buttercup (*Ranunculus repens*).

5.3.2.2 Dry meadows and grassy verges (GS2)

The existing runway is kept tightly mown, but the surrounding grassland is cut on a yearly basis. Sweet Vernal-grass is abundant in the sward; Yorkshire Fog and Common Bent (*Agrostis capillaris*) are frequent and Red Fescue (*Festuca rubra*) is a rare component of the sward. Herbs present include Common Cat's-ear (*Hypochaeris radicata*), Dandelion, Common Bird's-foot-trefoil (*Lotus corniculatus*), Cuckooflower (*Cardamine pratensis*), Ribwort Plantain (*Plantago lanceolata*), Common Sorrel (*Rumex acetosa*), Self-heal (*Prunella vulgaris*) and Yarrow (*Achillea millefolium*). The bryophyte *Calliergonella cuspidata* is frequent and a brown crustose lichen (not identified to species level) is occasional and locally frequent.

5.3.2.3 Arable crops (BC1)

The westernmost part of the site supports arable crops.

5.3.2.4 Buildings and artificial surfaces (BL3)

This habitat is represented by the existing buildings and access tracks at the site.

5.3.2.5 Lowland depositing river (FW2)

The Blackwater (Munster) River is not located within the site boundary but is adjacent to part of the northern site boundary; the Blackwater (Munster) River forms part of the Blackwater River (Cork/Waterford) SAC. The Blackwater River rises in the Mullaghareirk Mountains in County Kerry and then flows in an easterly direction through County Cork, through Mallow and Fermoy. It then enters County Waterford where it flows through Lismore before abruptly turning south at Cappoquin and finally draining into the sea at Youghal Harbour. In total, the Munster Blackwater is 120 km long.

The Blackwater River is a salmonid river and is included within the S.I. 293: European Communities (Quality of Salmonid Waters) Regulations, 1988. Salmon (both 0+ and 1+ and older salmon) have been recorded upstream and downstream of the site during surveys conducted by IFI in 2022.⁴

The results from presence/absence and total counts surveys for freshwater pearl mussel show that the Munster Blackwater has a scattered population of mussels over a very wide area from

⁴ As Ref 7.

upstream at Knocknagree to as far downstream as Lismore⁵. Conservation Objective mapping for Blackwater River (Cork/ Waterford) SAC⁶ indicates that the stretch of the Blackwater River adjacent to the site is located within the known distribution range for freshwater pearl mussel.

Lamprey species have been recorded upstream of the site at Nohoval⁷ and downstream of the site near Banteer.

At its location adjacent to the site, riparian vegetation along the Blackwater River comprised abundant Bracken (*Pteridium aquilinum*), False Oat-grass (*Arrhenatherum elatius*), Cock's-foot (*Dactylis glomerata*) and occasional Meadowsweet (*Filipendula ulmaria*) and Creeping Thistle (*Cirsium arvense*). Trees present at the riverbank included Alder (*Alnus glutinosa*), Ash (*Fraxinus excelsior*), Hawthorn (*Crataegus monogyna*), Willow (*Salix cinerea*) and Sycamore (*Acer pseudoplatanus*).

5.3.2.6 Drainage ditch (FW4)

A drainage ditch runs from west to east through the site and is culverted under the existing runway. The drainage ditch supported flowing water during the site survey undertaken in March 2024, but had dried to very low levels of sluggish water by May 2024. Emergent vegetation includes False Oat-grass, Cock's-foot, Common Reed (*Phragmites australis*), with Soft Rush (*Juncus effusus*) and Tufted Hair-grass (*Deschampsia caespitosa*) locally. Herbs included Meadowsweet, Purple Loosestrife (*Lythrum salicaria*) and Hemp Agrimony (*Eupatorium cannabinum*).

It is noted that a drainage channel is also present in association with a hedge running north-south through the site. However, this channel was not conveying water during the site surveys and did not support vegetation and, as such has not been included within this habitat.

5.3.2.7 Hedgerow (WL1)

Hedgerows bound the site to the south, adjacent to the local road. Species present include Ash, Elm (*Ulmus* spp), Hawthorn, Blackthorn (*Prunus spinosa*), Willow and Alder locally.

5.3.2.8 Treeline (WL2)

A treeline bounds the site to the east adjacent to the L1117. Species present include Sycamore, Hazel (*Corylus avellana*), Hawthorn, Ash, Blackthorn, Elm and Willow, with Gorse and Bramble (*Rubus fruticosus*) present at the edge of the field.

5.3.2.9 Earth bank (BL2)

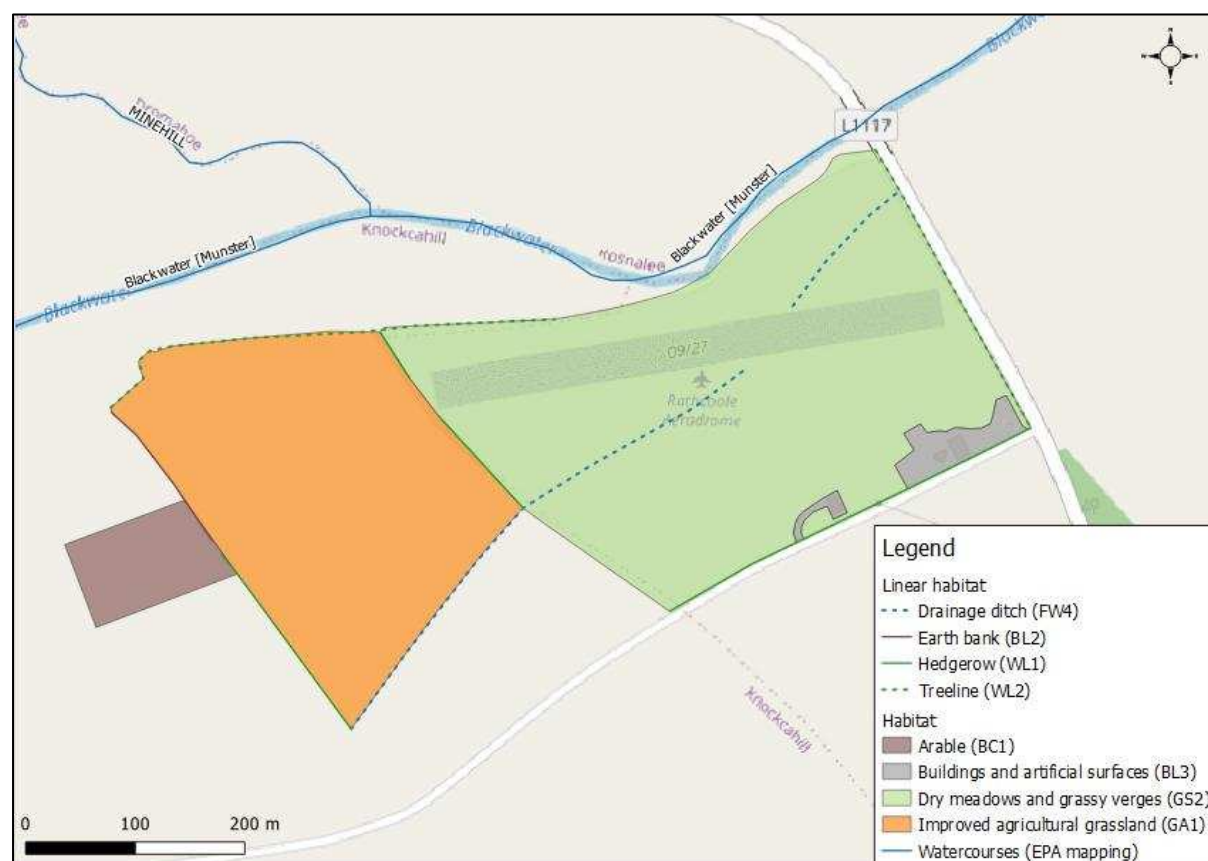
The field boundaries running from north to south within the site are earth banks vegetated with grasses, Bracken, and occasional trees and shrubs including Willow, Sycamore and Blackthorn.

⁵ Atkinson, S., Magee, M., Moorkens, E.A. & Heavey, M. (2023). Supplementary Guidance on Assessment and Construction Management in Margaritifera Catchments in Ireland: Blackwater River (Cork/Waterford) SAC <https://e-mussels.eu/europe/conservation-guidelines>

⁶ [Site specific cons_obj \(npws.ie\)](https://www.npws.ie/en/conservation/objectives/site-specific-conservation-objectives)

⁷ Inland Fisheries Ireland (2023) Fish in Rivers Factsheet: Blackwater (Munster) River Catchment Factsheet 2023/06.

Figure 5-4: Habitats present at the site



5.3.3 Species

This section describes the species that have been recorded historically within the vicinity of the site, results from site surveys and the potential for the site to support protected species. Species records extracted from the NBDC database are included in Appendix 5-1 NBDC Records from within 0.5km of the Proposed Development.

5.3.3.1 Amphibians and Reptiles

The NBDC do not hold any records of amphibians from the site and its environs. A survey for amphibians was conducted at the site in March 2024. A strong flow was evident within the drainage channel at the time of survey and the site lacks standing water and waterlogged habitats. As such, the site is of low suitability for amphibians and no evidence of amphibians was recorded during the site survey.

5.3.3.2 Avifauna

The NBDC hold records of three species included in Annex I of the EU Bird's Directive from the environs of the site, namely Kingfisher, Corn Crake and Hen Harrier.

Six BoCCI Red List species (Gilbert, G. *et al* (2021)) have been recorded from the environs of the site: Barn Owl, Black-headed Gull, Corn Crake, Eurasian Curlew, Northern Lapwing and Yellowhammer.

The findings of the breeding bird survey completed at the site on 1st May 2024 and 16th July 2024 are presented in Table 5-6.

Avifaunal species recorded at the site reflected the habitats present. The fields supported relatively low levels of avifaunal diversity, with species recorded restricted to corvids, with Swallow flying over the fields.

The treeline and hedgerow habitats at the field boundaries supported a higher diversity of bird species. Passerines such as Robin, Wren, Goldfinch, Chaffinch, Chiffchaff, Song Thrush and Mistle Thrush were recorded, in addition to several Blackbird. Grey Wagtail was recorded on the southern bank of the Blackwater River adjacent to the site and a pair of Mallard were recorded in a wet ditch to the north of the site (outside of the site boundary). Swallow nest at the club house building and Starling nest on the hangar within the site. Of the bird species recorded at the site and its environs, Grey Wagtail is on the BoCCI Red List (Highest Conservation Concern), Linnet, Mallard, Starling, Swallow and Willow Warbler are on the Amber List (Moderate Conservation Concern); the remaining species are on the Green List (Least Conservation Concern).

Table 5-6: Results of breeding bird survey (May and July 2024)

Common Name	Species Name	BoCCI	Breeding Evidence ⁸
Blackbird	<i>Turdus merula</i>	Green	Po (H)
Blackcap	<i>Sylvia atricapilla</i>	Green	Po (H)
Blue Tit	<i>Cyanistes caeruleus</i>	Green	Po (H)
Chaffinch	<i>Fringilla coelebs</i>	Green	Po (H)
Chiffchaff	<i>Phylloscopus collybita</i>	Green	Po (S)
Dunnock	<i>Prunella modularis</i>	Green	Po (H)
Goldfinch	<i>Carduelis carduelis</i>	Green	Po (S)
Grey Wagtail	<i>Motacilla cinerea</i>	Red	Po (H)
Jackdaw	<i>Coloeus monedula</i>	Green	N (F)
Linnet	<i>Linaria cannabina</i>	Amber	Po (H)
Long-tailed Tit	<i>Aegithalus caudatus</i>	Green	Po (S)
Mallard	<i>Anas platyrhynchos</i>	Amber	Pr (P)
Mistle Thrush	<i>Turdus viscivorus</i>	Green	Po (H)
Pheasant	<i>Phasianus colchicus</i>	Green	Po (H)
Robin	<i>Erithacus rubecula</i>	Green	Po (S)
Rook	<i>Corvus frugilegus</i>	Green	N (F)
Song Thrush	<i>Turdus philomelos</i>	Green	Po (S)
Starling	<i>Sturnus vulgaris</i>	Amber	Br (ON)
Swallow	<i>Hirundo rustica</i>	Amber	Br (ON)
Willow Warbler	<i>Phylloscopus trochilus</i>	Amber	Po (S)
Wood Pigeon	<i>Columba palumbus</i>	Green	Po (H)
Wren	<i>Troglodytes troglodytes</i>	Green	Po (S)

⁸ In accordance with BTO categories of breeding bird evidence, see Table 5-2

5.3.3.3 Flora

There are no records of protected species of vascular plants or bryophytes from the footprint of the site and no rare or protected species of flora were recorded during the site survey.

5.3.3.4 Invasive Plant Species

The following invasive plant species have been recorded in the environs of the site:

- Canadian Waterweed (High Impact), recorded at the L1117 bridge, last recorded in 2006.
- Japanese Knotweed (High Impact, included in European Union (Invasive Alien Species) Regulations 2024 (S.I. No. 374 of 2024)), recorded to the north of the L1117 bridge, last recorded in 2017.

Japanese Knotweed was observed to be present to the north of the L1117 bridge (Colthurst Bridge) during site surveys. However, no invasive species were recorded within the site and its immediate environs.

5.3.3.5 Invertebrates

The NBDC does not hold any records of protected species of invertebrate from the site and its environs. The grassland at the site is of low suitability to support protected species of invertebrates and no rare or protected species of invertebrate were recorded at the site during the site survey.

5.3.3.6 Bats

The review of existing records of bat species in the environs of the study area indicates that three of the ten known Irish species of bat have been recorded within a 4km radius of the site (last checked September 2024). These bats include common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*P. pygmaeus*) and brown long-eared bat (*Plecotus auritus*) as shown in Table 5-7 below. Of these species, brown long-eared bat has been recorded roosting within 4km of the site.

Table 5-7: NBDC bat records from within a 4km radius of the site.

Common Name	Scientific Name	Present (Y/N)	Known Roost (to OS 1km grid square)	Date of Last Record
Pipistrelle sp.	<i>Pipistrellus pipistrellus sensu lato</i>	N	n/a	n/a
Soprano Pipistrelle	<i>Pipistrellus pygmaeus</i>	Y	None	19/07/2008
Common Pipistrelle	<i>Pipistrellus pipistrellus</i>	Y	None	19/07/2008
Nathusius's Pipistrelle	<i>Pipistrellus nathusii</i>	N	n/a	n/a
Leisler's Bat	<i>Nyctalus leisleri</i>	N	n/a	n/a
Brown Long-eared Bat	<i>Plecotus auratus</i>	Y	W3397	15/07/2022
Daubenton's Bat	<i>Myotis daubentoniid</i>	N	n/a	n/a
Whiskered Bat	<i>Myotis mystacinus</i>	N	n/a	n/a
Natterer's Bat	<i>Myotis nattereri</i>	N	n/a	n/a
Lesser Horseshoe Bat	<i>Rhinolophus hipposideros</i>	N	n/a	n/a
Brandt's Bat	<i>Myotis brandtii</i>	N	n/a	n/a

The bat landscape association model (Lundy *et al*, 2011) suggests that the study area is part of a landscape that is of moderate to high suitability for bats including common pipistrelle, soprano pipistrelle, brown long-eared, Leisler's, Natterer's and whiskered bat. The study area and its environs are of low suitability to moderate suitability for Nathusius' pipistrelle, lesser horseshoe bat and Daubenton's bat.

Review of aerial photography and the results of the site walkover indicate that the site comprises grassland fields bound by hedgerows, treelines, vegetated earth banks, conifer plantation edge and watercourses. These linear features connect the site to suitable bat foraging areas in the wider landscape. In accordance with the criteria outlined in Table 5-1, the commuting and foraging habitats at the site and its environs are of moderate to high suitability for bats.

Roosting Habitat Survey

Most trees at the site were semi-mature, thin boled and did not support large crevices, apertures or dense ivy growth that could provide suitable roosting habitat for bats. No potential roosting features were recorded within trees at the site, however there is potential for hidden roosting features to be present in some of the more mature trees within the field boundary at the east of the site.

The buildings at the site include the air ambulance base, hangar and club house. No features suitable for roosting bats were recorded within these buildings.

Activity Survey

Seven bat species were recorded during passive monitoring undertaken in May 2024 and July 2024, namely common pipistrelle, soprano pipistrelle, Leisler's, Natterer's, Daubenton's, whiskered and brown long-eared bat. Bat activity was variable across the site. The highest level of activity was recorded adjacent to the Blackwater River, with a relatively high level of activity also recorded on the western and northern site boundary. A low level of activity was recorded adjacent to the existing runway. As detailed in Table 5-8, the most frequently recorded species was soprano pipistrelle, followed by common pipistrelle then Leisler's bat.

Natterer's, whiskered and Daubenton's bat were recorded in low numbers and *Myotis* species of bat (unidentifiable to species level) were recorded across the site, with the highest activity level recorded on PM1 adjacent to the Blackwater River. A relatively low amount of brown long-eared bat activity was also recorded across the site.

A small number of calls that were not of sufficient quality to enable call identification were also recorded on PM1, PM3, PM4 and PM6 (Table 5-8).

Leisler's bat was recorded commuting across the site early in the evening on PM1 and PM3 (c.28 minutes before sunset at the earliest), soprano pipistrelle was recorded c.25mins after sunset on PM3 and *Myotis* species were recorded c.28 mins after sunset PM1, indicating the likely presence of a roost for these species nearby.

The calls recorded on the passive monitors are summarised in Table 5-8. The location of the passive detectors is illustrated in Figure 5-1.

Table 5-8: Summary table of bat passes recorded on the passive monitors in May and July 2024

Species	PM1	PM2	PM3	PM4	PM5	PM6	Total
	07/05/2024-13/05/2024			18/07/2024-24/07/2024			
Common Pipistrelle	1,848 (36%)	1,027 (31%)	372 (26%)	359 (24%)	947 (24%)	39 (7%)	4,592 (29%)
Soprano Pipistrelle	1,450 (28%)	1,496 (45%)	789 (56%)	713 (48%)	2,403 (62%)	245 (43%)	7,096 (45%)
Pipistrelle species ⁹	55 (1%)	24 (1%)	67 (5%)	46 (3%)	2 (0%)	15 (3%)	209 (1%)
Leisler's	552 (11%)	733 (22%)	117 (8%)	304 (20%)	545 (14%)	259 (45%)	2,510 (16%)
Natterer's	2 (0%)	0	0	8 (1%)	1 (0%)	0	11 (0%)
Daubenton's	4 (0%)	4 (0%)	8 (1%)	0	0	0	16 (0%)
Whiskered	1 (0%)	0	0	0	0	0	1 (0%)
Myotis Species	1,202 (23%)	44 (1%)	50 (4%)	47 (3%)	9 (0%)	12 (2%)	1,364 (9%)
Brown Long-eared	4 (0%)	10 (0%)	9 (1%)	8 (1%)	0	1 (0%)	32 (0%)
No ID	5 (0%)	0	2 (0%)	1 (0%)	0	3 (1%)	11 (0%)
Total	5,123	3,338	1,414	1,486	3,907	574	15,842

Five species of bat were recorded within the site during the activity transects undertaken in May and July 2024. These species were common pipistrelle, soprano pipistrelle, Leisler's bat, whiskered bat and brown long-eared bat. The highest levels of activity were recorded alongside the bank of the Blackwater River and along the L1117 adjacent to the eastern site boundary. A relatively high level of pipistrelle and Leisler's bat activity was also recorded at the field boundary running north-south towards the western end of the existing runway. The most frequently recorded species was soprano pipistrelle, followed by common pipistrelle then Leisler's bat. Whiskered and Daubenton's bat were recorded foraging along the Blackwater River and brown long-eared bat was recorded along the treeline located on the northern site boundary.

5.3.3.7 Badger

The NBDC hold records of badger from the OS 1km Grid Square overlapping the site (W3295). The field boundaries at the site are open and are of low suitability for badger. No badger setts or evidence of badger was recorded within the site during the site survey.

5.3.3.8 Otter

The National Biodiversity Data Centre (NBDC) database hold records of otter from Colthurst Bridge, last recorded in 2015. No otter holts were recorded within or adjacent to the site during the site surveys, however otter prints were recorded in soft mud at the west of the site during a site survey in March 2024.

⁹ *Pipistrellus* spp. which have frequency of maximum energy, FMAXE, of c. 50kHz which cannot reliably be assigned to Common Pipistrelle (typical FMAXE of c. 45kHz) or Soprano Pipistrelle (FMAXE c. 55kHz)

5.3.3.9 Other mammals

The NBDC hold records of Sika deer from the 10km OS grid square within which the site is located (W39), last recorded in 2008. Deer slots were recorded at the south-west of the site in May 2024, however the site is unlikely to provide sustained support for this species.

5.3.4 Summary of Ecological Evaluation

Table 5-9 summarises all identified ecological features. Ecological features have been identified as being at risk of potentially significant impacts via a source-pathway-receptor link. Important ecological features are valued as being of local ecological importance (higher value) or above as per the criteria set out in Table 5-3.

Table 5-9: Ecological features within the site and it's receiving environment

Site/ Habitat/ Species	Ecological Value ¹⁰	Important Ecological Feature
European Site	International. There is potential direct connectivity to Blackwater River (Cork/Waterford) SAC adjacent to the northern site boundary (see Error! Reference source not found.).	Yes
Natural Heritage Area	National. There is no connectivity between the Proposed Development and nationally designated sites (see Table 3-2).	No
Depositing Lowland Rivers (FW2)	The Blackwater (Munster) River adjacent to the site forms part of the Blackwater River (Cork/Waterford) SAC. The Blackwater River is a Salmonid river and is known to support lamprey species, freshwater pearl mussel and otter in the vicinity of the site. The Blackwater River is of International Importance.	Yes
Drainage Ditches (FW4)	Local importance (higher value). The drainage ditch at the site is not of fisheries value. While the ditch does not support a diverse in-stream flora, the emergent vegetation is relatively species rich. The ditch provides connectivity in the landscape and is considered to be of local importance to avifauna, invertebrates and small mammals as a viable foraging habitat and localised refuge.	Yes
Hedgerows (WL1)	Local importance (higher value). Linear woodland habitats such as hedgerows and treelines provide valuable ecosystem services for other semi-natural habitats and faunal species in the locality in terms of cover, refuge and connectivity. This is particularly the case for areas dominated by improved and semi-improved grassland habitats, such as the site and its environs.	Yes
Treelines (WL2)	Local importance (higher value). Linear woodland habitats such as hedgerows and treelines provide valuable ecosystem services for other semi-natural habitats and faunal species in the locality in terms of cover, refuge and connectivity. This is particularly the case for areas dominated by improved and semi-	Yes

¹⁰ In accordance with NRA (2009) Guidelines for the Assessment of Ecological Impacts of National Road Schemes Rev. 2. National Roads Authority

Site/ Habitat/ Species	Ecological Value ¹⁰	Important Ecological Feature
	improved grassland habitats, such as the site and its environs.	
Earth banks (BL2)	The earth banks at the site are variable in their vegetative composition, generally support occasional shrub and tree species and are not of botanical importance. Nonetheless, they do provide connectivity in the landscape and provide habitat for avifauna and small mammals and are considered to be of Local Importance (Higher Value).	Yes
Improved Agricultural Grassland (GA1)	Local importance (lower value). A habitat of low ecological value for flora, habitats and non-volant mammals comprising poor floristic diversity.	No
Dry meadows and grassy verges (GS2)	Local importance (higher value). This habitat (excluding the runway) is managed by cutting once a year and supports a moderately species rich sward in the context of the improved grassland dominating the surrounding landscape. This habitat is of ecological value for flora, habitats, invertebrates and non-volant mammals.	Yes
Arable crops (BC1)	Local importance (lower value). A habitat of low ecological value for flora, habitats and non-volant mammals.	No
Buildings and artificial surfaces (BL3)	Negligible ecological value. This habitat includes the local road network and access tracks.	No
Amphibians & Reptiles	The drainage ditch at the site supports a strong flow during periods of high rainfall and, as such, is of negligible to low potential for breeding amphibians. No evidence of amphibians was recorded during the site survey.	No
Avifauna	Avifauna as they occur within the site are considered to be of local importance (higher value).	Yes
Bats	No bat roosts were recorded within the site. The Blackwater River, hedgerows and treelines at the site provide foraging and commuting habitat for seven species of bat and the site is located within a landscape of moderate to high suitability for foraging and commuting bats. Bats, as they occur at the site, are considered to be of local importance (higher value).	Yes
Otter	Local importance (higher value). No otter holts were recorded at the site and its environs. However, otter prints were recorded within the site and it is likely that otter forage along the Blackwater River in the environs of the site.	Yes
Badger	No evidence of badger was recorded within the site. However, it is likely that badger forage throughout the site.	Yes
Other mammals	The site is of low suitability as a sustained resource for other mammal species, including deer.	No

5.4 Characteristics of the Proposed Development

The construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing paramedic prefabricated base and crew prefabricated base to the east of the site, and

construction of a replacement paramedic prefabricated base and crew prefabricated base to the west of the site; and the breaking up / removal of a helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary waste water treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, site landscaping and all other associated site development works.

The full development description is provided in Chapter 1 of this EIAR.

The following characteristics of the Proposed Development are of relevance to this Chapter:

- The proposed works will include site clearance and excavation for the runway, taxiway, drainage trenches, and new air ambulance base.
- The drainage ditch will be culverted for c.30m either side of the new runway.
- A wastewater treatment system will be provided at the west of the site, to the north of the proposed operations base and paramedic base buildings.
- 1 no. surface water soakaway and hydrocarbon separator will be constructed to dispose of run-off from the helipad.
- 1 no. surface water soakaway will be constructed to dispose of run-off water from the proposed building roofs.
- Approximately 130 linear metres of hedgerow vegetated earth banks will be removed to facilitate the new runway.
- Approximately 40 linear metres of hedgerow will be removed to facilitate the provision of sightlines at the new entrance.

During the operational phase, it is projected that the use of the Aerodrome by Rathcool Flying Club will increase from c.1,910 flight movements per annum¹¹ to approximately 3,849 flight movements per annum by 2029, the use by the air ambulance service is projected to remain broadly in line with current patterns.

5.5 Potential Impact of the Proposed Development

5.5.1 Construction Phase

The ecological features that, in the absence of mitigation, may potentially be affected by the construction phase of the proposed development and the significance of these effects are set out in the following sections.

5.5.1.1 Designated Sites

The potential significant effects on European sites as a result of the Proposed Development at Rathcoole Aerodrome are primarily related to a change in water quality within Blackwater River (Cork/Waterford) SAC and disturbance impacts. With adherence to best practice construction guidelines and the specific mitigation measures provided within the report, the NIS concluded that:

¹¹ as measured over the past 3 years

“there will be no potential for direct, indirect or cumulative impacts arising from the proposed Development at Rathcoole Aerodrome, Co. Cork either alone or in combination with any other plans or projects. The integrity of the Blackwater River (Cork/Waterford) SAC will not be adversely affected. No reasonable scientific doubt remains as to the absence of such adverse effects.”

Full details on the potential impacts on European sites can be found in the NIS accompanying the Planning Application.

There are two sites designated nationally for nature conservation within 10km of the site: Boggeragh Mountains NHA and Banteer Ponds pNHA. An assessment of potential source-pathway-receptor links between the subject site and nationally designated conservation sites did not reveal links to either of these sites, therefore no significant effects on Boggeragh Mountains NHA and Banteer Ponds pNHA are anticipated to arise from the proposed works.

5.5.1.2 Habitats

Depositing Lowland Rivers

The proposed works include site clearance, earthworks, drainage, and installation of the runway, taxi-way, drainage trenches, replacement hangar and new air ambulance base. There is potential for run-off of deleterious substances from these works to the surrounding environment. Potential connecting pathways to the Blackwater (Munster) River, which is located adjacent to the northern site boundary, include the drainage ditch at the site, which drains into the Rathcool River c.0.4km to the east of the site, the Rathcool River then flows into the Blackwater (Munster) River a further 0.3km downstream (i.e. a total of 0.6km downstream of the site); there is also potential for overland flow of surface water from the proposed works into the Blackwater (Munster) River.

Overview of Potential Impact Sources and Pathways

Pollutant washout to surface waters during the construction phase: Potential impacts resulting from construction phase works near watercourses are primarily related to three sources of possible water borne pollutants: suspended solids (sediment washout), concrete and hydrocarbons.

The pathways for these pollutants to enter nearby surface waters are via existing drainage ditches and preferential overland flow paths.

- **Suspended Solids:** The principal source of potentially negative impact on aquatic receptors arises from the escape of excessive amounts of suspended solids / sediment during the construction phase. Sediment export can arise from earthworks and/or erosion of soil stockpiles and excavated areas relating to, e.g., excavation for the runway, taxi-way, drainage trenches and new air ambulance base, material stockpiles and hydrocarbon interceptor excavation; it is also proposed to extend the existing runway culvert by approximately 30m to facilitate the new runway alignment. Escaped solids can settle in watercourses, smothering plants and macroinvertebrates, causing fish to abandon the area at least in the short-term. This can result in reduced recruitment of young fish from affected reaches as a result of egg and fry mortalities and displacement of juveniles from nursery areas.
- Elevated concentrations of suspended solids and resulting turbidity within the water column can also potentially damage the gills, physiology and behaviour of fish (e.g.,

respiration, migration) and/or benthic macroinvertebrates (e.g., respiration, drift responses).

- Similar to salmonids, lampreys also depend on clean gravels for spawning, and although lamprey nursery areas depend on marginal sediments, excessive amounts of sediment deposition within a short time period could cause smothering of ammocoetes through loss of oxygen exchange.
- Freshwater pearl mussel is a species that is demanding of pristine water quality conditions and is very sensitive to a range of pollutants. Toxic pollution can have very serious and long-term effects on Margaritifera which, being benthic suspension feeders, are exposed to pollutants in surface water, sediment, interstitial water and through ingestion of filtered particles with sorbed contaminants.
- **Cement:** Owing to its highly alkaline and corrosive nature, cement is potentially toxic to instream fauna and can cause fish and invertebrate kills downstream. Any concrete spills that did enter drains could be transported to the Rathcool River and/or Blackwater River which can result in localised mortality of fish, bivalves and invertebrates if quantities were large enough. Best practice in construction site layout and management means that the risk of wet concrete loss to surface waters is usually very low.
- **Hydrocarbons:** Hydrocarbons from construction sites can emanate from poorly maintained and leaky construction vehicles, mobile plant and cranes and stationery plant such as pumps and generators. Leakage from poorly secured or non-bunded fuel storage areas including spills during re-fuelling of plant and equipment can also occur. Hydrocarbon spills and leakages can result in oil slicks and tainting of fish, or (if large enough) localised fish and invertebrate kills. Loss of hydrocarbons during the construction phase can be prevented / avoided through best practice in construction management.

The Blackwater (Munster) River is part of the Blackwater River (Cork/Waterford) SAC and, at its location in the environs of the site, is known to support freshwater pearl mussel, lamprey species, Atlantic salmon and otter (for further details please refer to the NIS accompanying the planning application). There is potential for elevated levels of turbidity in association with earthworks during the construction phase or release of deleterious substances such as cement or hydrocarbons to temporarily affect the Blackwater River, which may result in likely significant effects on freshwater pearl mussel, lamprey species and Atlantic salmon as a result of degradation of water quality.

Full details on the potential impacts on European sites can be found in the NIS accompanying the Planning Application.

Drainage Ditches

It is proposed to extend the existing runway culvert by c.30m to facilitate the new runway, resulting in a loss of 30m of active drainage ditch and its associated emergent vegetation. In view of the retention of drainage ditches at the site and the widespread presence of this habitat in the wider landscape, this would represent a minor adverse effect at the local geographic scale.

Hedgerows, treelines and earth banks

While the field boundaries comprise distinct habitats under the Fossitt classification scheme, each support trees and shrubs in varying densities and will be considered together within this impact assessment. This will also allow for consistency with Chapter 10: Landscape and Visual.

The Proposed Development will require the removal of approximately 50 trees which form part of hedgerows and earth banks. Species to be removed include Hawthorn, Blackthorn, Oak, Ash, Holly and Willow. The total length of hedgerows and earth banks to be removed is 170 linear metres.

It will also be necessary to pollard trees within the treeline on the eastern site boundary and earth banks running north-south to allow for aircraft to approach the runway. Tree species to be pollarded include Sycamore, Lime, Alder and Ash. A total of 501 linear metres of treeline and vegetated earth bank will require pollarding.

The proposed landscaping plan includes the following:

- Compensatory planting of 702m² of woodland with native species at a rate of 1 per m².
- C.10m of Hawthorn hedgerow to be planted at the existing site entrance (which will be closed up).
- Supplementary planting of Hawthorn, as required, to fill any gaps in the treeline to be pollarded at the eastern site boundary.
- Supplementary planting of Hawthorn on earth banks

During the construction phase, there will be a loss of 170m hedgerow and earth bank habitats in the short term, which would represent a significant adverse effect at the local level. However, with the successful implementation of the landscaping plan, 503m of hedgerows will be enhanced by additional planting and there will be a gain of 702m² of woodland planting with native tree species representing a net gain in woodland habitat within the site in the medium to long term.

Dry Meadows and Grassy Verges

The construction of the proposed development will result in the permanent loss of 32,200m² meadow habitat. The existing closely mown runway will be allowed to revert to longer meadow grassland, resulting in a net loss of 24,457m² meadow grassland that is considered to be Locally Important (Higher Value) as it supports a semi-improved flora. The loss of this area of semi-improved grassland will represent a significant adverse effect within the site but given the retention of the meadow grassland outside of the development footprint and in view of the moderate floral diversity present within the meadow, effects at the local level will be minor.

5.5.1.3 Species

Avifauna

No ground nesting species of bird were recorded during the breeding bird surveys undertaken at the site. Therefore, construction of the new runway, taxiway and helipad will not affect ground nesting birds.

The removal of trees and shrubs within hedgerows and vegetated earth banks and the pollarding of trees would result in a reduction of potential nesting habitat for a range of birds

that are green and amber listed on the BoCCI (see Table 5-6) and the removal of the existing hangar could result in the destruction of Starling nests. If tree and shrub removal and the removal of the hangar is not timed appropriately, nests containing eggs or young chicks could be destroyed.

There is also potential for temporary disturbance of bird species across the site during the construction phase. This would be a temporary significant adverse impact at the local level.

Bats

No bat roosts were recorded within the site, therefore there will be no loss of roosting habitat during the construction phase.

Seven species of bat have been recorded foraging and commuting within the site. Most of the activity was recorded adjacent to the Blackwater River; there will be no requirement for vegetation removal along the banks of the river.

Pipistrelle species and Leisler's bat were the most frequently recorded species along field boundaries at the site, with relatively low numbers of *Myotis* species and brown long-eared bat also recorded. The removal of sections of hedgerow and earth bank habitats has the potential to reduce foraging and commuting habitat for bats. However, in consideration of the wide availability of hedgerows and treelines in the surrounding landscape and with the successful implementation of the landscaping proposals to enhance retained hedgerows and earth banks within the site with native tree and shrub species, it is expected that the removal of sections of earth bank and hedgerow would result in a minor adverse effect on bats at the local level during the construction phase.

Woodland edge and hedgerow habitats provide important flyways and feeding sites for a diversity of bats. Artificial lighting at night may have an adverse effect on foraging bats as light-averse bats may be repelled from lit areas and restrict their use of commuting or feeding space. In the absence of mitigation, disturbance of bats due to lighting used during the construction phase, should it be required, would have an indirect, significant negative effect at the local level. The effect would be temporary and would persist for the duration of construction.

Otter

No evidence of otter holts was recorded within the site or along the banks of the Blackwater River adjacent to the site during the site surveys undertaken in 2024, therefore there will be no direct effects on otter. However, otter create new holts regularly, and there is potential for otter to create a breeding or resting place along the banks of the Blackwater River. The potential for disturbance to the breeding or resting place for otter during the construction phase, should they create a new holt within 150m of the proposed works, cannot be excluded. This would be a significant adverse effect at the local level.

Badger

No evidence of badger setts within the site was recorded during the course of the site surveys undertaken in 2024, therefore there will be no direct effects on badgers. However, badgers create new setts regularly, and the site provides suitable habitat for sett excavation in earth banks at the site. Direct impacts effects on badgers are therefore possible should badgers

establish setts in hedge banks adjacent to or within areas of construction. This would be a temporary significant adverse impact at the local geographic scale.

Invasive Species

No invasive species were recorded at the site. Therefore, the proposed works are not expected to result in the spread of invasive species.

5.5.2 Operational Phase

The ecological features that, in the absence of mitigation, may potentially be affected by the operational phase of the Proposed Development and the significance of these effects are set out in the following sections.

5.5.2.1 Designated Sites

Potential impacts on European Sites during the operational phase are considered in the Natura Impact Statement accompanying the Planning Application.

No significant adverse impacts on nationally designated sites are anticipated to arise during the operational phase.

5.5.2.2 Habitats

Depositing Lowland Rivers

The availability of suitable freshwater pearl mussel habitat is largely determined by flow (catchment geology being the other important factor). In order to restore the habitat for the species, flow variability over the annual cycle must be such that: 1) high flows can wash fine sediments from the substratum, 2) low flows do not exacerbate the deposition of fines and 3) low flows do not cause stress to mussels in terms of exposure, water temperatures, food availability or aspects of the reproductive cycle¹².

As detailed in Chapter 7: Hydrology, the proposed new location of the HSE Air Ambulance hanger, paramedic prefab base, crew prefab base and new proprietary wastewater treatment system do not fall within Flood Zone 'A' or Flood Zone 'B', and therefore fall within Flood Zone 'C'. The proposed finished floor level of the buildings is above the estimated 0.1% AEP flood level of 82.1m OD in the River Blackwater.

The proposed runway and taxiway will be constructed at existing ground levels and will not involve any significant infilling or ground level raising. The proposed runway and taxiway will therefore have no adverse impact on overland flow conveyance paths or the existing hydrological regime of fluvial flood waters associated with the River Blackwater. In addition, surface water runoff from the hard-standing runway shall be collected and attenuated on site in an underground infiltration system and will not result in an increased fluvial or pluvial flood risk elsewhere.

It is proposed to extend the existing culvert under the existing runway by approximately 30m to accommodate the proposed runway alignment. It is also proposed to construct a 900mm pipe culvert under the proposed runway along the field drain in the western area of the site. The proposed culverts fall within an OPW NIFM 1% AEP (1 in 100 year – Flood Zone 'A') and

¹² [Site specific cons obj \(npws.ie\)](http://Site_specific_cons_obj(npws.ie))

a 0.1% AEP (1 in 1000 year – Flood Zone ‘B’) associated with the River Blackwater. These culvert structures shall be constructed below existing ground levels and are therefore unlikely to result in any adverse impact to the exiting hydrological regime of the area during the occurrence of an extreme fluvial event in the River Blackwater.

In summary, the proposed runway and taxiway will have no adverse effect on overland flow conveyance paths or the existing hydrological regime of fluvial flood waters associated with the River Blackwater; and the proposed development will not result in increased fluvial or pluvial flood risk elsewhere.

During the operational phase, surface water run-off from the runway will be managed by filter strips, filter drains and conveyance of storm water to attenuation systems via hydrocarbon separators. Run-off from the air-ambulance base will pass through a silt trap to a soakaway and run-off from the concrete apron and heli-pad will pass through a full retention hydrocarbon separator to a soakaway.

Foul water will be treated by a tertiary treatment system and infiltration/ treatment area.

In view of the proposed surface water management features, no adverse effects on surface water quality or the quality of groundwater draining into the Blackwater River are anticipated during the operational phase.

The navigation light corridor proposed for the development will increase light levels within the proposed development area. Artificial lighting at night may have an adverse effect on aquatic species within the river. The proposed lighting of the runway is limited to 18 no. runway edge lights plus threshold lights at each end of the runway, all of which are designed to mark the runway but not the area around the runway. The lux measurement at a distance of 10m from the runway will be 0.65lux, which is within the range of lux levels to be expected during a night with a clear full moon. As such, there will be no significant light spill onto valuable aquatic habitats within the Blackwater River, located c.35m from the proposed runway at its closest point. The helipad will be lit by 12 no. green lights and the taxiways will both be lit by 8 no. blue lights; the helipad and taxiways are located to the south of the proposed runway and will not result in light spill onto the Blackwater River. Further, air ambulance services do not operate after the hours of darkness. The proposed development would facilitate the air ambulance service to land after the hours of darkness at Rathcool when required, however it is projected that the number of times that lighting will be used to facilitate a helicopter landing will be limited to 4 to 6 times a year. No nighttime flying will be undertaken by Rathcool Flying Club. In view of these factors, no significant adverse effects on aquatic species as a result of artificial lighting at night are expected.

No potential for significant adverse effects on Blackwater (Munster) River have been identified during the operational phase.

Drainage Ditches

No potential for significant adverse effects on drainage ditch habitat during the operational phase has been identified.

Hedgerows, treelines and earth banks

During the operational phase, it is expected that the tree and shrub species planted as part of the landscaping plan will become established and will enhance the hedgerow network present at the site and its connectivity within the landscape in the medium to long term.

Dry Meadows and Grassy Verges

As the existing runway reverts to meadow habitat cut once a year (as per the current management regime for the grassland), it is expected that the effect on meadow habitat during the operational phase will be neutral.

5.5.2.3 Species

Avifauna

Aircraft can pose a risk of adverse effects on avifauna as a result of bird strike. Data collected by the Civil Aviation Authority (UK) between 2017 and 2021 showed that gulls were most at risk from bird strike, followed by swallows and pigeons. However, it is noted that most accidents occur where birds strike against a windscreen or get sucked in to the engine of jet craft; the latter is not an issue with the light aircraft and helicopters that will use the site.

No gulls were recorded within the site during the breeding bird surveys completed in 2024, therefore there is no risk of an increase in mortality rate of gulls as a result of an increase in aircraft at the site during the operational phase. Most of the bird species recorded at the site were observed in association with hedgerows, treelines, conifer plantation and riparian habitat present away from the runway. However, Swallow nests on the club house building at the site and were observed occasionally foraging over the existing runway. There is potential for the mortality rate of Swallow, a species of Moderate Conservation Concern (i.e. Amber listed on the BoCCI) to rise with an increase in air traffic. However, in view of the characteristics of the aircraft using the aerodrome, i.e. light aircraft and helicopters rather than jets, it is considered that the risk of impacts on Swallow as a result of bird strike would be low and would be limited to a slight adverse effect at the local level.

Bats

Seven species of bat have been recorded foraging and commuting within the site.

As noted in Section 5.5.1.3, woodland edge and hedgerow habitats provide important flyways and feeding sites for a diversity of bats. The navigation light corridor proposed for the development will increase light levels within the proposed development area. Artificial lighting at night may have an adverse effect on foraging bats as light-averse bats may be repelled from lit areas and restrict their use of commuting or feeding space. However, the proposed lighting of the runway is limited to 18 no. runway edge lights plus threshold lights at either end of the runway, all of which are designed to mark the runway but not the area around the runway. The lux measurement at a distance of 10m from the runway will be 0.65lux, which is within the range of lux levels to be expected during a night with a clear full moon. As such, there will be no significant light spill on to important bat habitat along the riparian corridor of the Blackwater River, located c.35m from the proposed runway at its closest point, or hedgerows present at the site. The helipad will be lit by 12 no. green lights and the taxiways will both be lit by 8 no. blue lights; the helipad and taxiways are located to the south of the proposed runway and will not result in light spill onto the Blackwater River. Further, air

ambulance services do not operate after the hours of darkness. The proposed development would facilitate the air ambulance service to land after the hours of darkness at Rathcool when required, however it is projected that the number of times that lighting will be used to facilitate a helicopter landing will be limited to 4 to 6 times a year. No nighttime flying will be undertaken by Rathcool Flying Club. In view of these factors, no significant adverse effects on bats as a result of artificial lighting at night, or collision with helicopters and light aircraft are expected.

Otter

No otter holts were recorded at the site and its immediate environs, therefore there will be no disturbance to otter breeding or resting sites during the operational phase.

As detailed above, the requirement for lighting of the runway will be limited to very occasional use and no light spill will occur to riparian habitat along the Blackwater River. No significant adverse effects on otter due to light spill will occur during the operational phase.

As described previously, in view of the proposed surface water management features, no adverse effects on surface water quality or the quality of groundwater draining into the Blackwater River are anticipated during the operational phase. As such, no adverse effects on water quality and, in turn, potential foraging resources for otter are expected to occur during the operational phase.

Badger

No badger setts were recorded at the site and its immediate environs, therefore there will be no disturbance to badger during the operational phase.

Invasive Species

No invasive species were recorded at the site. Therefore, the Proposed Development is not expected to result in the spread of invasive species during the operational phase.

5.5.3 Potential Cumulative Impacts

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. A search of Cork County Council planning enquiry system was conducted for developments that may have in-combination effects on ecological features with the Proposed Development at Rathcoole Aerodrome. Based on this search, a list of those projects which may potentially contribute to cumulative or in-combination effects with the Proposed Development at Rathcoole Aerodrome was generated, as listed in Table 5-10.

Table 5-10: Other Projects and Plans that could result in potential cumulative impacts

Plan / Programme/Policy	Key Objectives/Policies/Proposals	Potential for In-combination Effects and Mitigation
Cork County Development Plan 2022	The Cork County Development Plan includes the following Objectives of relevance to this report: BE 15-2: Protect sites, habitats and species: a) Protect all natural heritage sites which are designated or proposed for designation under European legislation, National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages	Policies and objectives of the Cork County Development Plan 2022 ensure that local planning applications comply with proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations, there is no potential for adverse in-

	between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites. These sites are listed in Volume 2 of the Plan. b) Provide protection to species listed in the Flora Protection Order 2015, to Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2 of the Plan. c) Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan. d) Recognise the value of protecting geological heritage sites of local and national interest, as they become notified to the local authority, and protect them from inappropriate development e) Encourage, pursuant to Article 10 of the Habitats Directive, the protection and enhancement of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species. BE 15-6: Biodiversity and New Development: Provide for the protection and enhancement of biodiversity in the development management process and when licensing or permitting other activities by: a) Providing ongoing support and guidance to developers on incorporating biodiversity considerations into new development through preplanning communications and the Council's guidance document 'Biodiversity and the Planning Process – guidance for developments on the management of biodiversity issues during the planning process' and any updated versions of this advice; b) Encouraging the retention and integration of existing trees, hedgerows and other features of high natural value within new developments; c) Requiring the incorporation of primarily native tree and other plant species, particularly pollinator friendly species in the landscaping of new developments;	combination or cumulative effects on biodiversity.

	d) Fulfilling Appropriate Assessment and Environmental Impact Assessment obligations and carrying out Ecological Impact Assessment in relation to development and activities, as appropriate; e) Ensuring that an appropriate level of assessment is completed in relation to wetland habitats subject to proposals which would involve drainage or reclamation. This includes lakes and ponds, watercourses, springs and swamps, marshes, heath, peatlands, some woodlands as well as some coastal and marine habitats; f) Ensuring that the implementation of appropriate mitigation (including habitat enhancement, new planting or other habitat creation initiatives) is incorporated into new development, where the implementation of such development would result in unavoidable impacts on biodiversity - supporting the principle of biodiversity net gain.	
Water Action Management Plan 2024	The Water Action Plan includes targeted measures for all water bodies, with the objective of either protecting water bodies at good or high status or restoring water bodies to at least good status. Where further specific measures are needed in addition to those set in this plan, integrated catchment planning approaches will be used to identify and decide on further specific measures for each water body. This will be reported in 46 Catchment Management Work Plans. These will be used to locate measures within each catchment. The list of water bodies and their associated status, significant pressures/issues and targeted measures, which are to be included in the Catchment Management Work Plans, will include targets for the third-cycle, along with Key Performance Indicators to monitor progress and outcomes.	The implementation and compliance with key environmental policies, issues and objectives of this management plan will result in positive in-combination effects to European sites. The implementation of this plan will have a positive impact for the biodiversity. It will not contribute to in-combination effects with the proposed development.
Uisce Éireann Capital Investment Plan 2020-2024	Proposals to upgrade and secure water services and water treatment services countrywide.	Likely net positive impact due to water conservation and more effective treatment of water.
WWTP discharges	Millstreet and Environs Banteer and Environs	Discharges from municipal WWTPs are required to meet water quality standards. Irish Water Capital Investment Plan 2020-2024 proposes to upgrade water treatment services countrywide. The long-term in-combination impact is predicted to be negligible.
IPPC Programme	ALPS Electric (Ireland) Ltd (P0835), located c.7.9km to the south-west of the site	Discharges from these facilities are governed by strict limits to ensure compliance with quality standards. The long-term in-combination impact is predicted to be negligible.

Residential Applications Under consideration	A search was conducted of planning applications (projects) within the vicinity of the proposed development, using the Cork County Council planning portal map viewer¹³. The search was limited to the five -year period preceding the date of issue of this report, and excluded retention applications (i.e. typically local-scale residential or commercial developments where an impact has already occurred), incomplete, withdrawn, and refused applications. Local planning applications in proximity and within the zone of influence of the proposed development are limited to a GAA sports facility (Ref: 236233), extension to dwelling (Ref: 235624), dwelling house (Ref: 245380 & 196001) and small agricultural development (Ref: 204802).	Adherence to the overarching policies and objectives of the Cork County Development Plan 2022 - 2028 ensure that local planning applications and subsequent grant of planning comply with the core strategy of proper planning and sustainability and with the requirements of relevant EU Directives and environmental considerations, there is no potential for adverse in combination or cumulative effects on biodiversity.

5.5.4 “Do Nothing” Impact

In the absence of the Proposed Development, the aerodrome and air ambulance base would continue to operate. The habitats present at the site would be retained and would likely support a similar range of species as recorded within the baseline of this EIAR chapter.

5.6 Avoidance, Remedial & Mitigation Measures

5.6.1 Construction Phase

5.6.1.1 General

The control measures for the Proposed Development will follow the following current best practice guidelines:

- H. Masters-Williams et al (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA;
- Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016); and
- Murnane et al (2002) Control of Water Pollution from Construction Sites- Guide to Good Practice. SP156.

The Contractor, appointed by Rathcool Flying Club, shall be required to comply with and implement the requirements and mitigation measures as set out here and incorporated in full in the CEMP (Waterman Kelly, 2024) and any conditions or restrictions imposed as part of the granted planning approval.

Supervision

- Rathcool Flying Club shall appoint a suitably qualified person(s), to the role of Environmental Clerk of Works (EnCoW). The role of the EnCoW will be to monitor the construction works, appoint the relevant specialists required and to ensure compliance with relevant legislation, planning conditions, to ensure the implementation of the mitigation measures in the planning approval as may be granted;

¹³[Amharcóir Pleanála - Planning Viewer \(arcgis.com\)](https://amharcoir.pleanala.ie/PlanningViewer.aspx)

- The EnCoW shall have the authority to advise the Contractors and all site staff on the contract/project requirements, decide on elements that require direct supervision and instruct action, as appropriate, including the authority to require the temporary cessation of works where necessary, and to ensure the implementation of the mitigation measures in the planning approval as may be granted; and
- The EnCoW shall have the authority to advise the Contractors and all site staff to ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required, and the Contractor is required to prepare a contingency plan for before and after such events.

The following mitigation measures outlined in Table 5-11 shall be implemented in full by the appointed contractor.

Table 5-11: Table of Construction Phase Mitigation Measures

Ecological Feature/ Objective(s)	Measure	Details of Mitigation
Control of Sediment Loss	Best Practice during Construction (Specific Silt Control Measures)	Any surface vegetation and spoil removed during site clearance shall be retained in an area over 20m away from any watercourse or active drainage ditch. The spoil must be surrounded by a silt fence and preferably placed on a well vegetated area. In very heavy rain, provision for covering of the stockpile with geotextile should be made. Surplus soil should be removed or re-used on site and immediately re-seeded.
Control of Sediment Loss	Best Practice during Construction (Specific Silt Control Measures)	No vegetation clearance shall take place within 10 meters of the riparian corridor with the Blackwater River. There shall be no instream works and no machinery shall be permitted to enter the Blackwater River at any point during the proposed project.
Control of Sediment Loss	Best Practice during Construction (Specific Silt Control Measures - Drains)	Culverting of the drainage ditches under the new runway shall be undertaken during a period of low flow. The drainage ditches shall have a series of temporary check-dams installed in advance of construction works to slow run-off velocity and prevent excessive sediment run-off from the site. These shall be a series of stake & geotextile dams backed up with gravels. A careful site drainage audit shall be carried out to identify any shallow drains / depressions and preferential flow paths from the works area towards the Blackwater River or active drainage ditches. Depressions/ preferential flow paths shall be fitted with e.g., cut-off drains/structures, geo-textile and stake and/or staked down strawbale silt traps that will intercept and slow water velocity, encourage dispersal of flows and settlement of silt prior to meeting the interface with the river or check-dams in the drainage ditch. Any sediment/silt-traps, and check dams necessary to control run-off will be regularly checked, maintained, cleaned and/or replaced, if necessary, during the construction phase.
Avoid loss of contaminated material or leachate to the Blackwater River	Best Practice during Construction (Contaminated Materials)	Prior to undertaking any works on site, a silt fence will be erected adjacent to the bank of the Blackwater River (as illustrated in the CEMP) to intercept any silt and contamination laden runoff from excavated areas that may arise during heavy rainfall. The silt fence shall be maintained until excavation has been completed and vegetation is well established on topsoiled areas and the risk of silt laden runoff entering the river is minimised. The extent of the silt fence is shown within the CEMP included as part of the planning application.

		The efficacy of the silt fence shall be monitored daily and a second silt fence erected as required to avoid or reduce mobilisation of sediment into the river.
Control of Sediment Loss	Best Practice during Construction – Sediment	There must be no discharge of suspended solids or any other deleterious matter to the drainage channels within the site or the Blackwater River during the construction phase. Any silt contaminated water from the works area must be treated prior to discharge. If dewatering is required after heavy rain from e.g., excavated areas, contaminated water must be treated prior to discharge. The Contractor shall employ best practice settling systems to ensure maximum removal of suspended solids prior to discharge of any surface water or groundwater from excavations to receiving waterbodies. This may include treatment via settlement tanks; settlement tanks shall be used in preference to settlement ponds to avoid the risk of affecting natural flow regimes. There must be no direct pumping of silt/sediment laden water from the works area to drains or an active watercourse at any time.
Avoid Hydrocarbon Loss to Water	Best Practice during Construction (Hydrocarbons)	Temporary parking and refuelling areas shall be within a designated area within and adjacent to the construction compound. As illustrated within the CEMP accompanying the planning application, these areas are at the south of the site and are over 150m away from watercourses and drains. Best practice for hydrocarbon use and storage will be followed as set out in Section 4.2.2 of the CEMP.
Avoid loss of concrete to water	Best Practice during Construction (Concrete)	Best practice for concrete use, disposal and wash down will be followed as set out in Section 4.2.4 of the CEMP.
Hedgerows	Timing	No clearance of hedgerows on site shall occur during the bird breeding season from 1st March to 31st August. The removal of hedgerows, considered to be Locally Important (Higher Value) shall be kept to a minimum and loss of hedgerow shall be compensated for by a planting scheme comprising native species as described in Chapter 10: Landscape and Visual. The hedgerow planting shall link to other linear habitats (hedgerows, treelines and watercourses) to provide connectivity to the wider landscape. Any existing mature trees adjacent to construction areas to be retained will be protected from any accidental damage during construction through use of measures such as fencing. Protective fencing barriers will be installed as outlined in Section 6.2, Barriers and Ground Protection, of BS 5837.
Meadows	Re-establishment	The existing air ambulance base will be dismantled and the area topsoiled over. The topsoil will be seeded with native grass seed and managed with the surrounding grassland as a meadow.
Avifauna	Timing of works	No clearance of hedgerows or other removal of vegetation on site shall occur during the bird breeding season from 1st March to 31st August. The hangar supports breeding Starling and shall be dismantled outside of the bird breeding season from 1st March to 31st August.
Bats	Best Practice Felling	No potential roosting features were recorded during the site survey. However, as a precaution and in accordance with best practice, pre-construction Potential Roost Feature (PRF) inspection/presence absence surveys of all trees scheduled for felling or pollarding shall be undertaken. Following this examination, should any of the trees be identified as a

		bat roost then a derogation licence application will be made to the NPWS to exclude the bats and fell the tree. Where bats are recorded roosting in the trees scheduled for felling, the following mitigation will be required: • Timing: tree-felling can be undertaken from late August to late October/early November and all works should ideally be undertaken in this period. During this period bats are still capable of flight having not entered hibernation and undertaking works in this period may reduce the risks of tree-felling if proper measures are undertaken. To carry out the works any later in the bat season creates an additional risk that bats may be in hibernation and thus unable to fly out from a tree that is being felled, although bats can be removed by hand by a licenced bat handler if required. Additionally, disturbance during winter may reduce the likelihood of survival as the bats' body temperature is too low and they may have to consume too much body fat to survive. Trees to be felled under the supervision of the bat specialist (as identified during the pre-construction survey) will be examined and where bats are found, they will be translocated to an area where bat boxes will already be installed on appropriate trees within the site. The proposed process for felling the trees with PRFs is outlined below: • The bat specialist will be present during the tree felling works; • Works will be undertaken in mild weather to ensure that if bats are found during works that they can be released or safely removed; • Tree(s) identified as having potential to support bats will be surveyed during the daytime for bats prior to felling, on the day the felling is due to take place. The bat specialist will inspect all potential bat roost features of the tree, including those above ground level. This will require the services of a qualified arborist to climb the trees/ use a cherry picker and fell the tree in sections and lower potential roost features slowly to the ground to allow the bat specialist to inspect them. This will include visual inspection as well as use of an endoscope to inspect cavities/crevices; • The arborist will be briefed on the technique to be followed prior to the commencement of operations. Felling will follow best practice and mitigation measures, including wedging open cracks/crevices prior to load removal and cutting limbs in sections and lowering to the ground. Trees will only be felled in longer sections if the bat worker is satisfied that there are no potential roost features present; • When using a chainsaw, the rate of fall of branches will not be accelerated by the use of a chain and vehicle;

		- Any bats found in the trees will be removed by hand to a bat box and will then be relocated to the bat boxes installed in advance of works. Notes of any such activities will be maintained; - The tree and/or tree sections will be left on the ground for a minimum period of 24 hours to enable any unidentified bats residing in deeper crevices to make good their escape during night time hours.
Bats	Lighting	To minimise disturbance to bats and other fauna that are active at night, construction operations during the hours of darkness should be kept to a minimum. In circumstances where, during the bat activity period (April to September), daylight hours stretch beyond the likely permitted hours of operation on site, there will be no requirement for lighting to be used on the site during this period.
Badger	Pre-construction survey	No evidence of badger setts within the site was recorded during the site surveys undertaken in 2024. However, badgers create new setts regularly, therefore a pre-construction survey shall be undertaken prior to the commencement of construction to identify active badger setts occurring within the site. In the event of badger setts being identified within proximity to the proposed works area, the following mitigation measures are proposed to ensure no disturbance of the local badger population during the construction phase of the proposed works (NRA 2009): - A buffer distance of 10m from sett entrances should be employed in instances where light works such as digging by hand or in the event of scrub clearance. - A buffer distance of 20m from Badger sett entrances should be incorporated where light machinery (generally wheeled vehicles) are in operation within the site. - A buffer distance of 30m from Badger setts should be employed where heavy machinery is in operation within the site. - None of the above activities should be undertaken within 50m of active setts during the breeding season (1st December to 31st June inclusive). In the unforeseen event that the project requires works to be undertaken within the recommended buffer distances outlined above, further measures as outlined in NRA (2009) will be adopted in liaison with local NPWS staff.
Otter	Pre-construction survey	Pre-construction otter surveys shall be undertaken prior to the commencement of any works in order to identify any changes in otter activity and holt locations since surveys for this report were completed to address possible impacts on otters. It is also important to ensure that no new holts have been created in the intervening period. This shall be conducted by a suitably qualified ecologist No otter holts have been recorded within 150m of the proposed development to date, therefore a derogation license for otters is not required at this time. However,

		in the event that otter holts are recorded at the site during pre-construction surveys, the removal of otters from affected holts, and the subsequent destruction of these holts, can only be conducted under a Section 25 derogation under the 1997 Habitats Regulations. Derogations are also required for any works likely to cause disturbance to active breeding holts (when present within c.150m of a scheme). The National Parks and Wildlife Service (NPWS), of the Department of the Environment, Heritage and Local Government, is responsible for processing these licenses. If otter holts are recorded on site, an application for a Section 25 derogation shall be submitted to the NPWS along with the relevant ecological information from otter surveys. Closure of holts requires a monitoring period to ensure that there is no current otter activity at the holt. Derogations may not be provided by the NPWS for the closure of holts containing a breeding female or young otters. In the event of otter holts being identified within proximity to the proposed works area, the following mitigation measures shall take place to ensure no disturbance of the local otter population during the construction phase of the proposed works (NRA 2008): ▪ No works shall be undertaken within 150m of any holts at which breeding females or cubs are present. Following consultation with NPWS, works closer to such breeding holts may take place – provided a derogation licence and appropriate mitigation measures are in place, e.g. screening and/or restricted working hours on site. ▪ No wheeled or tracked vehicles (of any kind) shall be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance shall not take place within 15m of such holts, except under licence. ▪ The prohibited working area associated with otter holts will be fenced with temporary fencing prior to any possibly invasive works. Appropriate awareness of the purpose of the enclosure shall be conveyed through notification to site staff and sufficient signage shall be placed on each exclusion fence. All contractors or operators on site shall be made fully aware of the procedures pertaining to each affected holt.
Invasive Species	Best Practice (Invasive Plant Species)	No invasive species were identified on site during the site walkovers. However, in line with best practice, the following measures shall be undertaken: ▪ Undertake further invasive species survey prior to the commencement of construction. ▪ In the event that any such species are identified an Invasive Species Management Plan shall be prepared and implemented by the Contractor. This shall include plant specific control measures for any invasive species identified. ▪ Biosecurity measures shall be undertaken to prevent the importation of invasive species from contaminated areas into the study area. ▪ For any material entering the site, the supplier shall provide an assurance that it is free of invasive species.

		▪ Machinery or plant to be inspected upon arrival and departure from site and cleaned when necessary. ▪ Ensure all site users are aware of invasive species management plan and treatment methodologies. This can be achieved through “toolbox talks” before works begin on the site. ▪ Adequate site hygiene signage shall be erected in relation to the management of non-native invasive species material.

5.6.2 Operational Phase

No potential for significant adverse effects has been identified during the operational phase, therefore no specific mitigation measures are required.

5.6.3 “Worst Case” Scenario

In the event that the mitigation measures provided in Section 5.6 fail, there is potential for degradation of water quality within Blackwater (Munster) River and subsequent effects on protected aquatic species including freshwater pearl mussel, lamprey species and Atlantic salmon. There is potential for disturbance impacts on avifauna, otter and badger and loss of foraging habitat for bats; in the absence of appropriate landscaping proposals, there is also potential for loss of meadow habitat and hedgerows.

5.7 Residual Impacts

A summary of residual impacts is presented in Table 5-12 below.

Table 5-12: Summary of residual impacts, Development at Rathcoole Aerodrome

Ecological Features	Residual Impacts
Habitats and Flora	Hedgerows and treelines are considered to be of local importance (higher value) given their value to wildlife and biodiversity. It is estimated that approximately 170m of hedgerows/ treelines will be removed to accommodate the new runway and new site entrance. However, the landscaping proposals include the enhancement of approximately 503m of existing hedgerows at the site using native hedgerow species and new compensatory planting of 702m² woodland using native tree and shrub species from native stock. It is estimated that 24,457m² meadow habitat will be removed to facilitate the proposed development resulting in a minor effect at the local level. 30m of drainage ditch habitat and its emergent vegetation will be culverted, resulting in a minor adverse residual effect at the site level. The successful implementation and establishment of landscaping proposals for this development will result in a positive impact on woodland habitat within the site over the medium to long term.
Fauna	In the absence of mitigation, the proposals have the potential to impact on protected/notable species, through loss of habitat, damage to habitat and potential disturbance during the construction phase.

Ecological Features	Residual Impacts
	However, with the successful implementation of landscaping proposals for the site and the specific mitigation measures outlined in Section 5.6, it is anticipated that residual impacts will be limited to a slight adverse effect on foraging Swallow as a result of collision risk and foraging and commuting bats at the local level as a result of commuting and foraging habitat loss. No significant adverse residual impacts to fauna are anticipated. Landscaping proposals will enhance c.503m of the existing hedgerows and will provide a net gain of approximately 702m² woodland habitat. These proposals will provide foraging, commuting and shelter for mammals, birds and invertebrates and an enhanced ecological network; as such this is expected to have a positive impact over the medium to long term.

5.8 Monitoring

5.8.1 Construction Phase

Pollution Prevention

The aim of monitoring is to alert personnel to any increase in threat to aquatic QI species and, in particular, freshwater pearl mussel so that timely mitigation may be deployed as appropriate, and to assess the effectiveness of mitigation already in place. Monitoring shall include inspection and photographic records of potential pathways for pollutants to reach and impact on freshwater pearl mussel populations. Effective monitoring with well documented results will aid in auditing and revising emergency response plans.

A biological and chemical monitoring system will be put in place on the Blackwater River and the drainage ditch within the site. As a minimum the monitoring system will measure turbidity, suspended solids, phosphorus, BOD/ dissolved oxygen & pH on the Blackwater River upstream and downstream of the area of the site situated adjacent to the Blackwater River (Monitoring Sites A and B, Figure 5-5) and within the drainage ditch upstream and downstream of the location of the new runway (Monitoring Sites C & D, Figure 5-5).

The details of the monitoring system, including duration, frequency of sampling, monitoring locations, and parameters to be monitored will be agreed in advance with Inland Fisheries Ireland and the National Parks & Wildlife Service. Chemical analysis will be carried out only at laboratories that have been accredited by EPA for the analyses to be carried out.

Figure 5-5: Water quality monitoring sites



Habitat Restoration

Hedgerow planting shall be monitored for 60 months after the date of completion of all of the initial planting works. Throughout the aftercare period, all shrub planting areas will be weeded regularly. An area of 1m diameter will be kept clear around each planted tree to help ensure the early establishment. A minimum of 3-visits per growing season will be required to keep injurious weeds under control. The growth of herbaceous material between the weeded areas will be controlled by twice yearly strimming. All stakes and trees shall be maintained in firm positions within the ground and all ties securely fixed and adjusted to allow for the increase in stem girth. Plants that fail to thrive will be removed and replaced with equivalent plants as soon as possible during the following planting season.

5.8.2 Operational Phase

No monitoring requirements have been identified for the operational phase.

5.9 Interactions

Biodiversity interacts with a number of chapters within the EIAR including:

- Chapter 7 Hydrology: The hydrology of the site when assessing the potential impacts of the proposed development on natural hydrological processes of the Blackwater (Munster) River. The Biodiversity Chapter has had regard to the assessment of hydrological processes enclosed within Chapter 7: Hydrology.

- Chapter 11 Landscape and Visual: Biodiversity also interacts with the landscape, particularly when considering the impacts of habitat loss and the habitat gain built into the landscaping design. The Biodiversity Chapter has had regard to Landscape and Visual assessment enclosed within Chapter 11.

5.10 Difficulties Encountered When Compiling

All surveys were conducted within the optimal survey period in appropriate weather conditions. No constraints to the survey information gathered or difficulties when compiling this Biodiversity Chapter are noted.

5.11 References

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6 LAND AND SOIL

6.1 Introduction

This chapter provides a description of the land, soils and geology within and immediately surrounding the site of the Proposed Development, an assessment of the potential impacts of the Proposed Development on land, soils and geology and sets out any required mitigation measures where appropriate.

The principal objectives of this chapter are to identify:

- Land, soils, and geological characteristics of the receiving environment at the site.
- Potential impacts that the Proposed Development may have on land, soils and geology including “worst case” scenario assessment.
- Potential constraints that the environmental attributes may place on the Proposed Development.
- Required mitigation measures which may be necessary to minimise any adverse impacts related to the Proposed Development.

This chapter of the EIAR should be read in conjunction with Chapter 4 Population and Human Health, Chapter 5 Biodiversity, Chapter 7 Hydrology and Hydrogeology, Chapter 8 Air Quality, Chapter 11 Landscape and Visual Impact, Chapter 12 Material Assets: Traffic and Transport, and Chapter 13 Material Assets: Waste and Utilities of the EIAR and other information provided by the Applicant pertaining to the design proposals for the Proposed Development

6.1.1 Quality Assurance and Competency of Experts

This chapter of the EIAR has been prepared by Gareth Carroll BA, BEng, MEnvSc, CEnv a Principal Consultant of Enviroguide (now DNV) with over 11 years’ experience of environmental assessment of brownfield and greenfield sites. This chapter was reviewed by Patrick Higgins BSc, MSc, MEnvSc, CEnv who is Technical Director of the Contaminated Land and Hydrogeology Division of Enviroguide (now DNV) and has over 18 years’ experience in preparing environmental assessments for a range of project types and geological and hydrogeological site settings.

6.2 Study Methodology

6.2.1 Relevant Legislation and Guidance

The methodology adopted for the assessment will take cognisance of relevant guidelines, in particular the following:

- S.I. No. 92 of 2011- European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment including amendments S.I. No. 52 of 2014.
- S.I. No. 98 of 2008- European Parliament and of the Council on waste and repealing certain Directives including amendments Directive (EU) 2018/851.
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

- Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide (IGI, 2002).
- Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements (IGI, 2013).
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009).
- Cork County Council, 2022. Cork County Development Plan 2022-2028.

6.2.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with the Environmental Protection Agency (EPA) and Institute of Geologists of Ireland (IGI) guidelines as set out above and is described in the following sections.

Element 1: An assessment and impact determination stage was carried out by Enviroguide (now DNV) to establish the project location, type and scale of the development, the baseline conditions, and the type of land, soils and geological environment, to establish the activities associated with the Proposed Development and to undertake an assessment and impact determination. This element of the assessment also included developing the Conceptual Site Model (CSM) for the Site and receiving environment.

The study area, for the purposes of assessing the baseline conditions for the Land, Soils and Geology Chapter of the EIAR, extends beyond the site boundaries and includes potential receptors with which there may be a pathway to/from the Proposed Development and receptors that may be indirectly impacted by the Proposed Development. The extent of the wider study area was based on the IGI, 2013 Guidelines which recommend a minimum distance of 2.0km from the Site.

The desk study involved collecting all the relevant data for the Proposed Development site and surrounding area including published information and details pertaining to the Proposed Development provided by the applicant and design team.

The Element 1 stage of the assessment was completed by Enviroguide (now DNV) and included the review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping 2024 (EPA, 2025).
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater webmapping, 2024 (GSI, 2025).
- Google Earth Mapping and Imagery, 2024 (Google Earth, 2024).
- Ordnance Survey Ireland (OSI) webmapping, 2024 (OSI, 2024).
- National Parks and Wildlife Services (NPWS) webmapping, 2024 (NPWS, 2024).
- Teagasc webmapping, 2024 (Teagasc, 2024).
- Information provided by the Applicant pertaining to the design proposals for the Proposed Development.
 - Intrusive ground investigations including trial pitting was undertaken by O’Riordan Architectural and Building Services Ltd. in March 2022 as part of the site characterisation assessment for the proposed onsite wastewater treatment system (OSWTS) and by Clement O’Sullivan Engineering Design Solutions Ltd. in July 2024 as part of the proposed stormwater drainage design. The

results of the site investigations were used to identify and assess the existing ground conditions and geological environment at the site. The site characterisation assessment report is included in Volume 3 Appendix 6-1 of this EIAR and the Stormwater Design Report is included in Volume 3 Appendix 6-2 of this EIAR.

Element 2: Based on a review of the information compiled and reviewed in Element 1, it was determined that there was sufficient information including site investigation data regarding the Proposed Development and the subsurface and geological conditions at the site to inform the impact assessment of the Proposed Development Site on the receiving land, soil, and geology environment

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 of the assessment. Mitigation measures to address all identified adverse impacts that were identified in Element 1 of the assessment were considered in relation to the construction phase and operational phase of the Proposed Development. These mitigation measures were then considered in the impact assessment to identify any residual impacts.

Element 4: Completion of the Land, Soil and Geology sections of the EIAR in this Chapter which includes all the associated figures and documents.

6.2.3 Description of Importance of the Receiving Environment

The Transport Infrastructure Ireland (TII) criteria for rating of the importance of geological features at the Site as documented in the National Roads Authority Guidelines (NRA, 2009), are summarised in Table 6-1.

Table 6-1. Criteria for Rating Site Importance of Geological Features

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

Importance	Criteria	Typical Example
Low	Attribute has a low quality, significance, or value on a local scale. Degree or extent of soil contamination is minor on a local scale. Volume of peat and/or soft organic soil underlying route is small on a local scale.	Large historical and/or recent site for construction and demolition wastes. Small historical and/or recent landfill site for construction and demolition wastes. Poorly drained and/or low fertility soils. Uneconomically extractable mineral resource.

6.2.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter is described in Table 6-2 in accordance with EPA, 2022 guidelines on the information to be contained in EIARs.

Table 6-2. Assessment of Potential Terminology and Methodology

Type of Effect	Definition
Quality of Effects/ Impacts	Definition
Negative	A change which reduces the quality of the environment
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment
Significance of Effects / Impacts	Definition
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	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	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 a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.
Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less
Short-term	Effects lasting one to seven years

Type of Effect	Definition
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration
Brief	Effects lasting less than a day

6.3 The Existing and Receiving Environment (Baseline Situation)

6.3.1 Site Location and Description

The site of the Proposed Development is located at Rathcool Aerodrome, in the townland of Rathcool, Co. Cork. Further details regarding the site location and surrounding land use is detailed in Chapter 1 and Chapter 2 of this EIAR.

6.3.2 Current Land Use

The site of the Proposed Development comprises 20.69 hectares (Ha) of an existing aerodrome facility used by the Rathcool Flying Club and the HSE Air Ambulance service.

The site is bounded to the north by agricultural lands and the River Blackwater, to the south and east by local access roads and a wooded area and to the west by agricultural lands.

The site contains two warehouse hangers – one is used by the Rathcool Flying Club and the other is more recent and is used by the HSE Air Ambulance service. The site also contains a clubhouse which is used by the Rathcool Flying Club. It also contains a paramedic prefabricated base, crew prefabricated bases and a helipad which are used by the HSE Air Ambulance Service. Designated parking for Air Ambulance employees is provided adjacent to the paramedic prefabricated base. There is a grass runway which is used by the Rathcool Flying Club and the Air Ambulance in dry weather. The remainder of the site is made up of undeveloped open grassland.

There are three open drainage channels at the site as follows:

- An open drainage channel traverses the site from the southwest corner to the northeast corner of the site and discharging to the Rathcool River approximately 0.38km downstream of the site and ultimately the Blackwater River, which adjoins the northern boundary of the site, a further 0.29km downstream.
- A second open drainage channel is located along the west and north boundaries of the site discharging to the Blackwater River, which adjoins the northern boundary of the site
- A third open drainage channel traverses the centre of the site from the southern boundary to the northern boundary discharging to the open drainage channel along the northern boundary of the site.

As set out in the Cork County Development Plan 2022-2028, the site is located within the North Cork Strategic Planning Area and is not zoned for a specific use. Objective CS 2-5 of

the Cork County Development Plan 2022-2028 relates to the North Cork Strategic Planning Area and it notes that there is a need to diversify the rural economy by promoting a stronger tourism and leisure economy. Direct reference is made to the Rathcoole Aerodrome in Section 2.2.10 of the Cork County Development Plan 2022-2028. It highlights the significance of the Rathcoole Aerodrome as a commercial asset in North Cork and notes that favourable consideration will be given to appropriate proposals which seek to sustain its current and expand future functions subject to all relevant / normal planning considerations and taking account of its sensitive location relative to the Blackwater River. Therefore, the Proposed Development is considered to meet the zoning objectives of the Cork County Development Plan 2022-2028.

The existing layout of the site is presented in Figure 6-1.



Figure 6-1. Current Site Layout

6.3.3 Historical Land Use

The Rathcool Flying club was established in 1962 as a recreational, not for profit club, to facilitate members with access to a suitable airfield and aircraft at affordable rates. The club was granted a licence at the airfield in 1962 by the aviation regulator and has kept this licence valid to date.

An Air Ambulance Service was first established on the site in 2019 by the voluntary group Irish Community Air Ambulance (ICAA). This service has now been taken over by the Health Service Executive, National Ambulance Service and is fully funded by the HSE.

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 202) and Google Earth (Google Earth, 2025) were reviewed and key observations onsite and offsite are summarised in Table 6-3.

Table 6-3. Historical Land Use

Information Source	Site Description	Information Source
1837-1842	OSI Map 6 inch	Onsite: The Site is comprised of open fields divided by field boundaries. A ringfort is identified along the southern boundary of the site. Offsite: The surrounding area is predominantly open fields divided by field boundaries with occasional one-off building structures (likely of residential and agricultural use). The Blackwater River adjoins the northern boundary of the site.
1888-1913	OSI 25 Inch	Onsite: A drainage channel is observed to traverse the site from the southwest corner to the northeast corner of the site. The drainage channel is observed to discharge to an unnamed watercourse (i.e., mapped by the EPA (EPA, 2025) as the Rathcool River) approximately 0.38km downstream of the site and ultimately the Blackwater River a further 0.29km downstream. The ringfort along the southern boundary of the site is no longer identified. Offsite: The land to the north and south of the unnamed watercourse (i.e., mapped by the EPA (EPA, 2025) as the Rathcool River) is labelled as 'liable to floods'. There is some additional one-off building structures (likely of residential and agricultural use) identified in the surrounding area.
1995	OSI Aerial Photograph	Onsite: There are three (3No.) building structures (i.e., understood to be associated with Rathcoole Aerodrome which was established in 1962) observed along the southern boundary in the southeast corner of the site. There is a grass runway observed traversing the centre of the site. The runway is observed to cross the previously identified drainage channel. A second open drainage channel is located along the west and north boundaries of the site discharging to the Blackwater River. A third open drainage channel traverses the centre of the site from the southern boundary to the northern boundary discharging to the open drainage channel along the northern boundary of the site. Offsite: No significant changes. Ground disturbance works associated with the construction of a residential development are observed approximately 1.0km south of the site.
2001-2005	OSI Aerial Photograph	Onsite: No significant changes. Offsite: No significant changes. There is some increased residential development approximately 0.75km south of the site.
2013-2018	OSI Aerial Photograph	Onsite: One (1No.) of the three (3No.) building structures previously identified onsite (i.e., understood to be associated with Rathcoole Aerodrome which was established in 1962) has been removed. Offsite: No significant changes. Construction works for the residential development previously observed approximately 1.0km south of the site are complete.
2024	Google Earth	On site: The previously observed aerodrome facility has been redeveloped and expanded (including two warehouses, a clubhouse, a paramedic prefabricated base, crew prefabricated bases, a helipad, and a designated parking area). Off site: No significant changes.

6.3.4 Topography

A topographical survey of the site undertaken by Precise Control Land and Engineering Surveyors (PCLES) in June 2024 (PCLES, 2024) indicates that the topography of the site slopes gently toward the northern boundary of the site and the Blackwater River with ground levels ranging from 84.75 meters above Ordnance Datum (mOD) along the southern boundary of the site to 81.25mOD along the northern boundary of the site.

6.3.5 Soils

The soils beneath the majority of the site are mapped by Teagasc (Teagasc, 2024) as mineral alluvium (IFS Soil Code: AlluvMIN). While the soils beneath the southern portion of the site are mapped by Teagasc (Teagasc, 2024) as deep well drained mineral (mainly acidic) Acid Brown Earths and Brown Podzolics derived from mainly non-calcareous parent materials (IFS Soil Code: AminDW).

The GSI (GSI, 2025) mapped soils at the site are presented in Figure 6-2.

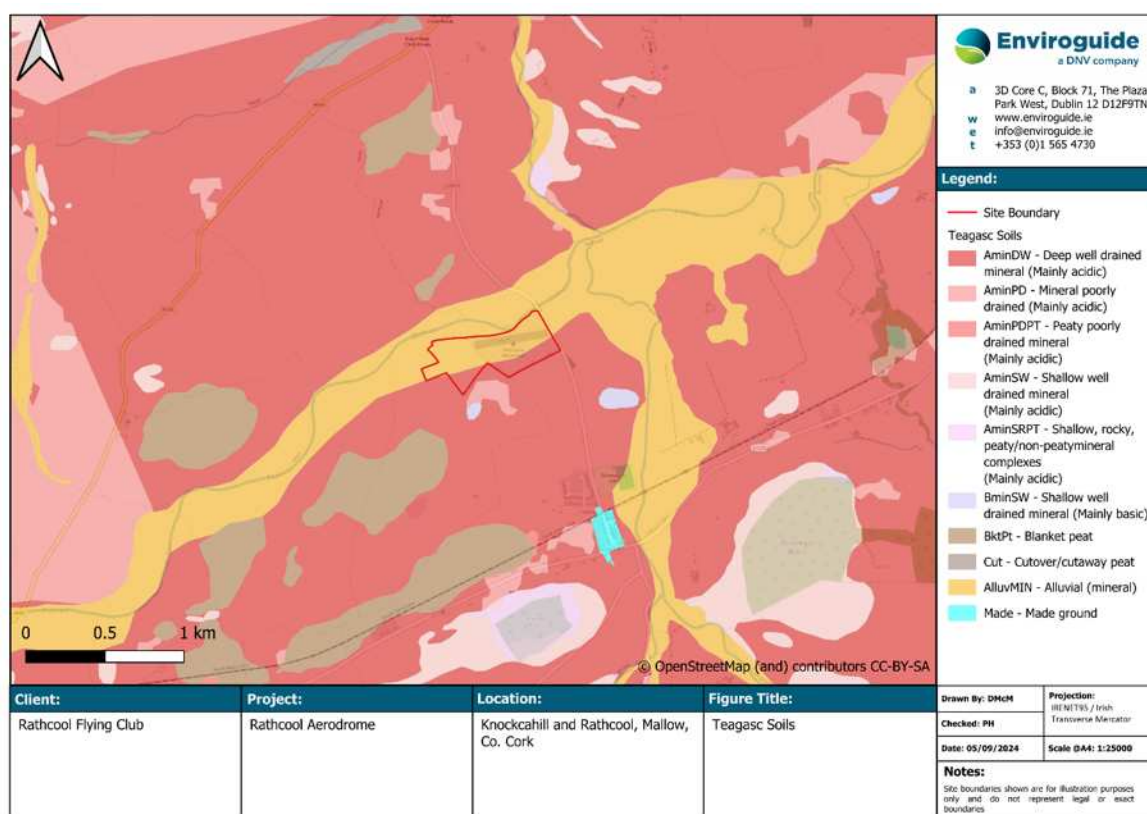


Figure 6-2. Soils

6.3.6 Quaternary Soils

The subsoil or quaternary sediments beneath the majority of the site are mapped by the GSI (GSI, 2025) as alluvium. While the southern portion of the site is mapped by the GSI (GSI, 2025) as till derived from Devonian sandstones (TDSs).

The GSI (GSI, 2025) mapped quaternary soils at the site are presented in Figure 6-3.

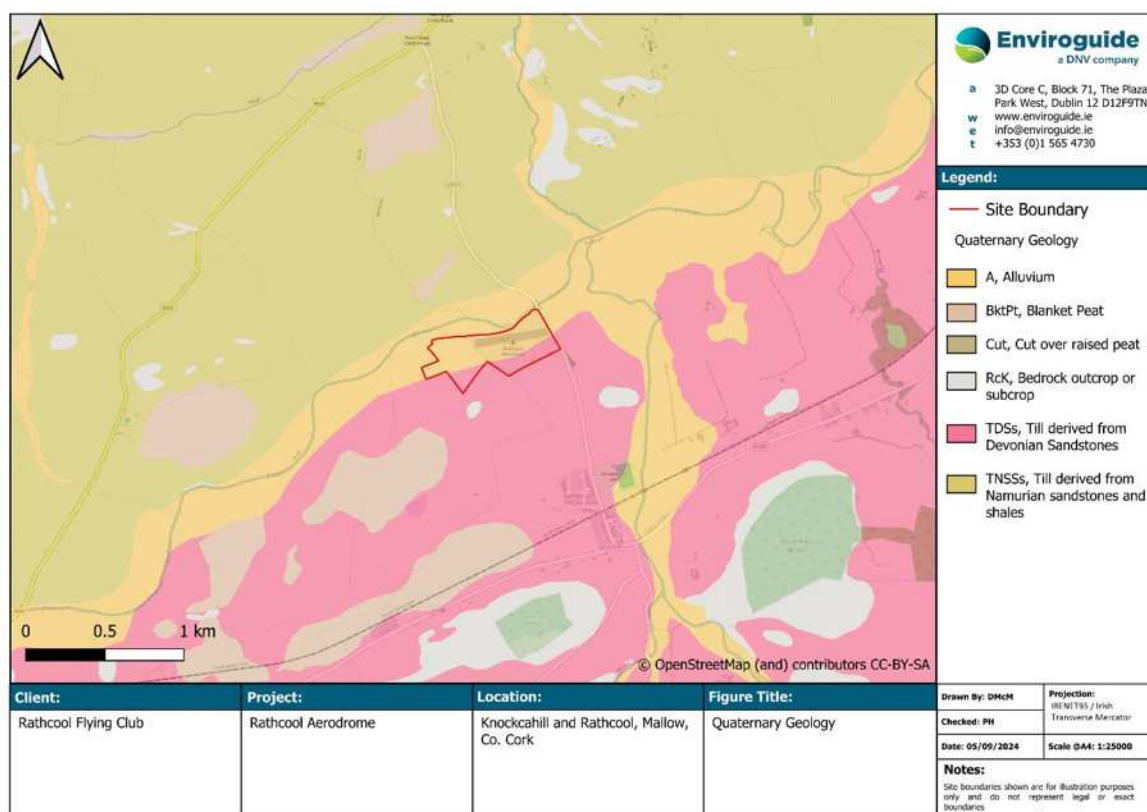


Figure 6-3. Quaternary Soils

6.3.7 Quaternary Geomorphology

There are 2 No. drumlins mapped by the GSI (GSI, 2025) within a 2 km radius of the site, which are located approximately 0.22km south and 0.84 km southwest of the site. The drumlins are oriented in a northeast to southwest direction.

There are five (5No.) streamlined bedrock formations within a 2 km radius to the north and south of the site. The streamlined bedrock formations are oriented in a southwest to northeast direction. The closest streamlined bedrock formation is mapped by the GSI (GSI, 2025) approximately 1.08km north of the site.

There are also several meltwater channels located within a 2 km radius of the site, the closest of which are approximately 0.51km northeast (oriented to the southeast) and 1.56km south (oriented to the north) of the site.

6.3.8 Bedrock Geology

The bedrock beneath the majority of the site is mapped by the GSI (GSI, 2025) as Westphalian (undifferentiated) (New Code: CWWES) described as grey shale, thin siltstone and sandstone. The bedrock beneath the southern portion of the site is mapped by the GSI (GSI, 2025) as Dinantian Limestones (undifferentiated) (New Code: CDDIN) described as limestone.

While there are no bedrock outcrops mapped within the site boundary, there are a number of bedrock outcrops mapped by the GSI (GSI, 2025) within a 2km radius of the site. The closest bedrock outcrop recorded by the GSI (GSI, 2025) is located approximately 0.75km north of the site. Additional outcropping is recorded further west and north of the site.

The bedrock geology is presented in Figure 6-4.

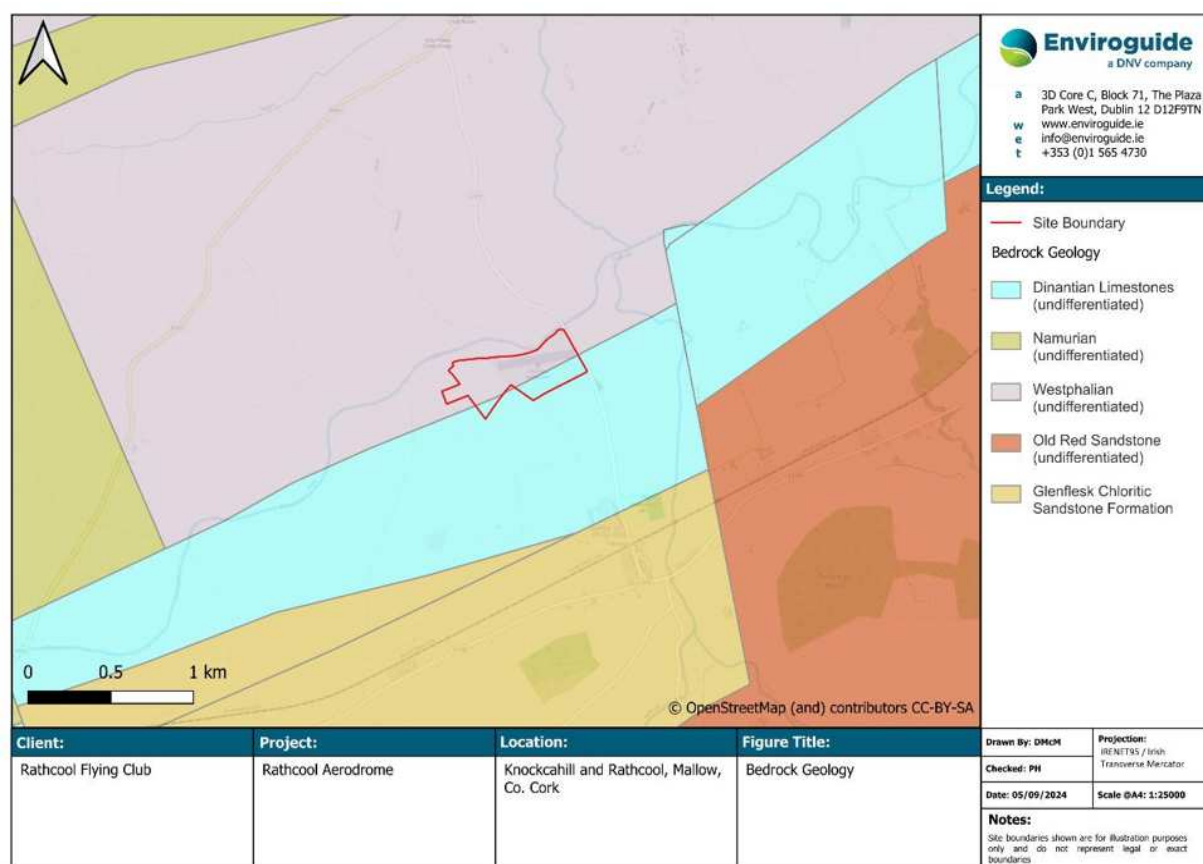


Figure 6-4. Bedrock Geology

6.3.9 Site Investigation Results

The soils and geology encountered during the site investigation undertaken by O’Riordan Architectural and Building Services Ltd. in March 2022 (available in Volume 3 Appendix 6-1 of this EIAR) are summarised as follows:

- Topsoil comprising brown SILT was encountered from ground level to 0.4mbGL.
- The topsoil was observed to be underlain by brown / grey CLAY to 2.1mbGL.
- The CLAY unit was observed to be underlain by brown / grey gravelly SAND to the maximum extent of excavation at 3.0mbGL.
- Bedrock was not encountered during the site investigation.
- Groundwater was not encountered during the site investigation.

The soils and geology encountered during the site investigation undertaken by Clement O’Sullivan Engineering Design Solutions Ltd. in July 2024 (available in Volume 3 Appendix 6-2 of this EIAR) are summarised as follows:

- Topsoil comprising dark brown gravelly sandy SILT with widely spaced rootlets was encountered from ground level to between 0.15 meters below ground level (mbGL) (Trial Hole 3; Clement O’Sullivan Engineering Design Solutions Ltd., 2024) and 0.6mbGL (Trial Hole 4; Clement O’Sullivan Engineering Design Solutions Ltd., 2024).

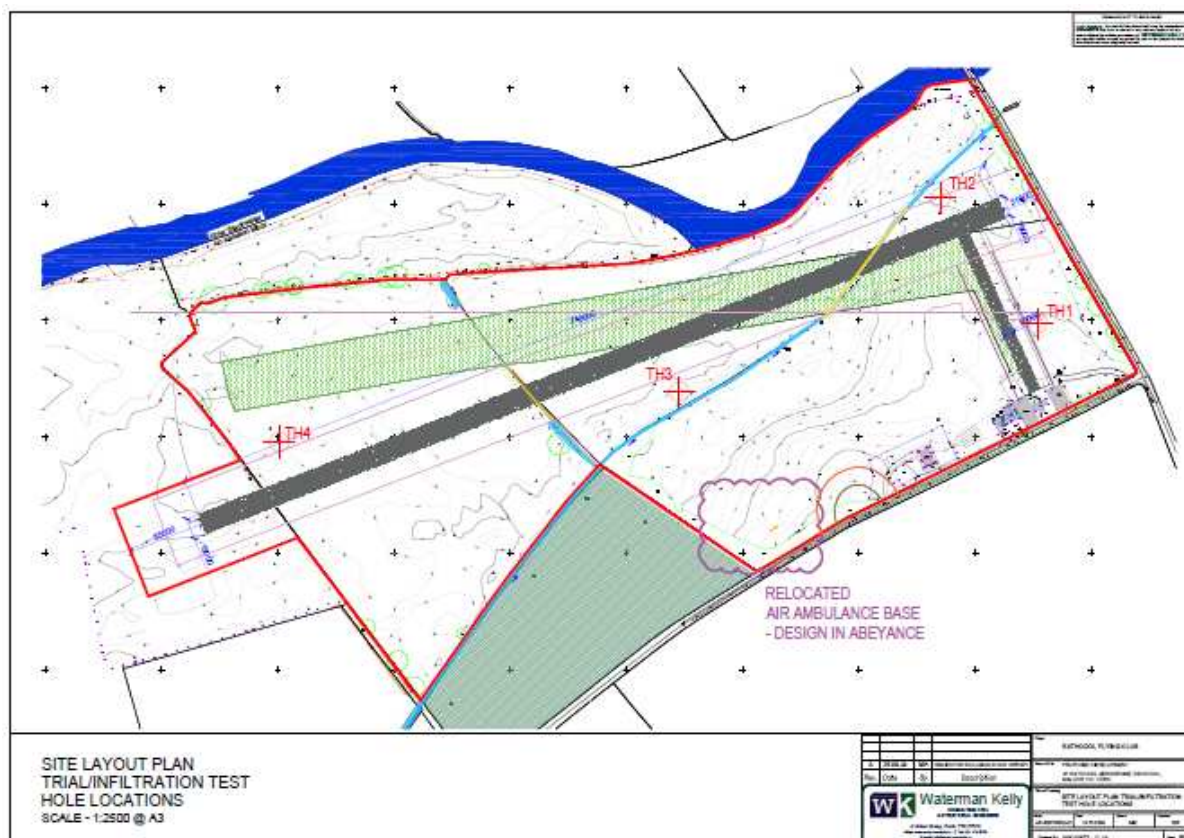


Figure 6-6. Site Investigation Locations (Source: Clement O'Sullivan Engineering Design Solutions Ltd., 2024)

6.3.10 Geochemical Domain

The GSI along with the EPA have developed geochemically appropriate levels (GALs) for soil recovery facilities across Ireland specifically in relation to metals and metalloids in uncontaminated soil and stone (GSI, 2025). There are a total of seven defined domains across the country. The GSI (GSI, 2025) defined Geochemical Domains map indicates that the majority of the site is located within Geochemical Domain 1 which is characterised as Namurian shale and sandstone, while the southern portion of the site is located within Geochemical Domain 4 which is characterised as Devonian sandstone, siltstone and shale (ORS).

A summary of the metal values for Geochemical Domains 1 and 4 are presented below in Table 6-4

Table 6-4. Geochemically Appropriate Levels for Domain 1 and Domain 4

Element	Units	Value	
		Geochemical Domain 1	Geochemical Domain 4
Arsenic	mg/kg	15.60	32.30
Cadmium	mg/kg	1.50	0.97
Chromium	mg/kg	51.50	51.70
Copper	mg/kg	51.20	80.40

Element	Units	Value	
		Geochemical Domain 1	Geochemical Domain 4
Mercury	mg/kg	0.25	0.28
Nickel	mg/kg	47.80	50.30
Lead	mg/kg	48.30	91.40
Zinc	mg/kg	137.00	155.00

6.3.11 Radon

The Radon Risk Map of Ireland (EPA, 2025) shows a prediction of the number of the houses in any one area that are likely to have high radon levels. The map is based on an analysis of indoor radon measurements plus geological information including, bedrock type, quaternary geology, soil permeability and aquifer type.

The majority of the site is mapped by the EPA (EPA, 2025) as being in an area where 'about 1 in 10 homes in this area is likely to have high radon levels'. While the southern portion of the site is mapped by the EPA (EPA, 2025) as being in an area where 'about 1 in 5 homes in this area is likely to have high radon levels'.

The EPA cite the reference level for radon as 200 Bq/m³ and a High Radon Area where more than 10% of homes may have more than the reference level of radioactivity. As 5% to 10% of the houses in the area are mapped by the EPA as being over this reference level it indicates that the site is considered a High Radon Area (EPA, 2025).

It is noted that north and mid Cork have one of the highest incidences of radon gas in the country (EPA, 2025). However, a high radon level can be found in any home, in any part of the country, but these homes are more likely to be located in High Radon Areas.

6.3.12 Geohazards

Earthquakes are not likely to occur in the vicinity of the site at a sufficient intensity to pose a risk for the Proposed Development.

The GSI database (GSI, 2025) indicated that the site is located within an area of low susceptibility to landslides. There are no recorded landslides recorded on the GSI database (GSI, 2025) at the site or within a 2km radius of the site.

There are no karst features mapped by the GSI (GSI, 2025) at the Site or within a 2km radius of the site.

6.3.13 Geological Heritage Sites

There are no geological heritage sites mapped by the GSI (GSI, 2025) at the site or within a 2km radius of the site. The closest geological heritage site is the Owentaraglin River located approximately 8.91km west of the site and is described as a number of tight meanders along the course of the Owentaraglin River, south of Kishkeam (GSI, 2025).

6.3.14 Economic Geology

The lands beneath the majority of the site are mapped by the GSI (GSI, 2025) to have a moderate potential for granular aggregate. However, the southern portion of the site is mapped by the GSI (GSI, 2025) to have no granular aggregate potential.

The bedrock beneath the majority of the site has been mapped by the GSI (GSI, 2025) as having a very low potential for crushed rock aggregate. While the southern portion of the site is mapped by the GSI (GSI, 2025) as having a moderate potential for crushed rock aggregate.

There are no historical pits or quarries mapped by the GSI (GSI, 2025) at the site or within a 2km radius of the site.

6.3.15 Importance of the Baseline Environment

In accordance with the TII Guidance as documented by the NRA (NRA, 2009) and as outlined in Table 6-1, the soil and geology underlying the site of the Proposed Development would be rated as an attribute of 'low to moderate' importance due to its current use as an airfield and given that while the subsoils are mapped as having a moderate potential for granular aggregate and the bedrock is mapped as having a very low to moderate potential for crushed rock, economic extraction is not considered feasible. Furthermore, there are no geological heritage sites recorded at the site.

6.4 Characteristics of the Proposed Development

The construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing operations building and paramedic base building to the east of the site, and construction of a new operations and paramedic base building to the west of the site; and the demolition of an existing helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary waste water treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, the upgrade of an existing entrance onto the L-5215-0 road, site landscaping and all other associated site development works.

A full description of the Proposed Development is outlined in Chapter 1 of this EIAR.

The following components are of particular relevance with respect to land, soils and geology.

6.4.1 Construction Phase

It is estimated that the construction works would have a timescale of approximately 4 months from initial commencement onsite. The construction phase of the Proposed Development will include:

- The demolition of an existing hangar, the existing paramedic prefabricated base and crew prefabricated base to the east of the site.
- The breaking up / removal of a helipad to the east of the site.

- Stripping of existing topsoil and excavation of underlying subsoil will be required to facilitate the construction of the proposed hard surfaced runway, foundations for the proposed hangar, the paramedic prefabricated base and crew prefabricated base, the new helipad, associated hardstanding areas, and utility infrastructure including new proprietary waste water treatment system.
- The depth of excavations are estimated as follows:
 - Proposed hard surfaced runway – 0.3mbGL.
 - Proposed taxiway - 0.3mbGL.
 - Drainage – 0.9mbGL.
 - Infiltration systems / soakaways – 1.8mbGL.
 - Air ambulance base – 0.3mbGL.
- It is understood that there will be no requirement for piling.
- It is anticipated that there will be no requirement for the excavation of bedrock during the construction phase of the Proposed Development.
- The estimated total excavated volume of topsoil and subsoil for excavation to construct the Proposed Development is 10,792m³ (7,546m³ topsoil and 3,246m³ subsoil).
- All topsoil, and surplus subsoil materials (where required) will require removal offsite in accordance with all statutory legislation.
- Temporary stockpiling of excavated material pending export offsite.
- The importation of an estimated 16,167m³ of aggregate fill materials will be required for the construction of the Proposed Development (e.g., granular material beneath runway / taxiway, air ambulance base and for drainage and utility bedding / surrounds etc.).

6.4.2 Operational Phase

The operational phase of the Proposed Development consists of the typical activities in an aerodrome facility and there will be no bulk excavation of soils or bedrock or infilling of waste.

The land use at the site will remain unchanged and the Proposed Development will continue to be operated as an aerodrome facility. The Proposed Development will continue to be operated in accordance with the conditions of the Aviation Licence issued annually by the Irish Aviation Authority (IAA).

6.5 Potential Impact of the Proposed Development

The procedure for determination of potential impacts on the receiving land, soils and geology are to identify potential receptors within the Proposed Development site boundary and surrounding environment and use the information gathered during the desk study and site walkover to assess the degree to which these receptors will be impacted upon in the absence of mitigation.

The potential impacts associated with the construction phase and operational phase of the Proposed Development are summarised below. Impacts are described in terms of quality, significance, duration and type as detailed in Table 6-2.

6.5.1 Construction Phase

6.5.1.1 Land Use

The land use at the site will remain unchanged and the Proposed Development will continue to be operated as an aerodrome facility. The site of the Proposed Development is located within the North Cork Strategic Planning Area and is not zoned for a specific use. Direct reference is made to the Rathcool Aerodrome in Section 2.2.10 of the Cork County Development Plan 2022-2028. It highlights the significance of the Rathcoole Aerodrome as a commercial asset in North Cork and notes that favourable consideration will be given to appropriate proposals which seek to sustain its current and expand future functions subject to all relevant / normal planning considerations and taking account of its sensitive location relative to the Blackwater River. Therefore, the Proposed Development is in line with the objectives of the Cork County Development Plan 2022-2028. It is considered that there will be an a 'neutral', 'imperceptible' and 'permanent' impact taking account of the current and future proposed land use and objectives of the Cork County Development Plan 2022-2028.

6.5.1.2 Excavation and Removal of Soil and Subsoil

There will be an unavoidable loss of in-situ topsoil and subsoil from the construction of the Proposed Development to achieve the required formation levels for the Proposed Development including the proposed hard surfaced runway, taxiway and helipad, associated hardstanding areas, and utility infrastructure.

All topsoil and surplus subsoil materials (where required) will require removal offsite in accordance with all statutory legislation. The soils underlying the site are considered to be of 'low' to 'moderate' importance (refer to Section 6.3.15). Accordingly, there will be a 'negative' 'slight' and 'permanent' impact on the underlying soil and subsoil at the site.

The removal of topsoil and surplus subsoil offsite will be undertaken in accordance with applicable statutory requirements. This may include where suitable, removal as by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011. The potential impact with removal offsite of surplus topsoil, subsoil and other material as waste is assessed in Chapter 13 of this EIAR.

6.5.1.3 Soil Quality and Contamination

There is a potential risk associated with the use of cementitious materials during construction of subsurface structures (such as foundations) on the underlying soil and geology at the Proposed Development. It is considered that this may result in a 'negative', 'moderate' and 'long-term' impact on existing quality of soil within a localised area underlying the Proposed Development.

The potential accidental release of deleterious materials including fuels and other materials being used onsite, through the failure of secondary containment or a materials' handling accident on the Proposed Development could potentially result in a 'negative', 'moderate to significant', 'long-term' impact on the receiving soil and geology depending on the nature of the incident.

6.5.1.4 Dust Generation

There is a potential for creation of windblown dust generation from the temporary stockpiling of materials onsite. There will be some exhaust emissions generated from use of excavators,

HGVs (heavy goods vehicles) and vibrating rollers during the construction phase of the Proposed Development. An assessment of the potential impact of the Proposed Development with regard to the generation of dust is addressed in Chapter 8 of this EIAR.

6.5.1.5 Importation of Fill Materials

The importation of aggregate materials will be required for the construction of the Proposed Development (e.g., granular material beneath the runway and helipad, under prefabricated bases and for drainage and utility bedding / surrounds). The potential impacts may include loss of attribute and changes in the geological regime at the source site. It is anticipated that the required aggregates identified for importation onsite will be 'indirect' and have a 'neutral,' 'imperceptible' and 'permanent' impact on the source site taking account of the fact that the statutory consent process would have required the necessary environmental impacts to be assessed and mitigated as appropriate at the source site.

6.5.1.6 Geological Hazards

Earthquakes are not likely to occur in the vicinity of the site at a sufficient intensity to pose a risk for the Proposed Development. The GSI database (GSI, 2025) indicates that the site of the Proposed Development is located within an area of 'low' susceptibility to landslides.

The subject site is not located within in an area associated with karst geology and therefore there is no identified risks associated with karst features.

All aggregates imported to the site for use in the Proposed Development will be subject to strict quality control procedures in accordance with the design specification and relevant Building Regulations therefore avoiding any potential issues with pyrite in aggregates.

The site is identified as being located within a High Radon Area. The design and specification for all hangers will be in accordance with current Building Regulations and therefore any potential issues associated with radon will be addressed and avoided. Therefore, the potential risks associated with radon at the site is considered 'neutral' 'imperceptible' and 'permanent'.

6.5.2 Operational Phase

During the operational phase of the Proposed Development there is a limited potential for any direct adverse impact on the receiving land, soil and geological environment at the site taking account of the design for the Proposed Development.

With the exception of rainfall on undeveloped grassland areas of the site, there will be no discharges to ground during the Operational Phase of the Proposed Development.

The potential accidental release of hazardous material including aviation fuel for helicopters, with any associated impact on the receiving land, soil and geology environment would only occur through the failure of secondary containment or a major incident on the site and could potentially result in a 'negative' 'moderate to significant' and 'long-term' impact. However, taking account of procedures already in place for the existing facility to effectively manage such an incident and prevent environmental harm this scenario is deemed unlikely

No public health issues associated with the land, soil, geology conditions at the site have been identified for the Operational Phase of the Proposed Development. Human health is assessed in Chapter 4 of this EIAR.

6.5.3 Potential Cumulative Impacts

Cumulative Impacts can be defined as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor. Such effects are not caused or controlled by the project developer.

As part of this assessment, other offsite developments and proposed offsite developments as detailed in Chapter 2 of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Development.

6.5.3.1 Excavation and Removal of Soil and Subsoil

The offsite removal of excavated topsoil and surplus subsoil (where required) during the construction phase of the Proposed Development could potentially be directed to the same receiving waste facilities for recovery / disposal as excavated materials from other developments detailed in Chapter 2 of this EIAR. All topsoil and surplus subsoil materials from the site will be removed offsite in accordance with all statutory legislation. Accordingly, it is considered that any cumulative impact on lands, soils and geology associated with the Proposed Development will be ‘neutral’, ‘imperceptible’ and ‘permanent’.

6.5.3.2 Import of Aggregates and Materials

The importation of aggregates to the Proposed Development may be sourced from the same borrow site as other permitted developments detailed in Chapter 2 of this EIAR. However, contract and procurement procedures will ensure that all aggregates and fill material originating from quarry sources that will be required for construction are sourced from reputable authorised suppliers operating in a sustainable manner and in accordance with the necessary statutory consents. Therefore, regardless of the number of other projects and developments using aggregates from the same source sites, there will be an ‘indirect’, ‘neutral’, ‘imperceptible’ and ‘permanent’ impact on the geological environment at the source site.

There are no other cumulative impacts associated with land, soil and geology associated with the construction phase and operational phase of the Proposed Development.

6.5.4 “Do Nothing” Impact

The ‘Do Nothing’ scenario assesses the potential impact on the receiving land, soils, and geological environment if the Proposed Development did not proceed.

It is considered that there would be no change or resulting impact on the nature of the site with respect to land, soil and geology at the site which would continue to be operated as an aerodrome facility.

6.6 Avoidance, Remedial and Mitigation Measures

The mitigation measures as outlined below, will ensure that there will be no significant impact on the receiving land, soil and geology.

6.6.1 Construction Phase

During the Construction Phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP) (Waterman Consulting Engineers, 2025) submitted with the planning application. Following appointment, the contractor will be required to further develop the OCEMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532', CIRIA, 2001). The CEMP will be implemented for the duration of the construction phase, covering construction and waste management activities that will take place during the construction phase of the Proposed Development.

6.6.1.1 Import of Aggregates and Materials

Contract and procurement procedures will ensure that all imported aggregates and materials required for the construction phase of the Proposed Development will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations. The importation of aggregates and materials will be subject to management and control procedures which will include testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. Therefore, any unsuitable material will be identified prior to unloading / placement onsite.

6.6.1.2 Airborne Dust

Excavated soils will be carefully managed and maintained in order to minimise potential impact on soil quality and soil structure. Handling of soils will be undertaken in accordance with documented procedures that will be set out in order to protect ground and minimise airborne dust. As outlined in the OCEMP (Waterman Consulting Engineers, 2025), the measures required to prevent airborne dust emissions and associated nuisance arising from site work will be in place including measures to prevent uncovered soil drying out leading to wind pick up of dust and mud being spread onto the local road network and adjoining properties. This may require additional wetting at the point of dust release, dampening down during dry weather and wheel cleaning for any vehicles leaving the site. Potential impacts and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 8 of this EIAR.

6.6.1.3 Reuse of Soil

Subsoil materials to be reused within the Proposed Development (i.e., for landscaping on site) will be subject assessment of the suitability of for use in accordance with engineering and environmental specification for the Proposed Development.

6.6.1.4 Management and Control of Soils and Stockpiles

Segregation and storage of soils for removal off-site and waste for disposal off-site will be segregated and temporarily stored on-site pending removal or for reuse on-site.

Where possible, stockpiling of soils and subsoils onsite will be avoided. However, in the event that stockpiling is required, stockpiled materials, pending removal offsite, will be located away from the location of any sensitive receptors (watercourses and drains). In accordance with

Inland Fisheries Ireland guidelines, stockpiles will not be allowed within 30m of the open water where sufficient working areas are available within the site boundary.

Material pending removal offsite will be segregated and stockpiled appropriately. For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination for re-use, recovery site or waste facility is pending, excavated soil for recovery/disposal will be stockpiled as follows:

- A suitable temporary storage area will be identified and designated. The storage area will be fully enclosed with an appropriate silt-fencing system
- All stockpiles shall be assigned a stockpile number.
- Material identified for reuse on site, off site and waste materials will be individually segregated and all segregation, storage and stockpiling locations will be clearly delineated on the Site drawings.
- Soil stockpiles will be covered to prevent run-off from the stockpiled material generation and/or the generation of dust.
- Material identified for reuse on site, off site and waste materials will be individually segregated.
- Any waste that will be temporarily stored / stockpiled will be stored on impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross contamination with soil.
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust.
- Stockpiles will be a minimum of 30m from drainage channels and watercourses (i.e., the Blackwater River).

6.6.1.5 Export of Resource (Soil and Subsoil) and Waste

All surplus materials and any waste will be removed off-site and managed in accordance with all legal obligations. A Construction Waste Management Plan (CWMP) should be prepared by the appointed main contractor once appointed) prior to commencement of works. It will be the contractor's responsibility to either; obtain a waste collection permit or, to engage specialist waste service contractors who will possess the requisite authorisations, for the collection and movement of waste off-site.

The re-use of soil and subsoil offsite will be undertaken in accordance with all statutory requirements and obligations including where appropriate re-use as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended.

Any surplus material not suitable for re-use as a by-product and other waste materials arising from the Construction Phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. As only authorised facilities will be used, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures.

Any waste soils will be transported under a valid waste collection permit issued under the Waste Management (Collection Permit) Regulations 2007, as amended and will be delivered to an appropriately authorised waste management facility.

Waste bins, containers, skip containers and storage areas will be clearly labelled with waste types which they should contain including photographs as appropriate.

Materials and waste will be documented prior to leaving the site. All information will be entered into a waste management register kept on the Site. Waste collection permits for registered hauliers and certs of registration/ licenses/permits for authorised waste facilities will be kept on file at head office.

All site personnel and sub-contractors will be instructed about the objectives of the CDWMP and informed of their responsibilities as a consequence of its provisions

Vehicles transporting material with potential for dust emissions to an off-site location shall be enclosed or covered with a tarpaulin at all times to restrict the escape of dust.

Public roads outside the Site will be regularly inspected for cleanliness and cleaned as necessary. The main contractor will carry out road sweeping operations, employing a suction sweeper or similar appropriate method, to remove any project related dirt and/or material deposited on the road by construction/ delivery vehicles. Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.

6.6.1.6 Concrete Works

The cementitious grout and other concrete works during the Construction Phase, will avoid any contamination of ground through the use of appropriate design and methods implemented by the appointed contractor and in accordance with relevant industry standards.

As documented in the OCEMP (Waterman Consulting Engineers, 2025), excess concrete which may need to be removed from foundations/formwork during construction will be contained and removed to a designated area on site where the concrete will be allowed to set in temporary forms until set. Once fully set, the concrete will be removed to an approved facility.

Wash water from cleaning ready mix concrete lorries and mixers may be contaminated with cement and is therefore highly alkaline. Due to the size of the site and the proximity of sensitive watercourses, it is recommended that lorries and mixers are washed out of offsite.

The pouring of concrete, sealing of joints, application of water proofing paint or protective systems, curing agents etc. will be completed during dry conditions.

Where required, a suitable risk assessment for wet concreting will be completed prior to works being carried out. Pumped concrete will be monitored to ensure there is no accidental discharge.

6.6.1.7 Handling of Fuels, Chemicals and Materials

Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the OCEMP (Waterman Consulting Engineers, 2025), in a designated area of the site away from any watercourses and drains (where not possible to carry out such activities offsite).

As documented in the OCEMP (Waterman Consulting Engineers, 2025), any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas. These areas will be bunded and located away (minimum of 50m) from drainage and watercourse (i.e., the Blackwater River).

Bunds will have regard to current best practice for oil storage (Enterprise Ireland, BPGCS005) and Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013). All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the total volume of substance that could be stored within the bunded area.

Environmentally friendly materials will be used during the construction process including the use of biodegradable lubricants and hydraulic fluids for machinery and equipment.

Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the site. Only emergency breakdown maintenance will be carried out on-site. Drip trays and spill kits will be available on-site to ensure that any spills from vehicles are contained and removed off-site.

There may also be the requirement for use of portable generators or similar fuel containing equipment during the construction phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times

The appointed contractor will maintain an emergency response action plan and emergency procedures will be developed by the appointed contractor in advance of any works commencing. Construction staff will be familiar with the emergency response plan.

Spill kits will be made available onsite and identified with signage for use in the event of an environmental spill or leak. A spill kit will be kept in close proximity to the fuel storage area for use in the event of any incident during refuelling or maintenance works. Heavy machinery used on the site will also be equipped with its own spill kit.

6.6.1.8 Emergency Procedures

Emergency procedures will be developed by the appointed contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site.
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants.
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the Proposed Development Site and compliantly disposed of off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards.

- All construction works staff will be familiar with emergency procedures in the event of accidental fuel spillages.
- All construction works staff on-site will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving land, soil and geological environment associated with the construction phase of the Proposed Development.

6.6.1.9 Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Foul drainage from temporary welfare facilities during the construction phase of the Proposed Development will be discharged to temporary holding tank(s) the contents of which will periodically be tankered off site to a licensed facility. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations by tankering of waste offsite by an appropriately authorised contractor.

Any connection to the public foul drainage network during the construction phase of the Proposed Development will be undertaken in accordance with the necessary temporary discharge licences issued by UE.

6.6.2 Operational Phase

There is no requirement for mitigation measures for the Operational Phase taking account of the design measures for the Proposed Development.

During the Operational Phase of the Proposed Development there is limited to no potential for any impact on the receiving land, soil and geology environment and therefore there is no mitigation required in regard to the Proposed Development.

The avoidance measures, as outlined below, which are in place as part of the baseline condition at the Site, will ensure that there will be no significant impact on the receiving land, soil and geological environment.

The Proposed Development will continue to be operated in accordance with the conditions of the Aviation Licence issued annually by the Irish Aviation Authority (IAA).

The aircraft use Avgas fuel, which is similar in composition to petrol. No aircraft fuel will be stored onsite during the operational phase of the proposed development. The fuelling of the planes will take place offsite at either Cork Airport, Farrenfore, or other airfields which have fuel stores on-site. By 2030 it is an objective to convert the Cessna aircraft to Sustainable Aviation Fuel (SAF). This fuel will be available from Cork airport by 2026 and this will provide a stopgap until fully electric aircraft are viable from the airfield.

The helicopters use Jet fuel, which is similar in composition to kerosene. There will be no fixed fuel storage tank for re-fuelling aircraft located at site of the Proposed Development and the helicopters will be refuelled by way of on point refuelling on request from the operator. Once a request for refuelling has been received the fuel will be delivered in a bunded aviation fuel bowser. Bunded tanks will adhere to ISO 9000 regulations and will be able to hold 110% of the tanks capacity to prevent overfilling, sudden tank failure, loss of tank contents and to facilitate rainfall during spillages. Further details are provided in Chapter 15 of this EIAR.

During the operational phase of the Proposed Development, the planes will be hosed down with water from the existing supply onsite or 'dry' cleaned. Chemicals will not be used in the cleaning process as this could cause the aluminium of the planes to rust.

6.6.3 "Worst Case" Scenario

In a worst case scenario, potential accidental release involving fuels or other hazardous substances used during the Construction or Operational Phases, effects on land, soils and geology could be 'negative', with a potential significance ranging from 'moderate' to 'significant' and of 'long-term' duration. Such effects are expected to only arise in the event of a failure of secondary containment or an exceptional incident on site. Given the standard controls, containment systems and management procedures proposed, the likelihood of this scenario occurring is considered low.

6.7 Residual Impacts

Residual Impacts are defined as 'effects that are predicted to remain after all assessment and mitigation measures. They are the remaining 'environmental costs' of a project and are the final or intended effects of a development after mitigation measures have been applied to avoid or reduce adverse impacts.

The predicted impacts of the construction phase and operational phase of the Proposed Development are described in Table 6-5 in terms of quality, significance, extent, likelihood, and duration. The relevant mitigation measures are detailed, and the residual impacts are determined which take account of the avoidance, remedial and mitigation measures.

Overall, there is no significant residual impacts on land, soils and geology anticipated regarding this Proposed Development.

Table 6-5. Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Construction of the Proposed Development	Land Use	The land use at the site will remain unchanged and the Proposed Development will continue to be operated as an aerodrome facility.	Neutral	Imperceptible	Permanent	Direct	No mitigation. The Proposed Development is in line with the objectives of the Cork County Development Plan 2022-2028..	Imperceptible
Excavation of In-situ Soils and Subsoil	Soils and Subsoil	There will be an unavoidable loss of in-situ soil and subsoil from the construction of the Proposed Development to achieve the required formation levels for the Proposed Development including the proposed hard surfaced runway, taxiway and helipad, hanger foundations, associated hardstanding areas, and utility infrastructure.	Negative	Slight	Permanent	Direct	None required. The removal of all surplus soil will be undertaken in accordance with applicable statutory requirements.	Slight

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Use of Cementitious Materials.	Soils and Subsoils	Potential release of cementitious material during construction of subsurface structures (such as foundations) to the land, soil, and geological environment.	Negative	Moderate	Long Term	Direct	The cementitious grout and other concrete works during the Construction Phase, will avoid any contamination of ground through the use of appropriate design and methods implemented by the appointed contractor and in accordance with the CEMP and relevant industry standards.	Imperceptible
Accidental Release of Deleterious Materials (e.g., Fuels or Other Hazardous Materials Being Used Onsite).	Soils, Subsoils and Bedrock	Potential (albeit low) for uncontrolled release of deleterious materials including fuels and other materials being used on-site, through the failure of secondary and tertiary containment or a materials handling accident, to the land,	Negative	Moderate to Significant	Long Term	Direct / Worst Case	Refueling of plant and storage of any deleterious materials including fuels will be undertaken in accordance with the requirements and procedures outlined in the CEMP.	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
		soil, and geological environment.						
Import of Aggregates Materials	Land, Soil and Geology at the Source Site	The Proposed Development will require the importation of aggregates for granular material beneath the runway and helipad, under prefabricated bases and for drainage and utility bedding / surrounds). The potential impacts may include loss of attribute and changes in geological setting at the source site.	Negative	Slight	Permanent	Indirect	Only certified materials from authorised sources will be used.	Imperceptible.
Operational Phase								
Accidental Release of Hazardous Material Including Aviation Fuel for Helicopters		Potential (albeit low) for uncontrolled release of deleterious materials including aviation fuel and other materials being used on-site, through the failure of secondary and tertiary containment or a materials handling	Negative	Moderate to Significant	Long Term	Direct / Worst Case	Bunded aviation fuel bowers brought onto site will adhere to ISO 9000 regulations and will be able to hold 110% of the tanks capacity to prevent overfilling, sudden tank failure, loss of tank	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
		accident, to the land, soil, and geological environment.					contents and to facilitate rainfall during spillages.	

6.8 Monitoring

6.8.1 Construction Phase

During the construction phase the following monitoring measures will be considered:

- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with avoidance, remedial and mitigation measures.
- Inspections and monitoring will be undertaken during excavations and other groundworks to ensure that measures that are protective of water quality are fully implemented and effective.
- Materials management and waste audits will be carried out at regular intervals to monitor the following:
 - Management of soils on-site and for removal offsite.
 - Record keeping.
 - Traceability of all materials, surplus soil and other waste removed from the site; and
 - Ensure records are maintained of material acceptance at the end destination.

6.8.2 Operational Phase

There are no monitoring requirements specifically in relation to land, soil and geology during the operational phase of the Proposed Development

6.9 Interactions

6.9.1 Population and Human Health

An assessment of the potential impact of the Proposed Development on human health is included in Chapter 4 of this EIAR.

There is a potential risk of dust generated from excavation and stockpiling of soil during the Construction Phase of the Proposed Development posing a human health risk in the absence of standard avoidance and mitigation measures which will be implemented to be protective of human health. Appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers.

6.9.2 Biodiversity

An assessment of the potential impacts of the Proposed Development on the Biodiversity of the Site, with emphasis on habitats, flora and fauna which may be impacted as a result of the excavation and importation of materials to the Site are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

6.9.3 Hydrology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR. In the absence of

avoidance, remedial and mitigation measures, piling during the construction phase of the Proposed Development, may potentially create pathways for potential sources of contamination in shallow soils to enter underlying groundwater. Procedures for the protection of receiving water environment are set out in Chapter 7 of this EIAR.

6.9.4 Air Quality and Climate

The excavation of soils across the Site and the temporary stockpiling of soils pending reuse or removal offsite has the potential to generate nuisance impacts (i.e., dust) during the Construction Phase of the Proposed Development. An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 and Chapter 9 of this EIAR.

6.9.5 Landscape and Visual

The land use at the site will remain unchanged and the Proposed Development will continue to be operated as an aerodrome facility. The Proposed Development will consist of the construction of a hard surfaced runway (740m in length), and taxiway with associated ground level lighting, associated interceptors, along with the relocation of an existing hanger, paramedic prefabricated base, crew prefabricated bases, helipad and all associated works. An assessment of the potential impact of the Proposed Development on the receiving landscape is included in Chapter 11 of this EIAR.

6.9.6 Material Assets - Traffic, Transport, Utilities, Infrastructure and Waste

It is anticipated that all excavated soil material will require removal offsite. There is also a requirement to import aggregates during the construction phase of the Proposed Development. An assessment of the potential impact of the Proposed Development on the Material Assets (Traffic and Transport) and Material Assets (Utilities, Infrastructure and Waste) are included in Chapter 13 and Chapter 14 of this EIAR respectively.

6.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this Chapter of the EIAR.

6.11 References

Construction Industry Research and Information Association, 2023. Environmental good practice on site guide (CIRIA -C811).

Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites. Guidance for Consultants and Contractors (CIRIA – C532).

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Clement O'Sullivan Engineering Design Solutions Ltd., 2024. Trial Hole Report.

Enterprise Ireland. Best Practice Guide BPGCS005. Oil Storage Guidelines.

Environmental Protection Agency, 2025. EPA Envision Maps. <https://gis.epa.ie/EPAMaps/>. Consulted on 06/09/2024.

Environmental Protection Agency, 2020. Guidance on Waste Acceptance Criteria at Authorised Soil Recovery Facilities.

Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Geological Society of Ireland, 202. GSI web mapping.
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Institute of Geologists of Ireland Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements.

National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes.

O'Riordan Architectural and Building Services Ltd., 2022. Site Characterisation Form.

S.I. No. 92 of 2011- European Parliament and of the Council on the assessment of the effects of certain public and private projects on the environment including amendments S.I. No. 52 of 2014.

S.I. No. 98 of 2008- European Parliament and of the Council on waste and repealing certain Directives including amendments Directive (EU) 2018/851.

Waterman Consulting Engineers, 2025. Outline Construction Environmental Management Plan.

Waterman Consulting Engineers, 2024. Engineering Report.

7 HYDROLOGY

7.1 Introduction

IE Consulting were initially engaged by Southern Scientific Ltd on behalf of Rathcool Flying Club to prepare a water chapter for inclusion in an EIAR. The preparation of an EIAR was in response to point 5 of the RFI issued by Cork County Council with regard to planning application 22/06397.

The planning application 22/06397 sought permission for the 'construction of a hard surface runway, taxiway and helipad with associated ground level lighting, associated interceptors along with relocation of existing hangar, paramedic prefab base, crew prefab base all associated with the HSE Air Ambulance, all of which to be serviced by a new proprietary waste water treatment, new vehicle entrance and associated site works.'

The site is at Rathcoole Aerodrome, Knockcahill and Rathcool, Mallow, Co. Cork.

Point 5 of the RFI is as follows:

5. EIAR Required

Given that the proposed runway is stated to extend to c. 799.945m in length, a primary screening for EIA was carried out, where it was concluded that a preliminary examination was required. Following the preliminary examination, it was concluded that based on the nature of the proposed development, its scale which is c. 55cm below the threshold for runways set out under Schedule 5 Part 2 of the Planning and Development Regulations, and its location within a flood zone adjoining an SAC, there is a real likelihood of significant effects on the environment and on this basis, an EIAR is required.

The new planning application 25/04538 was submitted on the 27th of March 2025 which aims to address the reasons for the initial refusal.

The revised development description is as follows:

The construction of a hard surfaced runway (740 m in length) and taxiway (147.6 m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing operations building and paramedic base building to the east of the site, and construction of a new operations and paramedic base building to the west of the site; and the demolition of an existing helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary waste water treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, the upgrade of an existing entrance onto the L-5215-0 road, site landscaping and all other associated site development works. An Environmental Impact Assessment Report (EIAR) has been prepared and will be submitted to the Planning Authority with the application. The EIAR will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy during office hours at the offices of the Planning Authority. A Natura Impact Statement will be submitted to the planning authority with the application. The Natura Impact

Statement will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy during office hours at the offices of the Planning Authority.

A request for further information was issued on the 22nd of May 2025 and requires the Site Specific Flood Risk Assessment (SSFRA) to evaluate the impacts and risks to that service (especially under flooding) in its analysis. Details are provided in Section 7.3.3.2.

This chapter has been revised in response to the initial application refusal, the subsequent new application and the RFI associated with the new application,

The objectives of this section of the assessment are:

- Produce a baseline study of the existing water environment (surface, groundwater and water management) in the area of the proposed development site.
- Identify likely impacts from of the proposed development on surface water and groundwater during the construction and operation phases.
- Identify mitigation measures to avoid, remediate or reduce significant negative impacts.
- Assess significant residual impacts and cumulative impacts of the proposed site operations on the water environment.

7.1.1 Quality Assurance and Competency of Experts

IE Consulting are a specialist hydrological, hydrogeological and environmental consultancy based in Carlow. Established in 2000, IE Consulting provides services in areas of hydrogeology, hydrology, flood risk assessments, contaminated land and drainage design.

They provide specialist consultancy services to a range of clients throughout Ireland, including government departmental bodies, local authorities, group water schemes, developers, local businesses and private individuals.

They routinely complete environmental impact assessments of hydrology and hydrogeology for a large variety of projects including national road schemes, quarries, industrial, residential and agricultural developments.

This chapter of the EIAR was prepared by John Paul Moore and Robert Lachlan McMillan, under the technical direction and supervision of Jerome Keohane. Editorial updates were made by Joanne Mackey.

Jerome Keohane (BSc, MSc, FCIWEM, C. Geol, MIEI, CIWEM), Technical Director IE Consulting is a chartered hydrogeologist with over 40 years' experience in catchment assessment, source protection, groundwater source development/evaluation/protection, water treatment, hydrogeology, nutrient modelling, water quality assessments, contaminated land and project management. Jerome holds a licence to advise An Bord Pleanála on matters relating to planning matters related to hydrogeology. Jerome conducted a final review of a draft of the report, signing off on it as Technical Director prior to submission to the client.

John Paul Moore (BSc, MSc) is a Project Hydrogeologist with over 6 years consultancy experience both in the UK and Ireland. He has experience in both water resource and water quality hydrogeology. John Paul completed all sections of the original draft of the report except for the Section on Flood Risk Identification and also the site visit. The draft was then edited following reviews by Jerome Keohane.

Logan McMillan (BEng (Hons)) is a Project Engineer with IE Consulting with 18 years' experience in hydrology, hydraulic assessments and flood risk assessments. The Section covering Flood Risk Identification was completed by Logan McMillan.

Joanne Mackey (BSc, MSc) is a Project Geologist with over 4 years consultancy experience both in the UK and Ireland. She has experience in both water resource and water quality hydrogeology. Joanne made minor editorial updates and formatting changes only.

7.1.2 Relevant Legislation & Guidelines

This EIAR was completed in accordance with the following legislation:

- Planning & Development Act, 2000, as amended in 2021 and updates 2023;
- The EU Water Framework Directive (WFD), 2000/60/EC;
- The EU Groundwater Directive, 2006/118/EC;
- The EU Floods Directive, 2007/60/EC;
- European Communities (Water Policy) Regulations 2014 (S.I. No. 350 of 2014);
- European Communities (Drinking Water) Regulations 2014 (S.I. No. 122 of 2014);
- Water Services Acts (2007 – 2014);
- European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9 of 2010);
- European Communities Environmental Objectives (Groundwater) Regulations 2016 (S.I. No. 366 of 2016);
- European Communities Environmental Objectives (Surface Water) Regulations 2009 (S.I. No. 272 of 2009);
- European Communities Environmental Objectives (Surface Water) Regulations 2012 (S.I. No. 327 of 2012);
- European Communities Environmental Objectives (Surface Water) Regulations 2015 (S.I. No. 386 of 2015);
- European Communities Environmental Objectives (Surface Water) Regulations 2019 (S.I. No. 77 of 2019);
- European Communities (Quality of Salmonid Waters) Regulations 1988 (S.I. No. 293 of 1988);
- European Union (Water Policy) (Abstractions Registration) Regulations 2018 (S.I. No. 261/2018)

This EIAR was prepared with as per the following guidelines:

- EU Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment.
- EPA (2006), *Environmental Management Guidelines – Environmental Management in the Extractive Industry (Non-Scheduled Minerals)*. Environmental Protection Agency (EPA), ISBN: 1-84095-189-3.
- Environmental Protection Agency (EPA). *Guidelines on the Information to be contained in Environmental Impact Assessment Reports* (EPA, 2022).
- IGI (2013). *Guidelines for the Preparation of Soils, Geology and Hydrogeology Chapters of Environmental Impact Statements*. Institute of Geologists of Ireland (IGI).
- CIRIA (1997). *Oil Containment Bunds*, Report R163.
- CIRIA (2004). *Interim Code of Practice for Sustainable Drainage Systems (SUDS)*.

- CIRIA (2006). *Control of water pollution from linear construction projects*. Technical Guidance.
- CIRIA (2017). *The SUDS Manual*, C753.

7.2 Study Methodology

7.2.1 Desk Study

A desk study of the site was largely completed prior to the undertaking of field work, site walk over assessments and windshield surveys. The desk-based study involved the collection of all relevant geological, hydrogeological, hydrological and meteorological data for the site/wider area. This included the following sources:

- Environmental Protection Agency (EPA) GIS Portal
- EPA Catchment Mapping Portal
- EPA Hydrotool Map Viewer
- Geological Survey of Ireland (GSI) Spatial Resources Viewer
- GSI Groundwater Body Descriptions
- Met Eireann Meteorological Databases
- OPW Indicative Flood Maps and CFRAM Preliminary Flood Risk Assessment Mapping (PFRA)
- National Parks & Wildlife Service (NPWS) Public Map Viewer
- Water Framework Directive Cycle 3 - Catchment Blackwater (Munster) – February 2022.
- Reports relating to previous studies on the site and the River Blackwater SAC.
- Winter Rainfall Acceptance Potential map.

7.2.2 Site Investigations

A site walkover survey of the existing site along with a windshield survey of the wider surrounding area was completed by a hydrogeologist from IE Consulting on 16th of August 2023.

7.2.3 Impact Assessment Methodology

For the purposes of this assessment, the impacts of the proposed development on the surrounding environment, the wider study area includes a 2 km radius from the site. The extent of the wider study area is based on the IGI guidelines, which recommends a minimum distance of 2 km. Where necessary for continuity, the study was extended beyond the 2 km limit, following the precautionary principle.

In addition to the above methodology, the sensitivity of the water environment receptors was assessed using the criteria outlined in Table 7-1.

Table 7-1: Receptor Sensitivity Criteria (adapted from Scottish Environmental Protection Area (SEPA))

Type	Heading
Not Sensitive	Receptor is of low environmental importance. Heavily engineered or artificially modified watercourses which may run dry in the summer months. Fish are sporadically present or restricted. The environmental equilibrium is stable and resilient to changes which are considerably greater than natural fluctuations, without detriment to its present character.

Type	Heading
	No abstractions for public or private water supplies. GSI groundwater vulnerability is of low – medium with a poor aquifer designation.
Sensitive	Receptor is of medium environmental importance or of regional value. Salmonoid species may be present and may be locally important fisheries. Private abstractions for water supply. Environmental equilibrium copes well with all natural fluctuations but cannot absorb some changes greater than this without altering part of its present character. GSI groundwater vulnerability is high with a locally important aquifer designation.
Very Sensitive	Receptor is of high environmental importance or of national or international value e.g., SAC or NHA. Salmonoid spawning grounds present. Abstractions for public drinking water supply. GSI groundwater vulnerability is extreme with a regionally important aquifer designation.

The hydrogeological environment was classified in line with the IGI guidelines, which are outlined in Table 7-2.

Table 7-2: Hydrogeological Environment Classification (IGI, 2013)

Environment Type	Characteristics
Type A	Passive hydrogeological environment e.g., areas of thick low permeability subsoil, areas underlain by poor aquifers, historically stable geological environments.
Type B	Naturally dynamic hydrogeological environments e.g., groundwater discharge areas, areas underlain by regionally important aquifers, nearby spring rises, areas underlain by permeable subsoil.
Type C	Man-made dynamic hydrogeological environments e.g., nearby groundwater abstractions, nearby quarrying or mining activities below the water table, nearby wastewater discharges to ground, geothermal systems.
Type D	Sensitive hydrogeological environments e.g., potentially unstable geological environments, groundwater source protection zones, karst.
Type E	Groundwater dependent ecosystems e.g., wetlands, nearby rivers with a high groundwater component of base flow.

7.3 The Existing and Receiving Environment (Baseline Situation)

7.3.1 Topography & Site Setting

Regionally, the site lies within a NE trending segment of the River Blackwater valley with higher elevations approximately 1km to the north and south of the site. The site is a low-lying flattish area, occasionally undulatory, that is verging on the river to the north (Figure 7-1 and Figure 7-2).

It was noted during the site visit that the ground surface is undulatory within the existing site boundary. The lowest lying areas are adjacent to a stream which runs west-southwest to east-northeast diagonally across the site. The ground slopes gently from south to north to the stream. Then rises gently until the levee adjacent to the River Blackwater which is 1-2 m above the ground surface of the site.

The stream takes drainage from more elevated areas southwest of the site. This drain is culverted beneath the existing grass covered runway. The culverted pipe is approximately 700

mm (approximately 2 ft) in diameter. The stream is also culverted using similar diameter pipes south of the runway.

A long-term member of staff at the aerodrome was able to describe how waterlogging of the low-lying areas occurs. This occurs following heavy persistent rainfall events. Water logging occurs south and north of the stream and occasionally along the lowest part of the runway. This water logging occurs at low-lying areas adjacent to the entrances and exits of the culverts and the diameter of the culverts is a significant contributor to the water logging i.e., a significant limitation to surface water draining away from the runway area. Rainfall also ponds naturally on the low-lying areas however this waterlogging is maintained for longer due to the limitation posed by the sizes of the culvert pipes. A redesign and upgrade of the culverted systems is to be conducted as part of the Proposed Development.

Vegetation is allowed to grow more freely around the stream with for example long grass and ferns evident during the site visit. Ash trees grow along the stream channel northeast of the runway. These are cut every number of years to free up flow along the stream channel.

7.3.2 Proposed Development

The Proposed Development comprises the construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition and building of new structures including the hangar, paramedic prefabricated base, crew prefabricated bases, helipad, vehicular entrance all associated with the HSE Air Ambulance, all of which to be serviced by a new proprietary waste water treatment system and associated site works. Please refer to Chapter 1 of this EIAR for final development description.

The blue dash in Figure 7-1 and Figure 7-2 encloses the area of the Proposed Development. The runway extends beyond the boundary of the existing site.

Following a review of the planning file and a site visit, the following details of the Proposed Development were obtained:

- The runway will consist of hard core overlain by tarmacadam. It will be 18 m wide and 740 m long.
- Its overall dimensions of the strip are 790 m long and 60m. It will extend 30 m from the runway centreline and extended runway centre ie 21 from the edge of the runway. It will extend 30m from each end of the runway.
- At each end of the strip are the Runway End Safety Area (RESA), which are each 30m long and 60m wide.
- Lights will be inserted along the runway.
- The runway will run more southwest to northeast than it is currently i.e., there will be a small change in trend of the runway.
- The Proposed Development will include significant enhancements of the stream culverts within the site, both beneath the proposed runway and otherwise along the stream, so that water runs more freely along the stream channel.

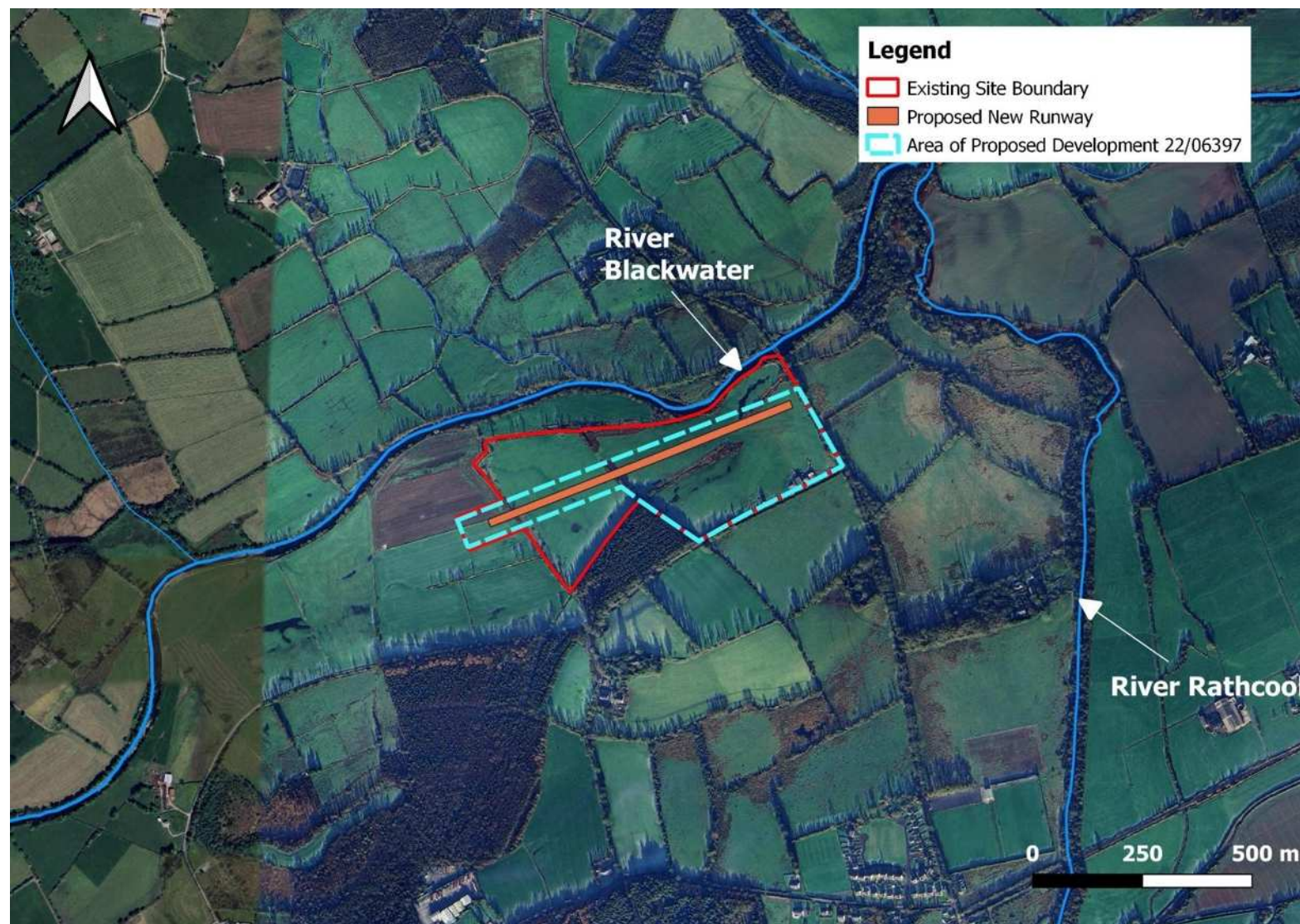


Figure 7-1: Aerial Photograph of the Area Around the Site showing Water Features.

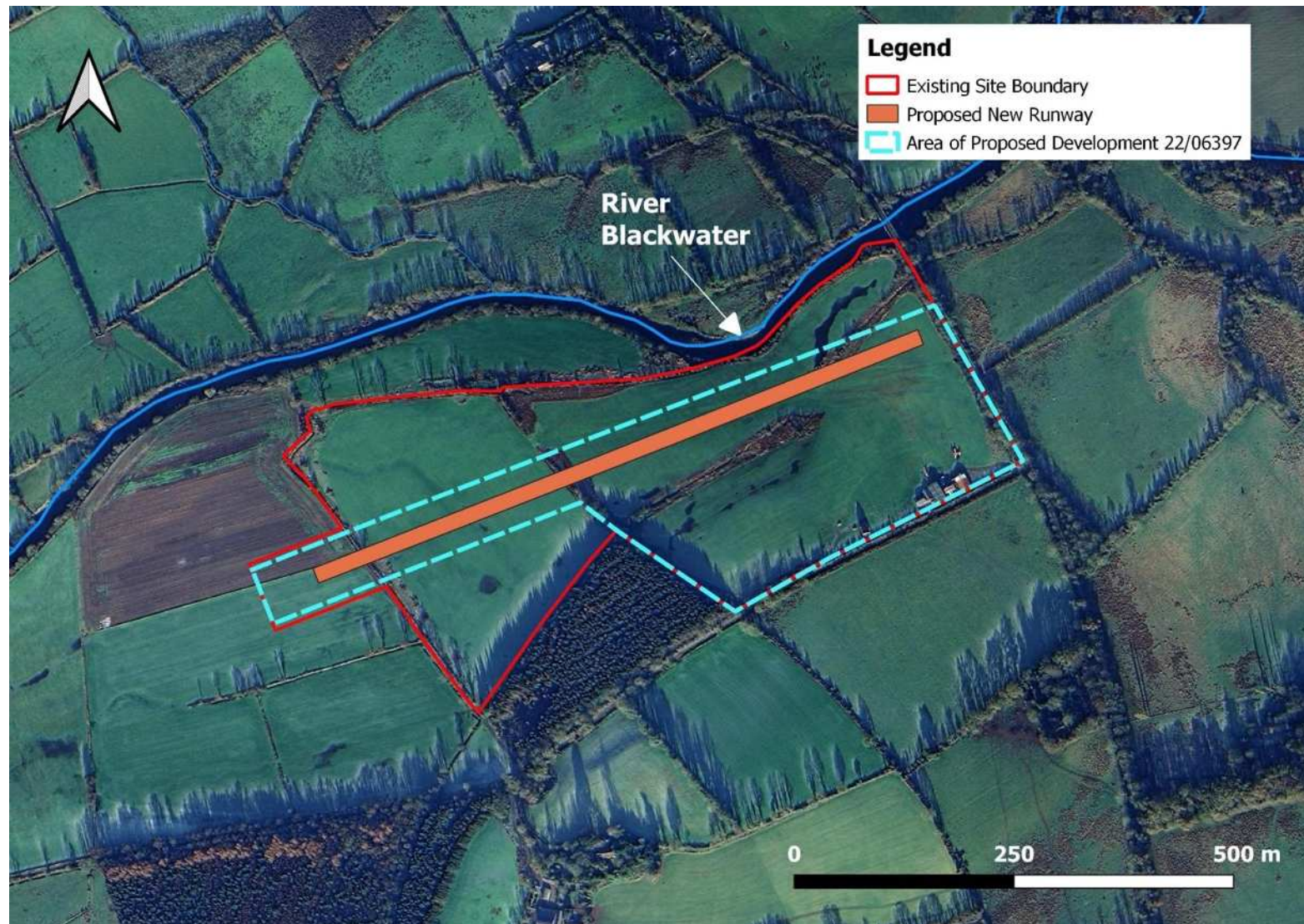


Figure 7-2: Aerial Photograph of the Aerodrome and Immediately Surrounding Land.

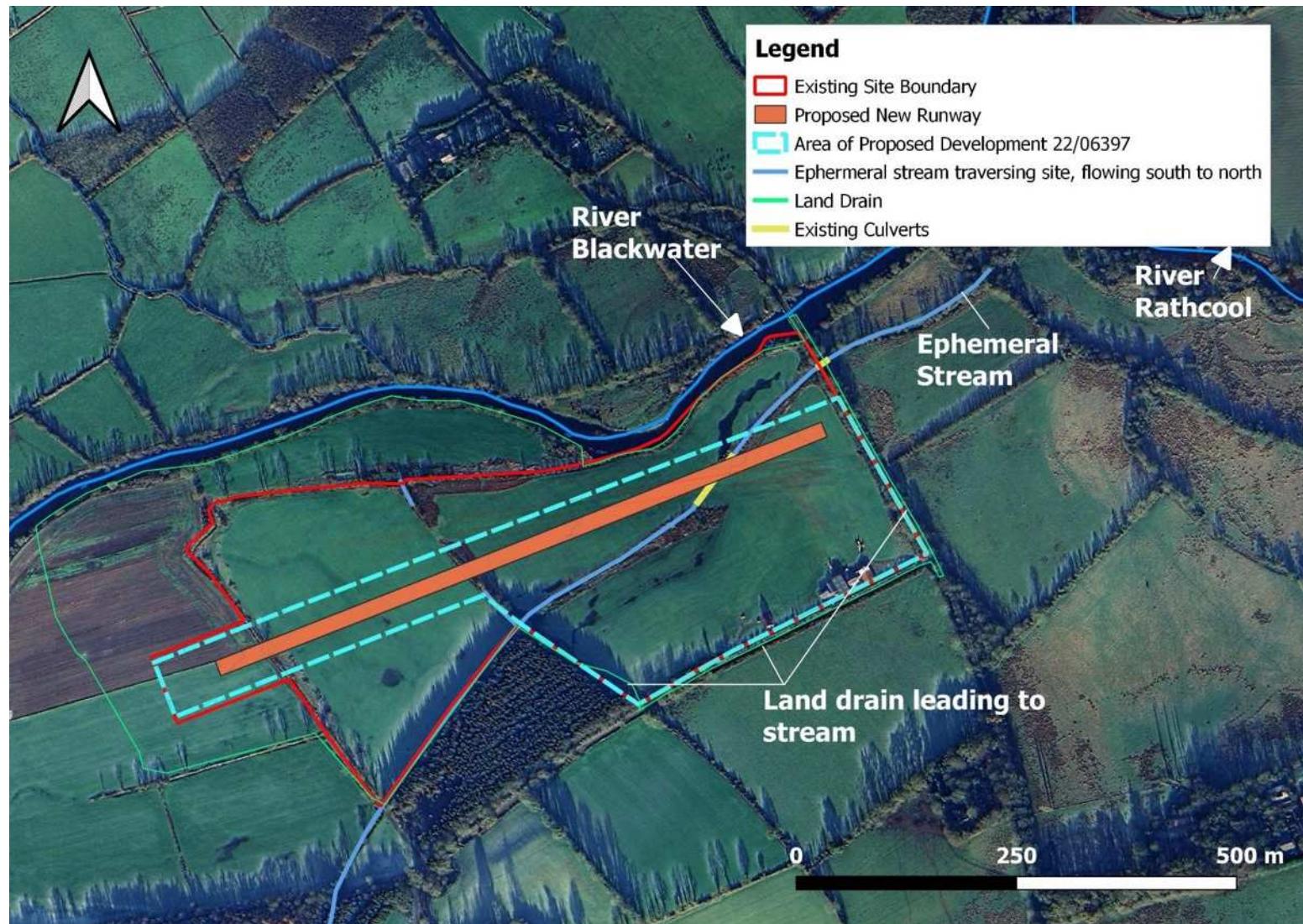


Figure 7-3: Aerial Photograph of the Aerodrome and Immediately Surrounding Land with Water Features Distinguished.

7.3.3 Hydrology

7.3.3.1 Regional and Local Hydrology

Regionally, the site is located in the River Blackwater Catchment (HA: 18) and in sub-catchment of Blackwater (Munster) SC 040 under the Water Framework Directive (WFD).

The northern boundary of the site bounds the River Blackwater. The site is within 368 m west of the River Rathcool which is a tributary of the River Blackwater (Figure 7-3). The area of the Proposed Development is approximately 60 m south of the River Blackwater.

During the site visit the stream running through the site was found to be wet but not flowing. To the southwest and northeast this stream collects flow from drains running north south (Figure 7-3). The stream drains offsite to the east of the site and eventually reaches the River Rathcool within 350 m of the site.

The River Blackwater has overflowed onto the site on at least a couple of occasions since 1985. This overflowing however did not reach the existing runway, with the stream intercepting some of the flow.

7.3.3.2 Flood Risk Identification

To identify those areas as being at risk of flooding OPW's indicative river flood map (www.floodmaps.ie), Department of Environment, Community and Local Government on-line planning mapping (www.myplan.ie) and historical mapping (i.e., 6" and 25" base maps) were consulted. In addition, the NIFM (National Indicative Flood Mapping) extents were consulted to identify any potential flood zones within the general vicinity of the Proposed Development site.

There is no identifiable map text on locally available historical 6" or 25" mapping for the study area that identify lands that are "prone to flooding". There are no recurring flood incidents within the Proposed Development site boundary according to the OPW's flood mapping. There are no areas within the site boundary mapped as "Benefiting Lands". 'Benefiting Lands' are defined as 'land that might benefit from the implementation of Arterial (Major) Drainage Schemes (under the Arterial Drainage Act 1945).

The OPW Preliminary Flood Risk Assessment (PFRA) map for the area, Map no. 62, indicates that the Proposed Development site falls within an indicative 100-year (Flood Zone A) and 1000-year (Flood Zone B) flood zone. There are no pluvial or groundwater flood zones mapped within the site boundary.

In addition, the NIFM (National Indicative Flood Mapping) fluvial flood extent map show that the Proposed Development site is located within the present day and mid-range future scenario 100-year (Flood Zone A) and 1000-year (Flood Zone B) fluvial flood zones.

Overall, the SSFRA (IE2952_Report_6279, Appendix 7-1) concludes that in an extreme fluvial flood from the River Blackwater, the Proposed Development site would incur high flood risk. However, the some areas of proposed site that lies within fluvial Flood Zones A and B for the runway/taxiway, and other parts (hangar, wastewater treatment, prefabs) fall within Flood Zone C. The HSE Air Ambulance hangar, helipad, and associated facilities lie in Flood Zone C. In a major flood of the River Blackwater, if the runway and taxiway are impacted, the air ambulance would instead use the helipad (in Zone C) for vertical take off/landing; the runway/taxiway would not be used under those conditions.

7.3.3.3 Hydrometeorology

The closest synoptic station to the Proposed Development site is at Moore Park, located c. 40 km to the east of the site. Long term average rainfall, temperature and evaporation data was sourced from Met Eireann (<https://www.met.ie/>, Sep 2024). The long-term-average (LTA) reference period is 2011-2023. The climate data is outlined in Table 7-3.

Table 7-3: Climate Data

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Rainfall (mm)	96.1	97.8	76.3	67.0	65.2	74.5	59.6	80.1	75.7	114.3	111.3	133.1	1051.0
Max T (°C)	8.9	9.6	10.9	13.2	15.9	18.5	20.2	19.5	17.5	14.5	11.1	9.8	14.1
Min T (°C)	2.3	2.9	2.6	4.3	7.2	9.7	11.7	10.9	9.3	7.0	4.3	3.4	6.3
PE* (mm)	10.5	18.2	34.3	54.0	76.2	83.4	82.7	69.7	45.2	25.4	12.1	9.8	521.4
*PE – Potential Evapotranspiration													

Going by the LTA values in Table 7-3, December is the wettest month, and July is the driest month. January is the coolest month, while the warmest month is July.

The effective rainfall represents the water available for runoff and recharge to groundwater via infiltration to through the site.

On account of the bedrock and subsoil geology beneath the site the groundwater recharge coefficient mapped by the GSI varies significantly over the site, with values of 8%, 23% and 60%. In particular, the northern part is underlain by a bedrock (Devonian siliclastic rocks) which is considered to have a recharge capacity much less than the limestones underlying the southern part of the site. Most of the site is mapped as overlying a bedrock with a recharge coefficient of 23% and so this value and the higher value (60%) are both used in the simple water balance calculations for the site, below. In this calculation, the remainder of the effective rainfall becomes either surface water run-off or groundwater in the subsoil (over the bedrock).

Site Water Balance	
Annual Average Rainfall (AAR) = 1051 mm	
Potential Evapotranspiration (PE) = 521 mm	
Actual Evapotranspiration (AE) = 495 mm (taken as 95% of PE)	
Effective rainfall = AAR – AE	
Effective rainfall = 1051 – 495	
Effective rainfall = 556 mm	
GSI Recharge Coefficient (Rc) = 23%	
Groundwater recharge = EF x Rc	
Groundwater recharge = 556 x 0.23	
Groundwater recharge = 128 mm/yr	

The remainder of the EF (428mm/yr) becomes either surface runoff or groundwater in the subsoil.

GSI Recharge Coefficient (Rc) = 60%

Groundwater recharge = EF x Rc

Groundwater recharge = 556 x 0.60

Groundwater recharge = 333 mm/yr

The remainder of the EF (223mm/yr) becomes either surface runoff or groundwater in the subsoil.

The Rc is based on the anticipated recharge to bedrock, while the effective rainfall is what is available for runoff over the land surface or infiltration to the subsoil. A groundwater recharge rate of 128 mm/yr or 333 mm/yr applies to recharge to the bedrock. The remainder of the effective rainfall becomes either surface water run-off or groundwater within the subsoil and is estimated above.

Consultation with the Winter Rainfall Acceptance Potential map on the Teagasc Soil Map Viewer finds that the soil type under all the site is of type 4 which signifies that the soil has poor permeability (<http://gis.teagasc.ie/>, 2024). This is consistent with observations in the Site Suitability Assessment (SSA) report. What these features mean is that the during winter period (and periods of prolonged rainfall) when the soil and subsoil is more likely to be saturated there is higher potential for overland flow or surface runoff. With regard to the proposed site, the drainage and in particular the hydraulic efficiency of the stream drain is therefore important for mitigating against surface waterlogging to a significant extent. Currently, anecdotal and observational evidence from the site visit finds that following heavy and persistent rainfall events water does pond on site and that these events also result in backing up of the stream culverts. Therefore, the estimated surface runoff above will be added to significantly from overtopping of the stream. Part of the Proposed Development, however, is to augment the culvert sizes and drainage in general to improve the hydraulic efficiency and to mitigate against the overtopping of the stream.

Note: *The calculation above is a simple water balance based on certain assumptions such as a certain degree of areal homogeneity of effective rainfall and groundwater recharge. Its purpose is to provide a broad, indication of the baseline hydrological characteristics of the area.*

7.3.3.4 Surface Water Hydrochemistry

The EU Water Framework Directive (WFD) aims to improve water quality across all EU member states. Surface water features, such as rivers, lakes, estuaries and coastal waters, are assigned one of five categories of status, based on the results of a chemical and ecological assessment. The five category statuses are as follows: High (top rank); Good; Moderate; Poor; and Bad (lowest rank).

The River Waterbody WFD Status 2016-2021 for the River Blackwater including its tributary the River Rathcool is 'Good'.

The River Blackwater including its tributary the River Rathcool are designated 'At Risk' under the WFD River Waterbodies Risk designation.

In the 3rd Cycle Draft Blackwater (Munster) Catchment Report (HA 18) the issues and pressures in the catchment are summarised as follows:

- The main significant issues are impacts from nutrient pollution, followed by morphological issues, organic pollution, hydrological impacts and sediment.
- The main significant pressures are agricultural pressures followed by forestry and hydromorphological pressures.
- There has been an overall improvement in terms of status change. The numbers of waterbodies impacted by nutrient, morphological issues and hydrological impacts have reduced however the number of waterbodies impacted by organic and sediment issues from agricultural pressures have increased.

The increase in number of waterbodies impacted by agricultural pressures appears to be the most significant concern in the catchment.

7.3.3.5 Designated Sites and Habitats

Natura 2000 is a European network of core breeding and resting sites for rare and threatened species, and some rare natural habitat types. Natura 2000 sites are designated as Special Areas of Conservation (SAC) or Special Areas of Protection (SPA).

There are two Natura 2000 sites mapped on or within 5 km of the Proposed Development site:

- The River Blackwater SAC bounds the northern margin of the site and is within 254 m of the eastern boundary of the site where it encompasses the River Rathcool;
- There is one other SAC that appears linked with the River Blackwater SAC and it is 4.3 Km northeast of the site, and that is the area encompassing Banteer Natural Park.

7.3.3.6 Hydrological Conceptualisation

Rainfall onto site will either pond, infiltrate to subsoil or to subsoil and bedrock, flow into the stream running through the site or into the drains along the borders of the site.

The stream drains eastward to the River Rathcool.

There is evidence indicating that the proposed development site may face potential flood risks as the area of the site where the new runway and taxiway are proposed falls within a delineated fluvial Flood 'Zone A' and 'Flood Zone B'. The areas known to flood were indicated to the hydrogeologist during the site visit with historical flooding found to come from two sources: the overtopping of the stream drain and much less frequently but nonetheless a risk, overtopping of the River Blackwater, during heavy and prolonged rainfall events. However, it is noted that the SSFRA concluded that the development does not pose an adverse impact on the hydrological regime of the area or increase in flood risk elsewhere and is deemed appropriate from a flood risk perspective. Also, the air ambulance is not strictly dependent on the runway. While in normal conditions it would use the runway and taxiway, in an extreme flood event it would utilise the helipad (for vertical takeoffs/landings) located in Flood Zone C.

River Blackwater has overtopped its banks onto the site twice since the 1980s and according to the Site Specific Flood Risk Assessment (SSFRA) (Appendix 7.1) part or over half of the Proposed Development site is within an area at risk of flooding based on the 1 in 100 year and 1 in 1000 year flood events scenarios according to OPW and NIFM mapping (IE Consulting, 2024). In fact, both the 1 in 100 year and 1 in 1000 year scenarios are very similar for the area. Historical flood events are associated with overtopping of the River Blackwater at Colthurst Bridge (OPW) but also the area associated with the historical flooding extends over most of the Proposed Development area ('Winter 2015/2016 Surface Water Flooding') including the

location of the proposed runway. Looking at the map in Figure 7-4 the main area indicated under historical flooding associated with 'Winter 2015/2016 Surface Water Flooding' and which occurs within the proposed site, is separate from the River Blackwater and could well be associated with backing up of the stream drain. This is consistent with information provided and observations made during the site visit that the main threat (the highest risk) to the Proposed Development with regards flooding is from overtopping of the stream drain due to the size of the culverts. Significant enhancement of the culverts is part of the Proposed Development.

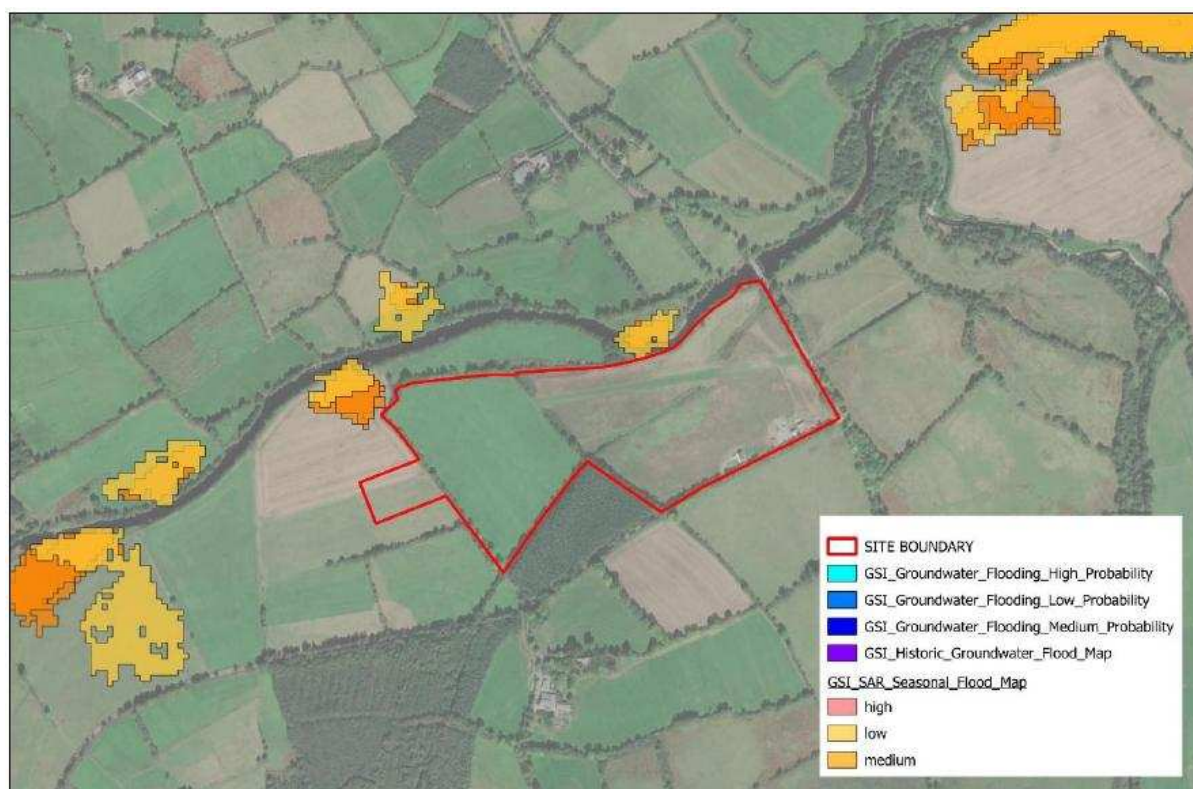


Figure 7-4 GSI Groundwater Flood Mapping (IE Consulting, 2024)

7.3.3.7 Hydrological Receptor Sensitivity Assessment

By screening in and out, this focuses resources on understanding potential impacts on the most relevant receptors, improving the efficiency of the assessment. Based on hydrological connectivity of the pathway to the specified receptors the following features are screened in/out (Table 7-4). Only features which are categorised as "Screen In" will be focused on as a potential impact in the subsequent sections.

Table 7-4 Hydrological Receptor Sensitivity

Feature	Sensitive	Screen In/Out	Justification
River Blackwater	Very sensitive	Screen In	Receptor is of high environmental importance. It is an SAC. There are indirect pathways to the receptor via surface water (onsite stream flows to the River Rathcool which then flows into River Blackwater and onsite and bounding drains flow to the River Blackwater) and indirect via

Table 7-4 Hydrological Receptor Sensitivity

Feature	Sensitive	Screen In/Out	Justification
			groundwater in the Alluvium hydraulically connected to the River Blackwater.
River Rathcool	Very sensitive	Screen Out	Receptor is of high environmental importance. It is an SAC. There are direct pathways to the receptor via surface water in the stream and indirect pathways via groundwater in the Till. There is an indirect pathway via groundwater in Karstified fractures in the bedrock, however the proximity of the site to the River Blackwater means the main risk is the main river.

7.3.4 Surface Water Management within proposed development

The proposed relocated Air Ambulance base, including helipad, runway, and associated buildings, plus intensification of activities on site represents a moderate intensification of land use. However, it is designed with appropriate and proportionate water management strategies to protect both surface and groundwater resources.

7.3.4.1 Site Drainage

In the proposed development the impermeable area of the site will be increased through the development of the helipad, the runway and the buildings associated with the development including the hangar for the helicopters.

Any surface water will either pond, infiltrate or make its way to the drains surrounding the site and the stream running through the site (Figure 7-3).

Following on from Section 7.3.3., the site drainage is critical for alleviating ponding or water logging water because of the soil permeability at the site. The drains bounding the site are capable of taking local surface water runoff without over-topping but the stream drain running through the site backs up frequently during heavy and prolonged rainfall events. A redesign of culverts associated with the stream drain will aid significantly in reducing the risk of flooding at the site.

Surface water will therefore be managed through existing perimeter drains and a culvert redesign to prevent ponding and reduce flood risk. These measures are appropriate given the site's limited soil permeability and the known performance of the stream drain during heavy rainfall.

7.3.4.2 Water Supply and Use On-site

The site is not served by the Uisce Éireann mains network. All water used onsite is sourced from an onsite production well that was drilled in 2016. According to the site owner, the borehole depth is reported to be 48 feet (approximately 15 m) below ground level (mbgl). However, the driller's log was not available to confirm the well specifications. The well is used for drinking water supply and will be used for drinking water supply for the proposed paramedic prefab base and crew prefab base all associated with the HSE Air Ambulance.

Water Usage for Kitchenette and Toilets

The groundwater supply well will be used for drinking water in the kitchen of paramedic prefab base and crew prefab base and will remain use in the kitchen in the Rathcool Flying Club Clubhouse onsite.

There will be maximum of 6 staff using the facilities associated with the proposed development (associated with the HSE Air Ambulance). Generally, there will be two paramedics, two pilots plus an engineer onsite; with a security person at night. With an assumed drinking water usage of 3 litres per person per day, the daily volume of water used in the kitchenette is estimated to be 0.018 m³/d. However, the pilots (2) and paramedics (2) may not always be onsite.

The groundwater supply well will continue to be used by the Rathcool Flying Club which has a maximum of four people using the flying club facilities (kitchenette and toilet), however this will be just every weekend when the weather is suitable.

As regards toilet usage, based on the above staff number and EPA Wastewater Treatment Manuals (allowance of 60 litres per person per day), a maximum daily allowance of 360 litres (0.36 m³/d) was estimated. This value therefore represents a maximum potential water usage for the toilets of the proposed development.

Washing

No washing of helicopters, aeroplanes or other equipment will be conducted onsite.

The site is self-sufficient, using an existing groundwater well. Daily water demand remains low, with a maximum estimated use of 0.378 m³/day for drinking and toilet facilities. Actual usage will often be lower due to intermittent staffing and limited weekend use by the flying club. Importantly, the modest intensification of use does not significantly increase demand and remains well within the sustainable yield of the borehole.

7.3.4.3 Wastewater Treatment

The development will be serviced entirely by a new waste water treatment system. The SSA report for the planning application recommends a tertiary waste water treatment system which will include a percolation area. The system will extend out from the northwest corner of the Operations Hut and will be 95 m from the stream and 220 m from the River Blackwater.

The existing waste water treatment system located just west of the existing hangar will remain in use for the Clubhouse only, by the Rathcool Flying club. According to the Site Characterisation Form in the planning application no.: 155370 (Cork County Council, granted 25/06/2015), the system includes a tertiary treatment system with a 180 m² polishing filter. The system was installed by a qualified professional, with annual desludging and periodic pumping as part of its ongoing maintenance.

By introducing a separate system for the new development, the intensification of site use is effectively decoupled from the existing Rathcool Flying Club system, which continues to operate solely for the clubhouse and weekend users. This separation will help to prevent cumulative loading on the existing treatment system, ensure regulatory compliance through adequate separation distances from watercourses and provide sufficient capacity and treatment quality to safely manage the wastewater from the new operational buildings.

As a result, the modest intensification of site use is well accommodated within the proposed infrastructure, without creating pressure on existing wastewater facilities or increasing environmental risk.

7.3.4.4 Environmental Management

The operation will simply extend to the north (Figure 7-2), with the current onsite facilities continuing to service the development. The facility will have the following procedures in place to deal with the use of potential contaminants onsite, with respect to the water environment:

- The only fuel to be stored onsite associated with the proposed development will be that in mobile bowser that will be used to refuel the helicopter. This bowser is double skinned and is filled from a mobile bowser that is brought onsite every two weeks.
- The helicopter will be refuelled on the helipad and concrete pad purposely built for landing and take-off the helicopter.
- Fuel samples are stored in a bunded cabinet in the helicopter hangar.
- Chemicals associated with the helicopter maintenance will be stored in a bunded cabinet.
- A tertiary waste water treatment system as part of the proposed development.

The implementation of strict environmental controls as listed above ensures that the modest intensification of site activity does not increase the risk of water contamination. Although the site will see more regular helicopter operations due to the HSE Air Ambulance, the fuel handling and storage protocols are designed to contain and manage all potential pollutants, regardless of increased frequency of use.

7.3.5 Hydrogeology

7.3.5.1 Bedrock geology and groundwater

The GSI mapped bedrock geology in the area of the proposed development site, is outlined in red in Figure 7-5. The site is mapped as straddling the faulted contact between bedrocks of different distinguished ages, Dinantian (Early Carboniferous) Limestone (undifferentiated) underlies a stripe of the southern margin of the site and southward dipping thrust separates the rocks of Westphalian (Late Carboniferous) age (undifferentiated; GSI, 2023) underlying the remainder of the site. The former is summarised as just Dinantian Limestone while the latter is summarised as consisting of grey shale, thin siltstone & sandstone (GSI, 2023).

The mapped NE trending thrust is characteristic of the area and is associated with Variscan approximately N-S compression. Variscan deformation is often associated with folds of similar trend to the thrusts, particularly in this part of Ireland (Graham, 2009¹).

The NE thrusts are mapped as being offset by NW and NNW trending strike-slip faults which could be associated with the Variscan Orogeny or Cenozoic strike-slip faulting or the localisation of both².

There is likely to be dissolution and karst associated with the Dinantian Limestone.

Karst forms in carbonate bedrock where rainwater that is slightly acidic dissolves the bedrock over time. The dissolution of the limestone bedrock results in unique features such as swallow

¹Graham, J.R. (2009) Variscan deformation and metamorphism in Holland, C.H. & Sanders, I.S. (eds) *The Geology of Ireland*, 2nd edn. 295-310.

²<https://link.springer.com/article/10.1007/s10040-021-02395-z>

holes, caves or enclosed depressions. The GSI Karst Database was consulted, and there is no karst mapped in the area of the site. The sub-crop mapping of the Limestone is however broadly coincident with the NE trending U-shaped valley along which the local section of the River Blackwater runs with the more elevated areas to the north and south associated with Later Carboniferous and Late Devonian siliclastic rocks respectively. In addition, there are karst springs associated with faulting in the Dinantian Limestone within 10km southwest of the site.

Groundwater flow in the bedrock is likely to be along faults and fractures in both rock types mapped under the site and/or karstified pathways in the limestones.

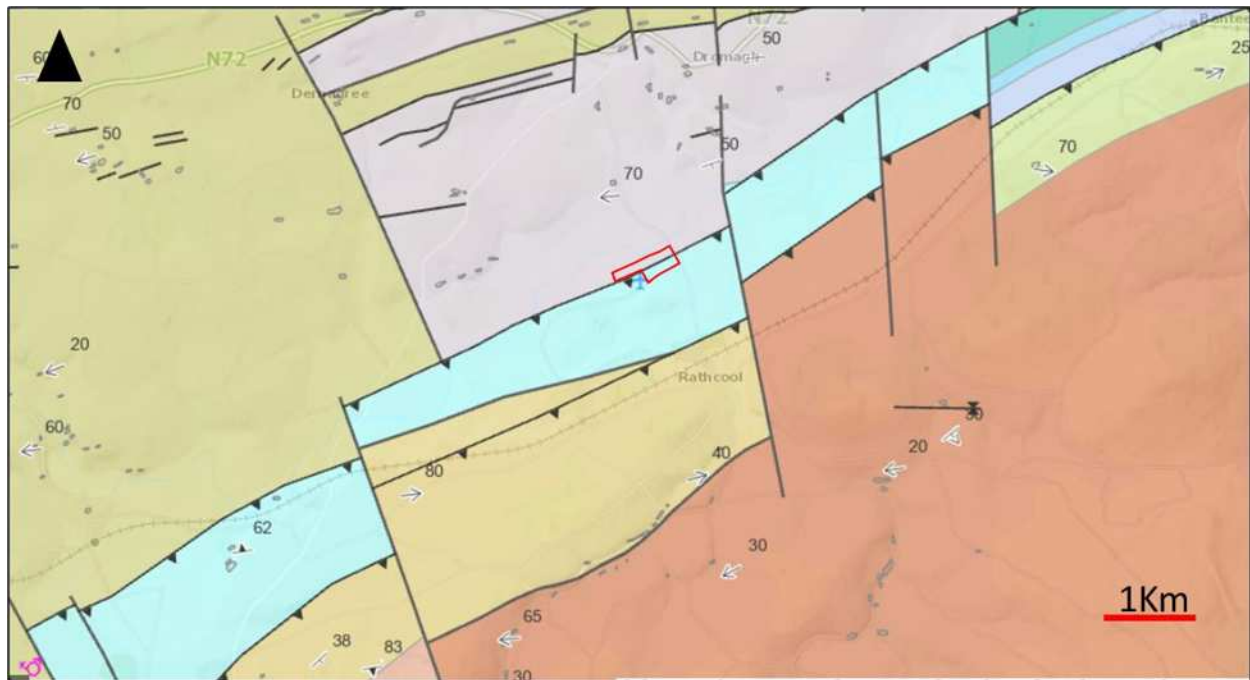


Figure 7-5: GSI mapped bedrock geology in the area of the proposed development site, outlined in red (GSI, 2023).

Groundwater body mapping

As a result of the site straddling the contact of two bedrock formations, the site is located on the boundary of two GSI mapped Groundwater Bodies (GWBs)³, which are discussed below.

a. Northern part of the site

The Rathmore West GWB (IE_SW_G_070) covers approximately two thirds of the site.

The GWB designation primarily is based on Namurian sandstones and Westphalian shales in the area with two small areas of Dinantian pure bed limestones.

The corresponding aquifer designations are mainly (95%) Locally Important Aquifer which is moderately productive only in local zones. The remainder is mapped as Poor Aquifer.

b. Southern part of the site.

³<https://gis.epa.ie/EPAMaps/>

The Banteer GWB (IE_SW_G_018) is mapped beneath the southern part of the site, corresponding with the mapped Dinantian Limestone.

The aquifer classification corresponds with the lithology:

- Dinantian Pure Unbedded Limestones (Waulsortian Limestone Formation & area of undifferentiated Dinantian) (75% - 14 km²) - Regionally important karstified aquifer dominated by diffuse flow.
- Dinantian Lower Impure Limestones (8% - 1 km²) - Locally important aquifer which is moderately productive only in local zones.
- Dinantian (early) Sandstones, Shales and Limestones (17% - 3 km²) - Poor aquifer which is generally unproductive except for local zones.

The karst springs can have high flows with two in particular noted from the GSI spring and well database:

- Tubrid (Millstreet WS) – a High Spring, yield claimed to be 2637 m³/d (Cork Co. Co.)
- Poulgorm Spring (Banteer WS) – Intermediate Spring

7.3.5.2 Subsoil geology and groundwater.

Alluvium underlies most of the site, with the southern margin of the site mapped as underlain by 'Till derived chiefly from Devonian sandstones' (GSI, 2023; Figure 7-6).

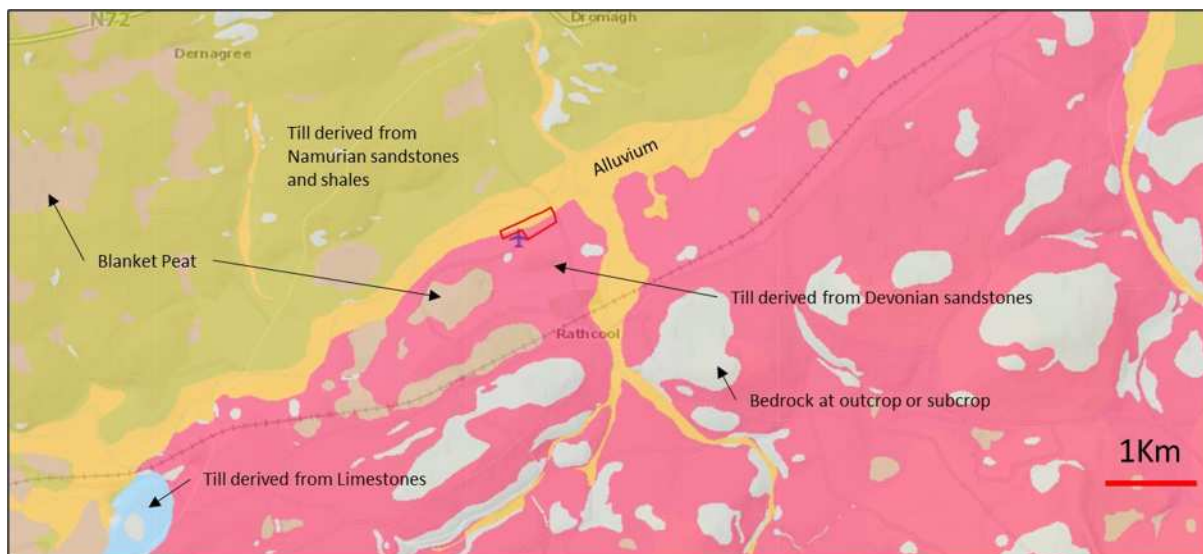


Figure 7-6: Quaternary sediments in the area of the proposed development as mapped by GSI (2023).

The soil and subsoil geology encountered during excavations of the trenches for the SSA report is shown in Table 7-5. Groundwater was not encountered. The trenches were to 3 m. There was 1.7m of CLAY encountered which has implications for contaminant transport: it is the principal reason a tertiary waste water treatment system is recommended for the proposed development (SSA report); the clay reduces vertical infiltration and will mitigate migration of any hydrocarbon contamination.

Table 7-5: Trial Pit Information

Item	Details
Depth of Trial Hole	3.0 m
Depth Bedrock Encountered	Bedrock not encountered
Soils / Subsoils Encountered	0.0m bgl – 0.4m bgl: Non-dilatant, crumb, uncompacted brown SILT with rootlets. 0.4m bgl – 2.1 m bgl: 'Firm compact brown or grey CLAY with a mixture of stone and silty clay towards 2.1m.' 2.1 m bgl – 3.0 m bgl: Granular, blocky compact brown or grey SAND.
Groundwater Encountered	No. 'The clay horizon appears of poor soil permeability. No evidence of flow paths or ingress or mottling'.

7.3.5.3 Groundwater Resources

A desk-based review of abstractions listed on the GSI Spatial Resources Viewer was conducted. There is generally a relatively low density of wells and springs in the wider area. Based on the GSI website, the nearest well to the site is 4.2 km northwest of the site (1109SEW005). It is designed to abstract from subsoil and is 37.2 m deep. Along the valley containing the site, the nearest well is 6Km northeast, at Banteer. It is 42.7 m deep and abstract from the bedrock for agri-domestic purposes. Its yield is 27.2 m³/d.

The nearest public water supply (PWS) source protection zone is 20.5 km northeast of the site, the Mountnorth RWSS. After that the Oliver Cross PWS is 25 km northeast of the site. The distances group water scheme wells (GWS) are even greater (in excess of 30 km).

By virtue of the distances, all domestic wells, PWS wells and GWS wells outside the site can be screened out.

There is a groundwater well onsite currently supplying the Rathcool Flying club buildings and the HSE Air Ambulance buildings. This well will also supply the proposed development. This well is reported to be 48 feet (approximately 15 m) deep and was installed in 2016. Drilling of the well is reported (flying club staff member met onsite) to have encountered gravel above limestone rock which is consistent with respect to the mapped geology. There is reported to be steel liner to 12 m below ground level to the top of bedrock, with the well open for 3m into bedrock. The water from the well is treated using UV.

The well is approximately 150 m east of the current wastewater system and percolation area for the HSE Air Ambulance buildings and aeroclub buildings. This treatment system consists of a septic tank and percolation area to the north of it. The Proposed Development (for the HSE Air Ambulance) will have a new proprietary waste water treatment system. With the current wastewater system onsite to remain operational for the flying club staff facilities.

7.3.5.4 Groundwater Vulnerability

The GSI has mapped groundwater vulnerability across Ireland based on the thickness and relative permeability of the subsoil. The resulting map therefore gives an indication of the risk of contamination of bedrock or subsoil aquifers from contaminants arising from vertically above the aquifer. For example, bedrock with a thick, low permeability, clay-rich overburden is mapped as less vulnerable than bedrock with a thin, high permeability, gravelly overburden.

The groundwater vulnerability is mapped under five categories – Rock at or near surface or karst (X), Extreme (E), High (H), Moderate (M) and Low (L). The GSI groundwater vulnerability classification scheme is outlined in Table 7-6.

Table 7-6: Groundwater Vulnerability Classification

Depth to Rock	Hydrogeological Requirements for Groundwater Vulnerability				
	Diffuse Recharge			Recharge Point	Unsaturated Zone
	High Permeability (Sand/gravel)	Moderate Permeability (Sandy subsoil)	Low Permeability (Clayey subsoil, clay, peat)	(Swallow holes, losing streams)	(sand & gravel aquifers <u>only</u>)
0-3 m	Extreme	Extreme	Extreme	Extreme (30 m radius)	Extreme
3 – 5 m	High	High	High	N/A	High
5 – 10 m	High	High	Moderate	N/A	High
>10 m	High	Moderate	Low	N/A	High
<i>i. N/A = not applicable.</i> <i>ii. Release point of contaminants is assumed to be 1 – 2 m below ground surface.</i> <i>iii. Permeability classifications relate to the engineering behaviour as described by BS5930.</i> <i>iv. Outcrop and shallow subsoil (i.e., generally <1.0 m) areas are shown as sub-category of extreme vulnerability.</i> <i>(Amended from Deakin and Daly (1999) and DELG/EPA/GSI (1999))</i>					

The GSI Groundwater Vulnerability is mapped as moderate under most of the site, mostly coinciding with the alluvium subsoil over bedrock (Figure 7-7). The southeast corner of the site is mapped as Low Vulnerability due to thicker subsoil of lower permeability. The well is in this part of the site, however the staff member met onsite recalls the subsoil was 12m thick and consisted of 'gravel', which would suggest a high vulnerability as per Table 7-6. However, based on maps associated with the Winter Rainfall Acceptance Potential and the logged geology in the SSA report there are clay horizons towards the top of the subsoil. These will reduce the vulnerability of the bedrock with moderate a more reasonable estimation of the groundwater vulnerability based on Table 7-6 and available data.

Immediately bounding the site to the south-southwest is an area of high to extreme to rock at or near surface, probably coinciding with a hill derived from differential dissolution of the limestone. There is a second area of extreme vulnerability southeast of the site, probably also related to differential weathering of the limestone.

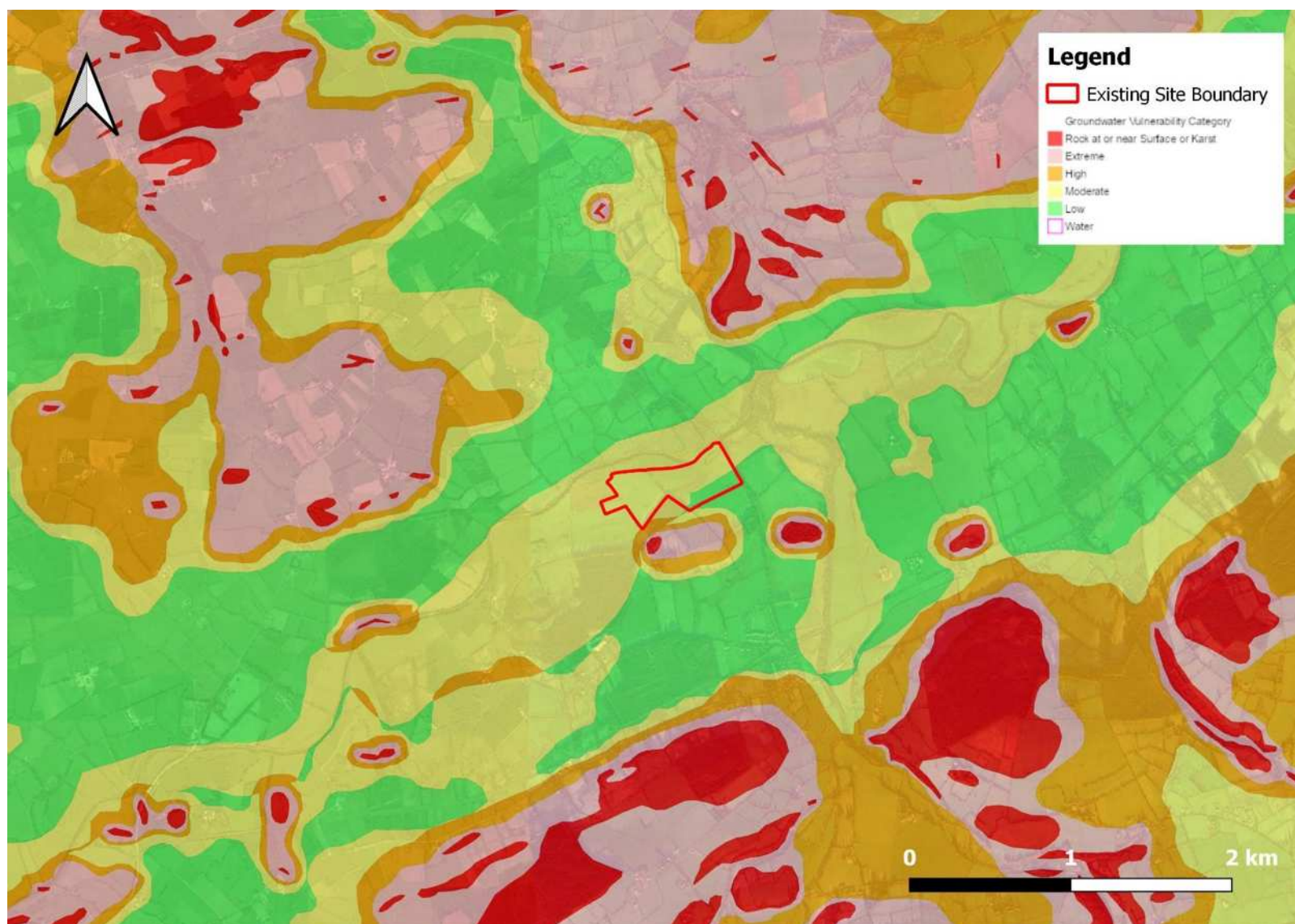


Figure 7-7: Groundwater Vulnerability in the Vicinity of the Proposed Development (Red Outline) as Mapped by the GSI (2025)

7.3.5.5 Groundwater Hydrochemistry

The EU Water Framework Directive (2000/60/EC) (WFD) establishes a framework for the protection, improvement and management of surface water and groundwater. The overall aim for groundwater was to achieve at least 'good quantitative status' and 'good chemical status' by 2015, as well as preventing deterioration in those waters that have been classified as 'good' status. Groundwater has just two statuses – Good and Poor.

The regional groundwater body status was obtained from the EPA Catchments portal. In addition, the EPA Catchments unit lists pressures that the GWB's are experiencing.

The Rathmore West and Banteer GWBs were both assigned a 'good' status for the 2016-2021 monitoring period, while they are listed as 'not at risk' of achieving good status in the next monitoring round.

No significant pressures were assigned to each of the GWBs encompassing the site, as of July 2023.

7.3.5.6 Hydrological and Hydrogeological Conceptual Model

A conceptual cross section for the site (including the permitted quarry extension area) is shown in EIAR Figure 7-8 and Figure 7-9. An outline of the conceptual model in terms of the potential sources, pathways and receptors is detailed further below following a broad description here:

Surface water flows intermittently along the drains and the stream towards either the River Rathcool or River Blackwater, however the River Rathcool also flows into the River Blackwater within 500m of the site. Culverts in the stream, which include one beneath the current runway, limit stream flow during heavy rainfall events resulting in surface water overtopping out on to the ground surface of the site and sometimes onto the current runway which is grass covered. Rainfall also causes ponding directly on the ground surface. Part of the works associated with the Proposed Development include the enhancement of the culverts which will result in less overtopping and ponding.

Surface water may also infiltrate to subsoil however the clayey and silty nature of the soil may mean the shallow subsoil will become saturated more easily than an alluvial only soil and subsoil and surface water runoff a common feature of the site. As such water-logging and surface water runoff is an important feature as observations at the site and anecdotal evidence are testament to. But the clayey soil also means vertical hydraulic connectivity and contaminant transport to the deeper alluvium and the shallow bedrock is significantly retarded which will mitigate against impact at the onsite groundwater abstraction well from waste water treatment systems and any potential hydrocarbon spills.

The shallow clays mean the groundwater vulnerability is probably more likely moderate rather than high due to evidence of clayey nature of the shallow soil and subsoil. Assuming the steel liner was installed to standards i.e. to competent bedrock there may not be a pathway to the groundwater supply wells under normal conditions.

However, a further water quality risk to the bedrock supply well, which is only three metres into bedrock, is from severe flooding of the River Blackwater which may result in backing up of the River Rathcool and onsite stream. The River Blackwater is reported to have overtopped the levee and onto the site on two occasions since the 1980s. There is the possibility that the top of the subsoil and the stream are sort of perched relative to the River Blackwater. For

example, anecdotal information provided on the site visits highlighted how often the stream overtops relative to the River Blackwater which mostly has a stage of below ground level on occasions when the stream is overtopping on the site ground surface. The levee on the southern bank of the River Blackwater also means it is less likely to overtop unless there is an extreme (1 in 100 or 1 in 1000; Appendix 6.1) rainfall event compared to flooding via the stream. It is possible therefore that the historical flood event shown on Figure 8 of the FRA ('Winter 2015/2016 Surface Water Flooding') which is mainly separate from the River Blackwater reflects backing up and overtopping of the stream rather than deriving from the River Blackwater itself. The frequency and extent of ponding of surface water onsite can be significantly reduced through adequate enhancement of the culverts on the stream which is part of the proposed development. The well head protection is significantly good to mitigate against the impact of a flood event.

Groundwater in the subsoil beneath the site maybe conveyed to the drains or to the River Blackwater. Groundwater in the subsoil may also infiltrate to bedrock. The bedrock beneath the site varies significantly in its ability to convey groundwater: the Dinantian limestones underlying the southern part of the site will likely have Karstified fractures and therefore flow rates are potentially higher than via the fractures of the siltstones, sandstones and shales of the Westphalian rocks beneath the northern part of the site. The well is the limestones in the southern part of the site.

Sources

Sources of potential contamination on site are:

- Effluent from wastewater treatment system.
- Any hydrocarbons (grease, oil, fuel) from aeroplanes and vehicles that enters surface water and groundwater, particularly from refuelling area (helipad) and storage areas (mobile bowser).

Pathways

Potential pathways to receptors are:

- Runoff from helipad will be put through oil/fuel interceptors but all may not be contained and could reach ground surface where it will either pond for a time or infiltrate into groundwater, and then over time reach the River Blackwater and bedrock, via shallow groundwater
- Spill or leakage from mobile bowser, parked adjacent to the helipad on a hardcore surface, infiltrates to groundwater.
- Pathway of hydrocarbons or effluent via groundwater in gravel to onsite well open to the top of the bedrock.
- The car park surface is a hard core surface meaning any leaking oil may reach groundwater.

Receptors

The receptors likely to be hydraulically connected to the site are:

- Onsite abstraction well for drinking water.
- River Blackwater and associated qualifying interests.

- Potential future users of the groundwater resource in the vicinity of the site, particularly in the Dinantian Limestone.

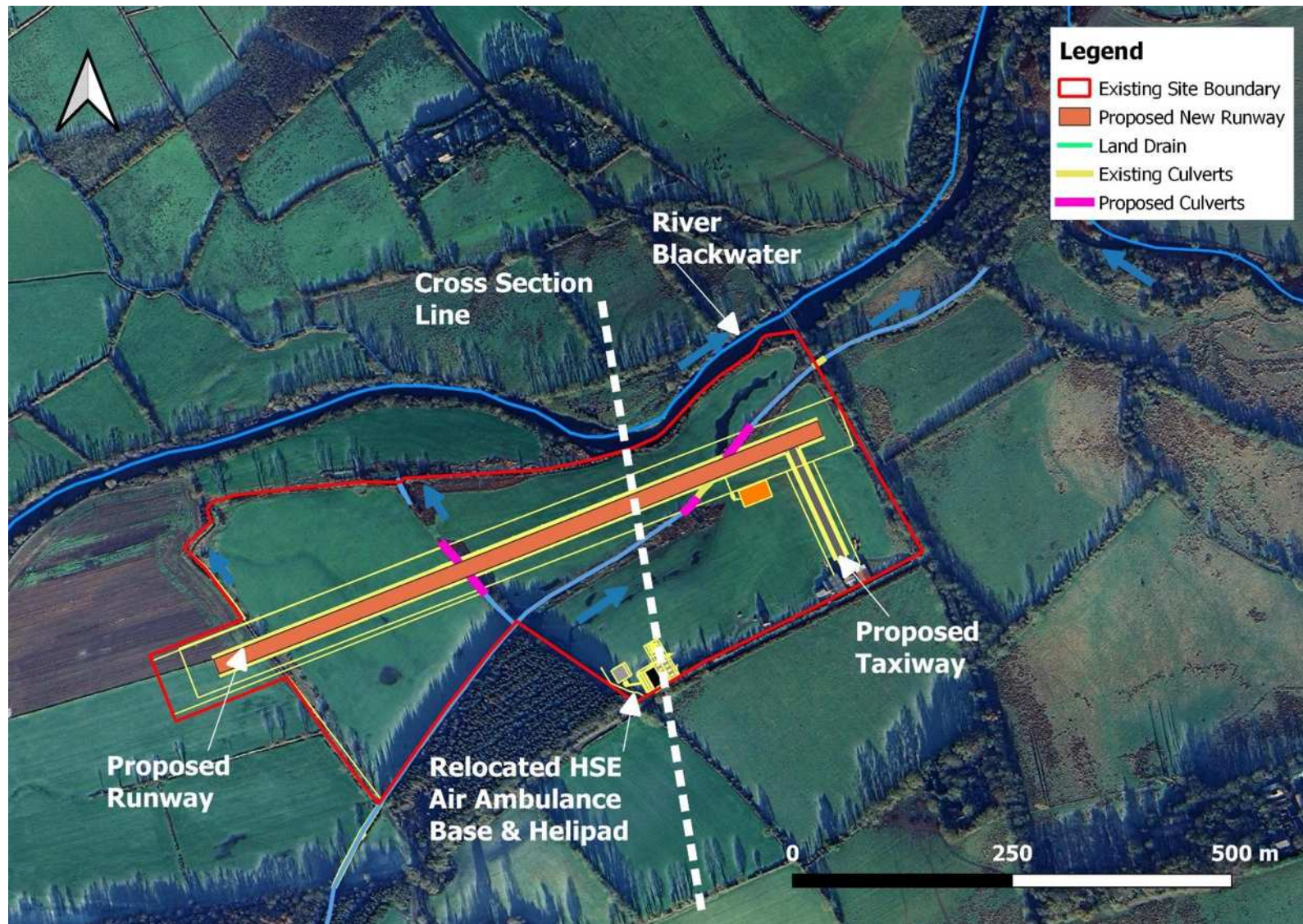


Figure 7-8: Site conceptual plan (aerial view) showing landscape context and proposed layout.

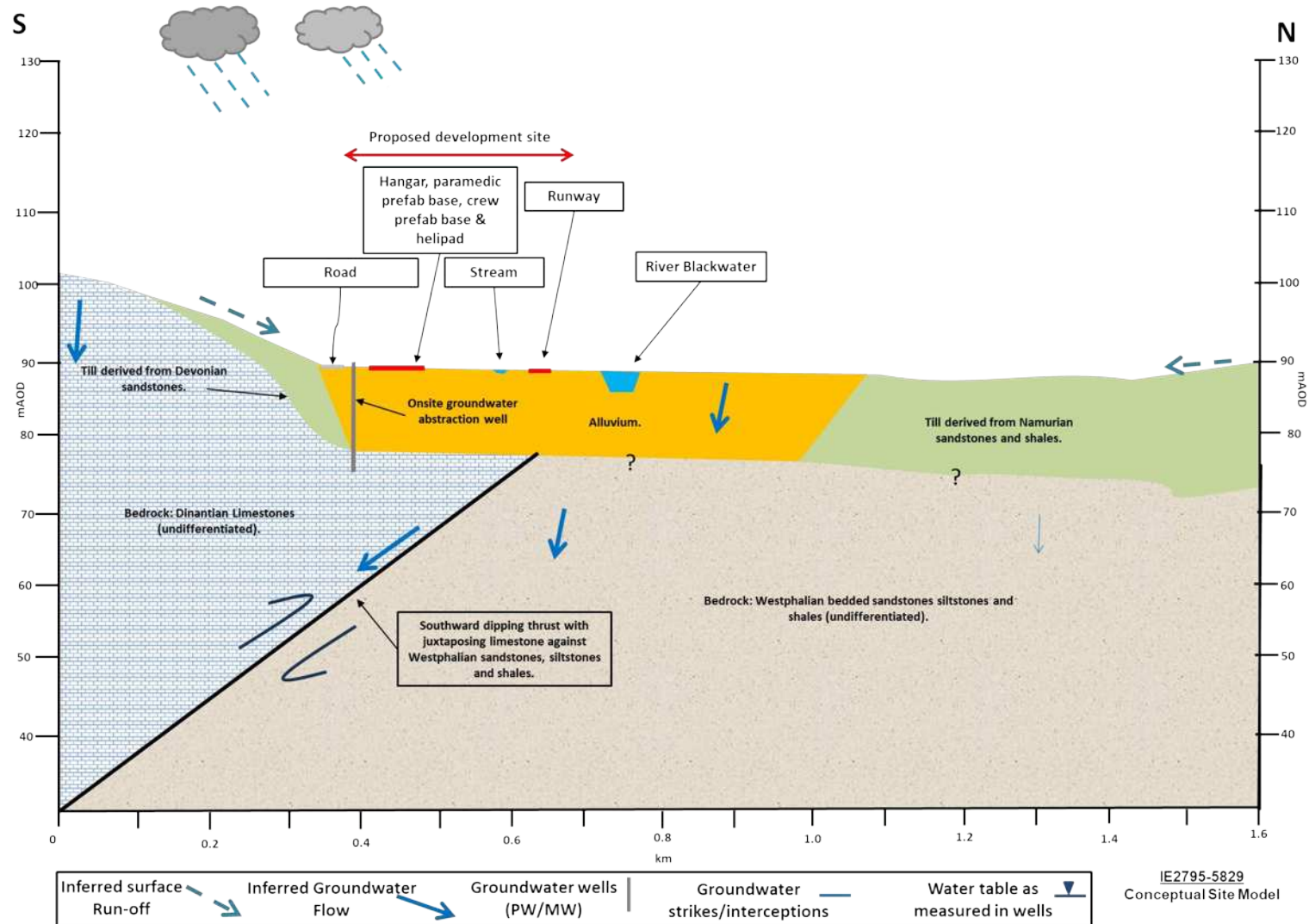


Figure 7-9: A South to North Conceptual Cross-Section showing Water going from Rainfall via Potential Pathways to some of the Potential Receptors.

7.4 Characteristics of the Proposed Development

7.4.1 Construction Phase

During the construction stage, the main potential source of contamination to the water environment is the accidental spillage of hydrocarbons, particularly fuel, from construction equipment and vehicles. The other concern would be contamination from the existing waste water treatment system.

In a worst-case scenario, flooding from the stream and the River Blackwater could create a pathway for spilled hydrocarbons or effluent waste to reach the stream, the rivers, and other sensitive areas.

The main receptors are the onsite drinking water supply well and the River Blackwater SAC.

7.4.2 Operational Phase

In the operational stage, the primary concern is the cumulative impact of the two waste water treatment systems, the current and proposed one.

In a worst case scenario flooding from the stream and the River Blackwater has the potential to provide a pathway for the waste water and any potentially spilled hydrocarbons reaching the stream and the rivers.

The main receptors are the onsite drinking water supply well and the River Blackwater SAC.

7.5 Potential Impact of the Proposed Development

A bespoke groundwater sensitivity assessment was conducted for groundwater in the subsoil and bedrock (Table 7-7). The hydrogeological environment according to Table 7-7 indicates that elements of Types A, B, D and E appear to all apply. Such a classification however does not appear to be useful compared with a bespoke assessment of impacts to the environment that the development may cause.

Based on hydrological and/or hydrogeological connectivity of the pathway to the specified receptors the following features are screened in/out. Only features which are categorised as "Screen In" will be focused on as a potential impact in the subsequent sections.

Table 7-7: Groundwater Receptor Sensitivity Assessment

Feature	Sensitive	Screen In/Out	Justification
Groundwater abstraction well onsite	Sensitive	Screen In	The drinking water abstraction well is within 250m east of the proposed location of the proposed hangar, paramedic prefab base and crew prefab base and associated proposed waste water treatment system. Currently the waste water system serving the aeroclub buildings and the HSE Air Ambulance (kitchen and toilet) is within 150m of the well with no impact on the well supply reported. The SSA assessment recommends that the Proposed Development is suitable only with a tertiary waste water treatment

Feature	Sensitive	Screen In/Out	Justification
			system following the results of the surface water and groundwater percolations tests. The top 2m of the soil and subsoil was reported to consist of clay with silt and stone from the test holes which is why tertiary system is recommended but this will significantly retard migration of any hydrocarbon contamination. However, the well is 'screened in' because of the short distance and the potential for variability in the subsoil described broadly as alluvium.

The basis of the Impact Assessment Process is the source-pathway-receptor approach, which is used in this chapter to assess the potential impacts on the water environment of the proposed development. The very nature of water in the surface and subsurface indicates that the precise but generic nature of the source-pathway-receptor approach to characterising the impact is particularly effective.

Where potential impacts are identified, the classification of the impacts follows the description outlined in the 2022 EPA document: *Guidelines on the Information to be contained in Environmental Impact Assessment Reports*.

The impact assessment process is summarised in Table 7-8. The impact assessment process is applied to the construction and operational phases of the development.

Table 7-8: Summary of Assessment Process

Step	Task	Explanation
Step 1	Identify Source	The activity that delivers the potential source of pollution.
Step 2	Pathway/Mechanism	The route along which the potential source can travel to the receptor.
Step 3	Receptor	The feature that is linked to the source via the pathway
Step 4	Pre-mitigation Impact	Determine the impact on the receptor without intervention/no mitigation measures.
Step 5	Identify Mitigation Measures	Identify mitigation measures to prevent or reduce significant impacts on the receptor.
Step 6	Residual Impact	The impact on the receptor is reassessed following the recommendation/installation of mitigation measures.
Step 7	Determine Significant of Effects	Describes the effects on the environment once the mitigation measures are installed and operational.

7.5.1 Construction Phase

The source-pathway-receptors for three different potential sources are described in Table 7-9 to Table 7-10.

Table 7-9: Source-Pathway-Receptor Assessment for Waste Water Treatment System

Step	Task	Explanation
Step 1	Identify Source	Effluent from percolation area.
Step 2	Pathway/Mechanism	Migration through the subsoil to groundwater in subsoil and continued migration to groundwater in bedrock.

Table 7-9: Source-Pathway-Receptor Assessment for Waste Water Treatment System

Step	Task	Explanation
		To the River Blackwater during flood events.
Step 3	Receptor	Onsite drinking water well. River Blackwater SAC.
Step 4	Pre-mitigation Impact	The waste water treatment plant will at least treat effluent to secondary effluent levels which will mean it is unlikely to be an issue due the attenuation of the subsoil. Because of this and the distance between the percolation area and the River Blackwater SAC the impact on this receptor is considered likely but short-medium term and not significant under normal circumstances. Normal circumstances (and not worst case scenario which is dealt with below) include the flooding onsite that may reach the proposed percolation area. Normal circumstances also mean there maybe flooding onsite but that although the flood waters may reach the percolation area, but they will not impact the well, which is at an elevated height relative to the percolation area and has a raised chamber therefore the impact on the well is unlikely. There has not been an impact of the current waste water system on the supply well therefore the risk is considered unlikely. With the distances to nearest drinking water wells so large, the impact will be unlikely and imperceptible and screened out.
Step 5	Identify Mitigation Measures	Installation of wastewater treatment plant and percolation area to specification.
Step 6	Residual Impact	Likely, not significant, neutral, short-medium term impact on River Blackwater. Not significant and neutral impact on onsite drinking water supply well.
Step 7	Determine Significant of Effects	It is considered that the effect on drinking water wells and the River Blackwater SAC is not likely, neutral and imperceptible.

Table 7-10: Source-Pathway-Receptor Assessment for Hydrocarbons Spillage from Runway and Helipad during Refuelling or during Parking Planes in Hangar Area.

Step	Task	Explanation
Step 1	Identify Source	Leaking bowser or helicopter fuel tank. Accidental spillages during refuelling from mobile bowser under normal circumstances.
Step 2	Pathway/Mechanism	Will fall on tarmac runway surface and may not all be collected in hydrocarbon interceptors.
Step 3	Receptor	Onsite drinking water well. River Blackwater SAC.

Table 7-10: Source-Pathway-Receptor Assessment for Hydrocarbons Spillage from Runway and Helipad during Refuelling or during Parking Planes in Hangar Area.

Step	Task	Explanation
Step 4	Pre-mitigation Impact	If spillages are minor, then slight.
Step 5	Identify Mitigation Measures	Fuel spills cleaned up as soon as possible. Fuel spills prevented from flowing off the concrete or tarmac surfaces by building in a lip at the edge and passing runoff through interceptors. Normal circumstances may include flooding that reaches the helipad and therefore effect the collection of spilled hydrocarbon for transmitting via the separators.
Step 6	Residual Impact	Unlikely, negative, not significant, local, medium term effects on onsite drinking water well. Unlikely, neutral, indirect, not significant, local, short to medium term effects on River Blackwater SAC.
Step 7	Determine Significant of Effects	Unlikely, direct, negative, not significant, medium-term effects on drinking water well. Unlikely, neutral, indirect, not significant, local, short to medium term effects on River Blackwater SAC.

7.5.2 Operational Phase

The potential impacts during the operational phase are the same as the described for the construction phase in the previous section.

However, part of the Proposed Development which will have positive impact on the environment is augmentation of the culverts away from and beneath the proposed runway. These augmentations will have the effect of significantly mitigating against the creation of waterlogged conditions on site and will result in stream flow being less restricted and therefore more like how it was pre-culvert installation (the Rathcool flying club was set up in 1963). The ability of the stream to take surface water is important for mitigating against flooding of the runway from the stream but also for mitigating against the River Blackwater flood waters reaching the runway and further south to the helipad, the huts and the hangar. For these reasons the upgrading of the culverts associated with the stream is important for mitigating the impact of the Proposed Development on the environment.

7.5.3 Potential Cumulative Impacts

The potential cumulative impact of the Proposed Development will be a cumulative number of fuel/hydrocarbon spills reaching the onsite well and the River Blackwater. The former is unlikely and not significant because of the use of interceptors, spill kits onsite and the anticipated attenuation effects of the subsoil which is reported to be 12 m thick at the well onsite. The impact on the latter (River Blackwater SAC) is possible if runoff from the helipad enters the drainage system, via overland flow and shallow groundwater in the subsoil. The use of hydrocarbon separators and the absence of topographic gradient from the helipad to the drains are considered mitigation factors in this regard. However, there is a topographic gradient from the proposed runway to the stream drain running through the site but the retention by the separators plus the vegetation in the stream drain mean the cumulative

impacts on the River Blackwater are considered negative, not significant, with effects that are short to medium term.

There is also the possibility of a spillage on the roadway to the south of the site entering the drainage onsite. This will add to the cumulative effects of onsite activities. The cumulative impacts on the River Blackwater are still considered negative, not significant with effects that are short to medium term.

There are no other such facilities in the area. The two nearest (road vehicle) fuel stations are 3 m and 5.5 km from the site.

7.5.4 “Do Nothing” Impact

The EPA Guidance defines the ‘Do Nothing Effects’ as “The environment as it would be in the future should the subject project not be carried out” (EPA 2022).

The ‘Do Nothing Scenario’ will see the aerodrome still be used for the landing and take-off of helicopters for the HSE Air Ambulance Service however this can only happen during clear daylight hours because of the lack of a tarmac runway and associated lights. Airplanes in use for the flying club will also be using the runway.

A more upgraded facility, featuring upgraded culverts, a tarmac runway with lighting, and hydrocarbon interceptors for the helipad, may result in a reduced environmental impact compared to current conditions, as the site is already in use by helicopters from the HSE Air Ambulance Service.

There is one Source-Pathway-Receptor (SPR) where the resulting effect will be more negative (in a do nothing scenario): the existing runway is grass covered therefore at the moment there is a more direct pathway from any leaking fuel/oil tank to groundwater in the subsoil.

In addition, the upgrade of the culverts will mean ponding of surface water onsite will be reduced therefore reducing the risk of direct contact of potential fuel spills with the water environment.

7.6 Avoidance, Remedial and Mitigation Measures

7.6.1 Construction Phase

During construction, silt fencing will be installed to control surface runoff and prevent sediment from entering nearby water bodies. Contractors will adhere to Met Éireann weather warnings, particularly in the case of heavy rainfall or potential flooding, to minimize the risk of water pollution. In response to such forecasts, all equipment will be relocated outside of flood-prone areas. Additionally, comprehensive spill prevention and response plans will be implemented to manage any accidental releases effectively.

7.6.2 Operational Phase

Any runoff from the proposed runway is discharged to vegetation adjacent to the stream rather than directly into the stream because the vegetation will aid on the attenuation of any hydrocarbons spilled.

The car park between the huts and the hangar (see Appendix 6.2) will have a concrete surface.

The helipad and runway will be constructed with a lip to collect runoff and the runoff will flow through interceptors.

Mobile bowser will be kept on a concrete surface at all times with a lip for collecting runoff when spills occur for the interceptors.

7.6.3 “Worst Case” Scenario

There are two worst case scenarios worth considering for the site: flooding of the River Blackwater as per the NIFM 1 in 100 year indicative present-day and future fluvial flood scenarios represented in Figure 6 and Figure 7 of the FRA (Appendix 7.1). Such potential events have the potential to impact the waste water treatment system therefore providing a potential pathway to the onsite drinking water well and the River Blackwater. The flood waters will potentially also provide a pathway for any hydrocarbons spilled to reach to the onsite well and the River Blackwater. The effects on the River Blackwater are considered negative, likely, not significant and short to medium-term; while those on the well are considered unlikely, significant and long-term. The clay towards the top of the subsoil along with the well casing may provide sufficient protection to the well. In addition, the well has a chamber that is at least 50cm above ground surface.

The mitigation measure of enhancing the culverts has potential to much reduce the likelihood of flood water associated with the stream and the River Blackwater from reaching the proposed waste water treatment system, the helipad, the huts and the hangar.

The second worst case scenario would be an impact on the onsite supply well from a hydrocarbon spill because the mitigation measure of the hydrocarbon interceptor fails or is bypassed. A crash landing of the air ambulance is a potential cause of the hydrocarbon interceptor being bypassed especially if the crash ends up going off the runway or helipad. The only mitigation in the event the hydrocarbon separators are bypassed is the attenuation potential of the subsoil. This impact is considered negative, not likely and not significant because of the attenuation effects of the underlying alluvium and till.

7.7 Residual Impacts

There are two main potential sources of contamination related impact on the environment which are cumulative impact of the two waste water treatment systems, the current and proposed one, and the accidental spillage of hydrocarbons, particularly fuel.

In a worst case scenario flooding from the stream and the River Blackwater has the potential to provide a pathway for the waste water and any potentially spilled hydrocarbons reaching the stream and the rivers.

The main receptors are the onsite drinking water supply well and the River Blackwater SAC.

The residual impacts on the latter are considered unlikely, neutral, indirect, not significant, local, short to medium term effects on River Blackwater SAC while the residual impacts on the former are considered unlikely, negative, not significant, local, medium term effects on onsite drinking water well.

Part of the Proposed Development which will have positive impact on the environment is augmentation of the culverts away from and beneath the proposed runway. These augmentations will have the effect of significantly mitigating against the creation of waterlogged conditions on site and will result in stream flow being less restricted and therefore more like how it was pre-culvert installation (the Rathcool Flying Club was set up in 1963). The ability of the stream to take surface water is important for mitigating against flooding of the runway from the stream but also for mitigating against the River Blackwater flood waters reaching the runway and further south to the helipad, the huts and the hangar. For these reasons the upgrading of the culverts associated with the stream is important for mitigating the impact of the Proposed Development on the environment.

7.8 Monitoring

7.8.1 Construction Phase

Ongoing monitoring of water quality (visual inspection to examine for oil sheen, excess suspended solids or discoloration and turbidity; plus in situ measurement to include pH, temperature, electrical conductivity, turbidity, suspended solids) in land drain and stream adjacent to construction activity will be essential to identify and mitigate any adverse impacts during this phase of works.

7.8.2 Operational Phase

Ongoing monitoring should include a monthly visual inspection of drains to examine for oil sheen, excess suspended solids or discoloration and turbidity to ensure no hydrocarbons or excess sediment will be essential to identify and mitigate any adverse impacts during operations.

7.9 Interactions

The following chapters have interactions with the water environment:

- Biodiversity Chapter: proximity the River Blackwater SAC - changes in water quality or flow in this sensitive waterbody could affect aquatic ecosystems.
- Land and Soils: construction activities – e.g. installation of the hard surface runway and culverts, may interact with soil erosion and sediment runoff.
- Population and Human Health: human health/drinking water – groundwater contamination from hydrocarbons or wastewater systems during flood events.

7.10 Difficulties Encountered When Compiling

The compilation process proceeded without significant challenges, allowing for efficient integration of data and collaboration across all involved parties.

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8 AIR QUALITY

8.1 Introduction

This chapter describes and assesses the potential effects on air quality associated with the Proposed Development.

8.1.1 Quality Assurance and Competence

This chapter was prepared by Laura Griffin, Environmental Consultant at Enviroguide (now DNV). Laura has a Master of Science (Hons) degree in Climate Change from Maynooth University and a Bachelor of Arts (Hons) degree in English and Geography from Maynooth University. Laura has 5+ years of professional experience. Laura has experience preparing Environmental Impact Assessment (EIA) Screening Reports and a EIAR chapters for developments of a similar scale and nature to the Proposed Development.

This chapter was reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at Enviroguide (now DNV). Catherine is an environmental consultant with 20 years' experience in consultancy, specialising in EIAs for a wide range of infrastructure developments.

8.2 Study Methodology

This study methodology is in line with accepted practices. Taking into account Ambient Air Quality Standards, the baseline air quality of the site is examined using EPA monitoring data. Air quality effects from the Proposed Development are then determined by a qualitative assessment of the nature and scale of dust and emission generating activities associated with the construction phase of the Proposed Development in accordance with relevant guidance (Institute of Air Quality Management (IAQM) 2024).

In addition to assessing the effect on people as a result of air quality, the effect on sensitive ecosystems must also be assessed as per the TII guidelines (TII, 2022; 2024). The EC Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (the '*Habitats Directive*') requires an Appropriate Assessment to be carried out where there is likely to be a significant effect upon a European protected site. TII requires the Air Quality Specialist to liaise with an ecologist on schemes where there is a European protected site within 2km of the site. The following internationally designated sites are within 2km of the Proposed Development:

- Blackwater River (Cork/Waterford) Special Area of Conservation (SAC).

This study involved coordination with the ecologist preparing the Biodiversity Chapter and Natura Impact Statement (NIS) and should be read in conjunction with Chapter 5 Biodiversity and the Appropriate Assessment (AA) Screening/NIS, and should be read in conjunction with the Population and Human Health, Land and Soils, Biodiversity, Climate and Traffic Chapters of this EIAR, as well as the Appropriate Assessment Screening/NIS, where potential impacts to the nearest Natura 2000 sites are further assessed.

8.2.1 Relevant Legislation and Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on air quality is as follows:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government (DHPLG), 2018);
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017);
- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (hereafter referred to as the Environmental Protection Agency (EPA) Guidelines) (EPA, 2022);
- Guidance on the Assessment of Dust from Demolition and Construction Version 2.2 (Institute of Air Quality Management (IAQM), 2024);
- A Guide To The Assessment Of Air Quality Impacts On Designated Nature Conservation Sites (Version 1.1) (IAQM, 2020);
- TII Guidance Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 and TII Road Emissions Model (REM) online calculator tool (TII, 2022); and
- TII Road Emissions Model (REM): Model Development Report – GE-ENV-01107 (TII, 2024).

8.2.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland (DEHLG, 2004) and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants. These limit values or '*Air Quality Standards*' are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed based on compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2022, which incorporate European Commission Directive 2008/50/EC, which has set limit values for numerous pollutants with the limit values for NO₂, PM₁₀, and PM_{2.5} being relevant to this assessment. Directive 2008/50/EC also sets ambient air quality limit values for other pollutants including sulphur dioxide (SO₂), carbon monoxide (CO), and benzene. While these pollutants are not considered significant in the context of this residential development, where traffic-related emissions such as NO₂ and PM are more relevant, they are acknowledged for completeness and regulatory requirement.

Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and includes ambient limit values relating to PM_{2.5}. In addition, Ireland is a signatory to the Gothenburg Protocol under the United Economic Commission for Europe (UNECE) Convention on Long-Range Transboundary Air Pollution (LRTAP). The Protocol sets national emission reduction commitments for key pollutants including SO₂, nitrogen oxides (NO_x),

volatile organic compounds (VOCs), ammonia (NH₃) and PM_{2.5}. While it does not establish ambient air quality standards, it supports national and EU-level efforts to reduce transboundary air pollution and informs Ireland's air quality and emissions policy framework.

These pollutants are not considered further in this chapter, as they are not expected to be significantly influenced by the Proposed Development.

The applicable limit values for NO₂, PM₁₀, and PM_{2.5}, SO₂, CO and benzene are set out in Table 8-1.

Table 8-1 Ambient Air Quality Standards and TA Luft

Pollutant	Regulation ¹	Limit Type	Value
Dust Deposition	TA Luft (German VDI, 2002)	Annual average limit for nuisance dust	350 mg/m ² /day
Nitrogen Dioxide	2008/50/EC	Annual average limit for nuisance dust	200 µg/m ³
		Annual limit for protection of human health	40 µg/m ³
NO _x	2008/50/EC	Annual limit for the protection of vegetation	30 µg/m ³

¹ EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

Pollutant	Regulation ¹	Limit Type	Value
Particulate Matter (as PM ₁₀)	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³ PM ₁₀
		Annual limit for protection of human health	40 µg/m ³ PM ₁₀
Particulate Matter (as PM _{2.5}) – Stage 1	2008/50/EC	Annual limit for protection of human health	25 µg/m ³ PM _{2.5}
Particulate Matter (as PM _{2.5}) – Stage 2 ²	2008/50/EC	Annual limit for protection of human health	20 µg/m ³ PM _{2.5}
Sulphur Dioxide (SO ₂)	2008/50/EC	Hourly limit for the protection of human health (not to be exceeded >24 times/year)	350 µg/m ³
		Daily limit for protection of human health (not to be exceeded >3 times/year)	125 µg/m ³
Carbon Monoxide (CO)	2008/50/EC	Maximum daily 8-hour mean	10 mg/m ³
Benzene	2008/50/EC	Annual limit for protection of human health	5 µg/m ³

On the 14th of October 2024 the European Parliament and the Council adopted a directive setting updated air quality standards across the EU. The directive aims to improve air quality across the EU by aligning standards with the latest World Health Organisation (WHO) guidelines and reducing air pollution's health impacts by more than 55% by 2030. The directive updates and consolidates previous directives (2004/107/EC and 2008/50/EC) to enhance clarity and effectiveness. This plan is part of the broader European Green Deal and the Zero Pollution Action Plan, targeting significant reductions in air, water, and soil pollution by 2050. The revised directive will also ensure early action, with air quality roadmaps that need to be prepared ahead of 2030 if there is a risk that the new standards will not be attained by that date. The air quality standards will be reviewed regularly in line with latest scientific evidence to assess whether they continue to be appropriate.

Directive (EU) 2024/2881 was published in the EU's Official Journal and entered into force on the 10th of December 2024. Member States have until 10th of December 2026 to transpose the directive into national law. Ireland is required to meet this deadline; however, at the time of writing, a national transposition date has not yet been confirmed.

² Stage 2 Indicative limit value for PM_{2.5} to be applied from 1 January 2020 after review by the European Commission

By 2030, the European Commission will review the air quality standards and every five years thereafter, in line with latest scientific evidence.

At present, the applicable standards for assessing compliance in relation to air quality are those outlined in Table 8-1.

8.2.2 Construction Phase

8.2.2.1 Construction Dust Impact Assessment

The main air quality impacts that may arise during demolition and construction activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM₁₀, PM_{2.5} concentrations from demolition and construction activities (including earthworks and trackout); and
- An increase in concentrations of PM₁₀, PM_{2.5} and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

The risk of dust emissions from a demolition/construction site causing loss of amenity and/or health or ecological impacts (and effects) is related to:

- The activities being undertaken (demolition, number of vehicles and plant etc.);
- The duration of these activities; the size of the site;
- The meteorological conditions (wind speed, direction and rainfall);
- The proximity of receptors to the activities;
- The adequacy of the mitigation measures applied to reduce or eliminate dust; and
- The sensitivity of the receptors to dust.

The IAQM *Guidance on the Assessment of Dust from Demolition and Construction* (2024) provides a framework for the assessment of risk.

Activities on construction sites have been divided into four types:

- Demolition;
- Earthworks;
- Construction; and
- Trackout.

The potential for dust emissions is assessed for each activity that is likely to take place.

The assessment methodology considers three separate dust impacts:

- Annoyance due to dust soiling;
- The risk of health impacts due to an increase in exposure to PM₁₀; and
- Harm to ecological receptors with account being taken of the sensitivity of the area that may experience these effects.

The assessment is used to define appropriate mitigation measures to ensure that there will be no significant effects.

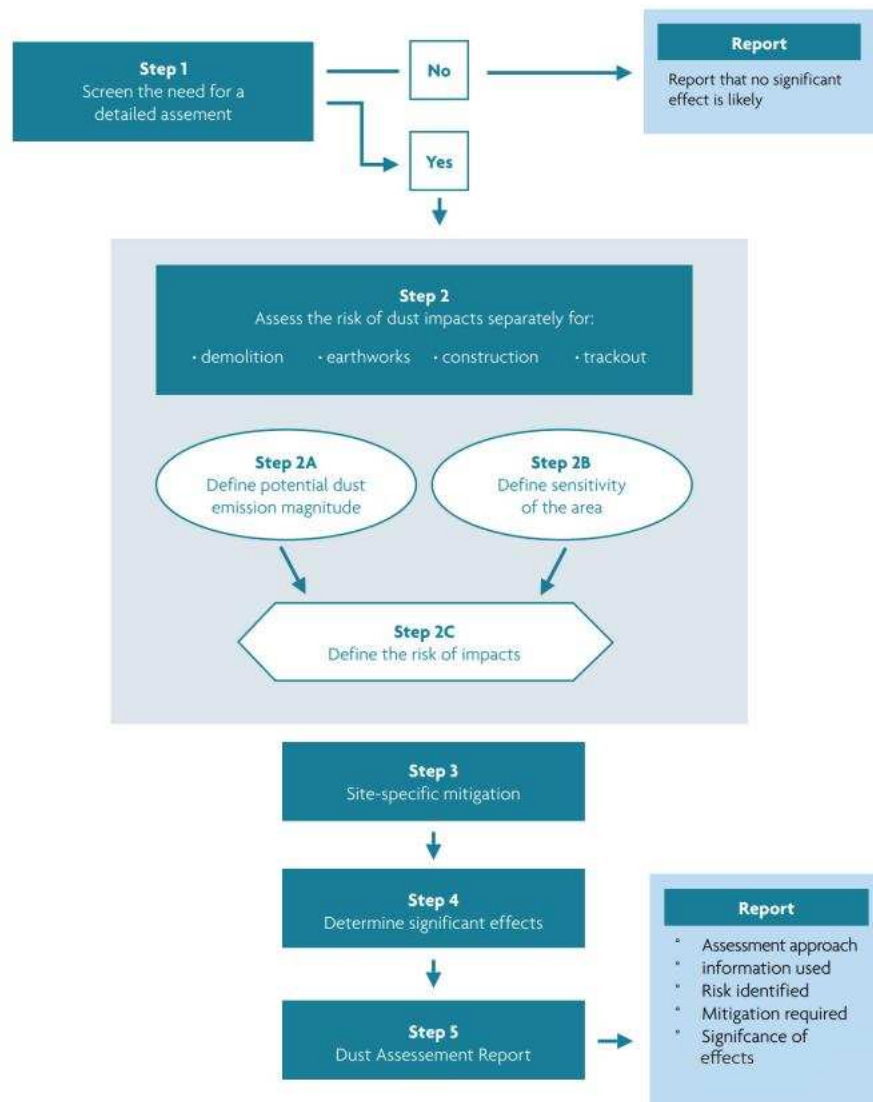


Figure 8-1 Steps to Perform a Dust Assessment (IAQM, 2024)

Step 1 - Screening the Need for a Detailed Assessment

Step 1 is to screen the requirement for a more detailed assessment. An assessment will normally be required where there is:

- A human receptor within:
 - 250m of the boundary of the site; and/or
 - 50m of the route(s) used by the construction vehicles on the public highway, up to 250m from the site entrance(s).
- An 'ecological receptor' within:
 - 50m of the boundary of the site; and/or
 - 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the site entrance(s).

There are no human receptors within 250m of the boundary of the site, however, there are between 10 and 100 human receptors within 50m of route(s) used by construction vehicles. Blackwater River (Cork/Waterford) Special Area of Conservation (SAC) is located directly north of the site.

Step 2 - Assess the Risk of Dust Impacts

Step 2 is to assess the risk of dust impacts. This is carried out separately for each of the four activities (demolition; earthworks; construction; and trackout). According to the IAQM (2024), the risk of dust arising in sufficient quantities to cause annoyance and/or ecological impacts should be determined using four risk categories: negligible, low, medium and high. A site is allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the potential dust emission magnitude as small, medium and large (Step 2A); and
- The sensitivity of the area to dust impacts (Step 2B), which is defined as low, medium or high sensitivity.

These two factors are combined in Step 2C to determine the risk of dust impacts with no mitigation applied. The risk category assigned to the site can be different for each of the four potential activities (demolition, earthworks, construction and trackout). More than one of these activities may occur on a site at any one time. Risks are described in terms of there being a low, medium and high risk of dust impacts for each of the four separate potential activities. Where there are low, medium and high risks of an impact, then site-specific mitigation will be required, proportionate to the level of risk.

Step 2A – Define the Potential Dust Emission Magnitude

The dust emission magnitude is based on the scale of the anticipated works and should be classified as Small, Medium or Large.

Demolition: Definitions for demolition as follows:

- Large: Total building volume $>75,000\text{m}^3$, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities $>12\text{m}$ above ground level;
- Medium: Total building volume $12,000\text{m}^3 - 75,000\text{m}^3$, potentially dusty construction material, demolition activities $6-12\text{m}$ above ground level; and
- Small: Total building volume $12,000\text{m}^3$, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities $<6\text{m}$ above ground, demolition during wetter months.

The total volume of building to be demolished is $147,224\text{m}^3$ and therefore, the dust emission magnitude for demolition is defined as large.

Earthworks: Earthworks will primarily involve excavating material, haulage, topping and stockpiling. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium and large based on the definitions from the IAQM guidance:

- Large: Total site area $>110,000\text{m}^2$, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds $>6\text{m}$ in height;
- Medium: Total site area $18,000\text{m}^2 - 110,000\text{m}^2$, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds $3\text{m} - 6\text{m}$ in height; and
- Small: Total site area $<18,000\text{m}^2$, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds $>3\text{m}$ in height.

The dust emission magnitude for the proposed earthwork activities can be classified as large as a worst-case scenario, as the total site area is 20.69 hectares.

Construction: The key issues when determining the potential dust emission magnitude during the construction phase include the size of the building(s)/infrastructure, method of construction, construction materials, and duration of build. The IAQM example definitions for construction are:

- Large: Total building volume $>75,000\text{ m}^3$, on site concrete batching, sandblasting;
- Medium: Total building volume $12,000\text{ m}^3 - 75,000\text{ m}^3$, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- Small: Total building volume $<12,000\text{ m}^3$, construction material with low potential for dust release (e.g. metal cladding or timber).

The total volume of building to be constructed is $198,168\text{ m}^3$. Due to the size of the Proposed Development, as well as the fact that potentially dusty construction material (e.g. concrete) will be used, the dust emission magnitude for the proposed construction activities can be classified as large.

Trackout: Factors which determine the dust emission magnitude are vehicle size, vehicle speed, vehicle numbers, geology and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the dust emission magnitude categories. IAQM definitions for trackout are:

- Large: >50 HDV ($>3.5\text{t}$) outward movements³ in any one day⁴, potentially dusty surface material (e.g. high clay content), unpaved road length $>100\text{m}$;
- Medium: 20-50 HDV ($>3.5\text{t}$) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length $50\text{m} - 100\text{m}$; and
- Small: <20 HDV (3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length $<50\text{m}$.

These numbers are for vehicles that leave the site after moving over unpaved ground, where they will accumulate mud and dirt that can be tracked out onto the public highway.

³ A vehicle movement is a one-way journey i.e., from A to B, and excludes the return journey.

⁴ HDV movements during the construction project vary over its lifetime, and the number of movements is the maximum, not the average.

The dust emission magnitude for the proposed trackout activities can be classified as medium as a worst-case scenario.

Table 8-2 provides a summary of the dust emission magnitude for the site.

Table 8-2 Dust Emission Magnitude for the site

Activity	Dust Emission Magnitude
Demolition	Large
Earthworks	Large
Construction	Medium
Trackout	Medium

Step 2B – Define the Sensitivity of the Area

The sensitivity of the area takes account of a number of factors:

- The specific sensitivities of receptors in the area;
- The proximity and number of those receptors;
- In the case of PM₁₀, the local background concentration; and
- Site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of wind-blown dust.

Sensitivities of People to Dust Soiling Effects

For the sensitivity of people and their property to soiling, the IAQM (2024) recommends that the air quality practitioner uses professional judgment to identify where on the spectrum between high and low the sensitivity of a receptor lies, taking into account the following general principles set out in Table 8-3.

Table 8-3 Sensitivities of People to Dust Soiling Effects (Source: IAQM, 2024)

Sensitivity	Features	Indicative Examples
High	• Users can reasonably expect enjoyment of a high level of amenity; or • The appearance, aesthetics or value of their property would be diminished by soiling; and • The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of the use of the land.	• Dwellings; • Museums and other culturally important collections; and • Medium and long term car parks and show rooms.
Medium	• Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or	• Parks; and • Places of work.

Sensitivity	Features	Indicative Examples
	- The appearance, aesthetics or value of their property could be diminished by soiling; or - The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land.	
Low	- The enjoyment of amenity would not reasonably be expected; or - Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling; or - There is a transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use for the land.	- Playing fields; - Farmland (unless commercially sensitive horticultural); - Footpaths; - Short-term car parks⁵ - Places of work.

Sensitivities of People to Health Effects of PM₁₀

For the sensitivity of people to the health effects of PM₁₀, the IAQM (2024) recommends that the air quality practitioner assumes that there are three sensitivities based on whether or not the receptor is likely to be exposed to elevated concentrations over a 24-hour period, consistent with the Defra's advice for local air quality management, Defra LAQM Technical Guidance LAQM.TG (2022).

Table 8-4 Sensitivities of People to the Health Effects of PM₁₀ (Source: IAQM, 2024)

Sensitivity	Features	Indicative Examples
High	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM₁₀ (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day)⁶.	- Residential properties; - Hospitals; - Schools; and - Residential care homes.

⁵ Car parks have a range of sensitivities depending on the duration and frequency that people would be expected to park their cars there, and the level of amenity they could reasonably expect whilst doing so. Car parks associated with workplace or residential parking might have a high level of sensitivity compared to car parks used less frequently and for shorter durations, such as those associated with shopping. Cases should be examined on their own merits.

⁶ This follows Defra guidance as set out in LAQM.TG (2022)

Sensitivity	Features	Indicative Examples
Medium	Locations where the people exposed are workers⁷, and exposure is over a time period relevant to the air quality objective for PM₁₀ (in the case of 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day).	Office and shop owners. (Workers occupationally exposed to PM₁₀ are generally not included as protection is covered by Health and Safety at Work Legislation)
Low	Locations where human exposure is transient⁸.	- Public footpaths; - Playing fields; and - Shopping streets.

Sensitivities of Receptors to Ecological Effects

Dust deposition due to demolition, earthworks, construction and trackout has the potential to affect sensitive habitats and plant communities.

Dust can have two types of effect on vegetation: physical and chemical. Direct physical effects include reduced photosynthesis, respiration and transpiration through smothering. Chemical changes to soils or watercourses may lead to a loss of plants or animals for example via changes in acidity. Indirect effects can include increased susceptibility to stresses such as pathogens and air pollution. These changes are likely to occur only as a result of long-term demolition and construction works adjacent to a sensitive habitat.

An AA Screening and NIS have been prepared for the Proposed Development. These assessments concluded that, with the implementation of standard mitigation measures, the Proposed Development will not result in significant adverse effects on the integrity of the designated sites.

Accordingly, any dust-related ecological impacts are expected to be temporary and reversible once construction activities cease.

Table 8-5 provides an example of possible sensitivities:

⁷ Notwithstanding the fact that the air quality objectives and limit values do not apply to people in the workplace, such people can be affected by the exposure of PM₁₀. However, they are considered to be less sensitive than the general public as a whole because those most sensitive to the effects of air pollution, such as young children are not normally workers. For this reason workers have been included in the medium sensitivity category.

⁸ There are no standards that apply to short-term exposure, e.g. one or two hours, but there is still a risk of health impacts, albeit less certain.

Table 8-5 Sensitivities of Receptors to Ecological Effects

Sensitivity	Features	Indicative Examples
High	- Locations with an international designation and the designated features may be affected by dust soiling; or - Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Ireland.⁹	A Special Area of Conservation (SAC) designated for acid heathlands, or a local site designated for lichens adjacent to the demolition of a large site containing (alkali) buildings).
Medium	- Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or - Locations with a national designation where the features may be affected by dust deposition.	A Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	Locations with a local designation where the features may be affected by dust deposition.	A local Nature Reserve with dust sensitive features.

Table 8-6 – Table 8-8 illustrate how the sensitivity of the area may be determined for dust soiling, human health impacts and ecological impacts, respectively. It should be noted that the highest level of sensitivity from each table should be considered, as recommended by the IAQM.

The criteria detailed in Table 8-6 - 8-8 were used to determine the sensitivity of the area to dust soiling effects, human health impacts and ecological impacts.

Table 8-6 Sensitivity of Dust Soiling Effects on People and Property

Receiver Sensitivity	Number of Receivers	Distance from the Source (m)			
		<20m	<50m	<100m	<250m
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

⁹ A Habitat Regulation Assessment of the site may be required as part of the planning process, if the site lies close to an internationally designated site i.e., Special Conservation Areas (SACs), Special Protection Areas (SPAs) designated under the Habitats Directive (92/43/EEC) and RAMSAR sites.

Table 8-7: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ concentration	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32 µg/m ³	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m ³	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m ³	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m ³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m ³	>100	High	Medium	Low	Low
		10-100	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m ³	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m ³	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m ³	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table 8-8 Sensitivity of the Area to Ecological Impacts

Receptor Sensitivity	Distance from the Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Step 2C – Define the Risk of Impacts

In accordance with the IAQM Guidance, the dust emission magnitude (Step 2A) and sensitivity of the area (Step 2B) have been combined and the risk of impacts from demolition, construction, earthworks and trackout have determined (before mitigation is applied).

Table 8-9 to 8-12 illustrate how the dust emission magnitude should be combined with the sensitivity of the area to determine the risk with no mitigation measures applied.

Table 8-9 Risk of Dust - Demolition

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
Low	Medium Risk	Low Risk	Negligible

Table 8-10 Risk of Dust – Earthworks

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 8-11 Risk of Dust – Construction

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 8-12 Risk of Dust – Trackout

Potential Impact	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

The risk of dust impacts is based on the potential dust emissions magnitude and the sensitivity of the area. These two factors are then combined to determine the risk of dust impacts with no mitigation applied. For the Proposed Development, site-specific information has been used to inform the assessment, allowing for a more accurate determination of risk.

The risk of dust soiling and the impact on human health and risk of ecological impacts before mitigation, is summarised in Section 8.5.1.

8.2.2.2 Construction Phase Traffic Emissions

Construction phase traffic has the potential to affect air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022), states that road links meeting one or more of the following criteria can be defined as being ‘affected’ by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 km/h or more;
- Peak hour speed change by 20 km/h or more; or
- A change in road alignment by 5m or greater.

The construction stage traffic will not change by more than 1,000 AADT or 200 HDV AADT and does not meet the above scoping criteria. In addition, there are no proposed changes to the traffic speeds or road alignment. As a result, in accordance with TII guidance, a detailed air assessment of construction stage traffic emissions has been scoped out. This is considered a proportionate and appropriate approach, and no further assessment or precautionary measures are required.

8.2.3 Operational Phase

8.2.3.1 Operational Phase Traffic Emissions

Operational phase traffic has the potential to affect local air quality as a result of increased vehicle movements associated with the Proposed Development. The TII scoping criteria detailed in Section 8.2.2.2 were used to determine if any road links are affected by the Proposed Development and require inclusion in a detailed air quality modelling assessment.

The estimated vehicle trips that will be generated by the Proposed Development has been estimated by Waterman Consulting Engineers. The TII scoping criteria detailed in Section 8.2.2.2 have not been met by the Proposed Development, it is projected that the increase in road traffic volumes associated with the Proposed Development will be minimal during the operational phase (an increase of 4 vehicles per day). Therefore, a detailed air quality modelling assessment of operational phase traffic emissions has been scoped out.

8.2.3.2 Operational Phase Air Traffic Emissions

Aircraft operations during the operational phase of the Proposed Development are expected to contribute to local air pollutant concentrations through emissions generated during taxiing, take-off, landing. These emissions primarily consist of nitrogen oxides (NO_x), particulate matter (PM₁₀ and PM_{2.5}), carbon monoxide (CO), and volatile organic compounds (VOCs). The assessment of these emissions is critical to understanding the potential impact on ambient air quality in the surrounding area.

To quantify and evaluate these impacts, a detailed air dispersion modelling study was undertaken.

8.2.3.2.1 Air Dispersion Modelling Methodology

An Air Emissions Assessment was prepared by DNV (2025). An air dispersion model was undertaken to assess the potential air quality impacts associated with aircraft emissions from the Proposed Development. Dispersion modelling provides a mathematical approximation of atmospheric dispersion processes to estimate ambient pollutant concentrations at specified receptor locations (EPA, 2020). The modelling was conducted using the U.S. EPA-approved AERMOD software (version 13.0) in accordance with the Environmental Protection Agency's Air Dispersion Modelling from Industrial Installations Guidance Note (AG4, 2020).

The methodology comprised the following key steps:

- **Emission Source Characterisation:** Aircraft-related emission sources were identified and quantified based on operational data for Rathcool Aerodrome and standard emission factors. Emissions were primarily associated with the landing and take-off (LTO) cycle, including taxiing, idling, take-off, climb-out, approach, and landing;

- **Model Configuration:** The AERMOD model was configured using the site layout, emission parameters, and receptor locations to ensure accurate representation of the proposed development and surrounding environment;
- **Meteorological Data Processing:** Five years of hourly meteorological data from the nearest representative synoptic station were processed using AERMET to provide input for the dispersion model;
- **Terrain and Building Effects:** Terrain and building downwash effects were incorporated using AERMAP, ensuring that local topography and structures were accounted for in the dispersion calculations;
- **Model Execution:** The model predicted ground-level concentrations (GLCs) of pollutants at and beyond the site boundary for each hour of the meteorological record;
- **Post-Processing and Assessment:**
 - Modelled concentrations were compared against the relevant ambient air quality standards set out in the Air Quality Standards Regulations 2022 (S.I. No. 739 of 2022), which transpose Directive 2008/50/EC into Irish law; and
- **Reporting:** A comprehensive Air Emissions Assessment Report has been prepared (DNV, 2025) and is included in Appendix 8-1.

8.2.3.2.1.1 Pollutants Modelled

The assessment focused on nitrogen oxides (NO_x and NO₂) sulphur dioxide SO₂, and particulate matter (PM₁₀ and PM_{2.5}). These pollutants were selected based on:

- Their relevance to the aircraft types and operational profile at Rathcool Aerodrome (light fixed-wing aircraft and HSE air ambulance helicopters);
- Their regulatory significance under Irish and EU legislation for human and ecological health; and
- Their potential to impact sensitive receptors in the surrounding rural environment.

Other pollutants such as carbon monoxide (CO), benzene, and volatile organic compounds (VOCs) were not included, as emissions from Jet-A/diesel-fuelled engines (e.g., Continental CD-155) are minimal for these pollutants. This approach aligns with FAA Air Quality Handbook, ACRP Report 179, and ICAO guidance, which identify NO_x, PM, and SO₂ as the primary pollutants of concern for turbine and diesel aircraft. Lead was excluded as Jet-A fuel contains no lead. CO emissions from Jet-A engines are significantly lower than those from Avgas engines and have limited spatial impact in open-air environments. VOC and benzene emissions are primarily associated with evaporative losses during fuel storage and are beyond the scope of local dispersion modelling.

8.3 The Existing and Receiving Environment (Baseline Situation)

The site is bounded to the north by agricultural lands and the River Blackwater, to the south and east by local access roads and a wooded area and to the west by agricultural lands.

8.3.1 Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is “*Air Quality In Ireland 2023*” (EPA, 2024). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2025).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC), four air quality zones have been defined in Ireland by the EPA for air quality management and assessment purposes.

The main areas defined in each zone are:

- ❖ **Zone A:** Dublin Conurbation
- ❖ **Zone B:** Cork Conurbation
- ❖ **Zone C:** Other cities and large towns comprising Limerick, Galway, Waterford, Drogheda, Dundalk, Bray, Navan, Ennis, Tralee, Kilkenny, Carlow, Naas, Sligo, Newbridge, Mullingar, Wexford, Letterkenny, Athlone, Celbridge, Clonmel, Balbriggan, Greystones, Leixlip and Portlaoise.
- ❖ **Zone D:** Rural Ireland, i.e., the remainder of the State excluding Zones A, B and C.

The proposed site falls into 'Zone B' of Ireland which is described by the EPA as 'Cork Conurbation'. It is expected that existing ambient air quality in the vicinity of the site is characteristic of a suburban location with the primary source of air emissions such as particulate matter, NO₂, and hydrocarbons likely to be of traffic, combustion and agriculture, and domestic fuel burning.

The EPA launched a national air quality forecast in November 2023, to provide greater information to the public regarding expected air quality in Ireland for up to three days - "Today", "Tomorrow" and the "Day after Tomorrow".

Forecasts include daily Air Quality Index for Health (AQIH), Particulate Matter (PM), nitrogen dioxide (NO₂) and ozone (O₃). PM, NO₂ and O₃ are the three main air pollutants impacting human health in Ireland. All pollutants mapped are presented on the Air Quality Index for Health (AQIH) scale (1 – 10). The forecast maps are uploaded twice daily, once in the morning and once in the evening.

In conjunction with individual local authorities, the EPA undertakes ambient air quality monitoring at specific locations throughout the country in the urban and rural environment; an Air Quality Report based on data from monitoring stations and a number of mobile air quality units is developed on an annual basis. The EPA's most recent publication 'Air Quality in Ireland, 2023' reports the quality of the air in Ireland based on the data from the National Ambient Air Quality Monitoring Network throughout the year 2023 (EPA, 2024).

When assessing air quality, the EPA focuses on two main pollutants: particulate matter and nitrogen oxides. Measured concentrations of NO₂ for the years 2022 and 2023 are presented in Table 8-14 for Zone B monitoring stations.

Table 8-13 Concentrations of NO₂ at Zone B Monitoring Stations

Station	Objective	Concentration (µg/m ³)		Limit or Threshold Value
		2022	2023	
South Link Road	Annual Mean NO ₂ ¹⁰	17.9	15.0	40 µg/m ³
	Days >200µg/m ³	0	0	35 days
UCC Distillery Fields	Annual Mean NO ₂	9.0	7.6	40 µg/m ³
	Days >200µg/m ³	0	0	35 days
Cork Mallow	Annual Mean NO ₂	15.8	13.3	40 µg/m ³
	Days >200µg/m ³	0	0	35 days
Cork Glanmire Rd	Annual Mean NO ₂	32.1	23.0	40 µg/m ³
	Days >200µg/m ³	0	0	35 days

Based on the data summarised in Table 8-14, existing baseline air quality for the area in which the site is located be characterised as being of good quality with no exceedances of the Air Quality Regulations limit values of specific pollutants. The results show that current levels of NO₂ are well below the annual mean and 1-hour maximum limit values. In the year 2022, annual mean concentrations of NO₂ ranged from 17.9 – 32.1 µg/m³ across all Zone B stations, with no exceedance of the maximum hourly limit (EPA, 2023). In the year 2023, annual mean concentrations of NO₂ ranged from 7.6 – 23.0 µg/m³ across all Zone B stations, with no exceedance of the maximum hourly limit (EPA, 2024).

The closest representative background monitoring to the site which continuously monitors for concentrations of nitrogen oxides (NO₂) is located in Mallow (ca. 23km east of the site). Air quality monitoring carried out at this location is likely to be broadly representative of conditions that may be experienced at the site. Concentrations of NO₂ are also well below the threshold limits contained within the regulations at Cork Mallow monitoring station, with an annual mean of 15.8 µg/m³ and 13.3 µg/m³ measured in 2022 and 2023, respectively (EPA, 2022; EPA, 2023).

EPA 2023 background concentrations for Cork Mallow have been used in combination with correction factors to estimate current annual average NO₂ concentrations in the region of the Proposed Development. These factors have been adapted from both TII (2011) and the UK Department of Food and Rural Affairs (DEFRA) roadside NO₂ projection factors. While developed for UK conditions, in DEFRA's projection factors are commonly used in Irish assessment where localised projection tools are not available. Based on these correction

¹⁰ NO₂ annual mean limit value for the protection of human health: 40 µg/m³ per station

factors, the estimated baseline year background NO₂ concentration in the region of the Proposed Development is 14.2 µg/m³.

Measured concentrations of PM₁₀ for the years 2022 and 2023 are presented in Table 8-15 for Zone B monitoring stations.

Table 8-14 Concentrations of PM₁₀ at Zone B Monitoring Stations

Station	Objective	Concentration (µg/m ³)		Limit or Threshold Value
		2022	2023	
South Link Road ¹¹	Annual Mean PM ₁₀ ¹²	15.8	-	40 µg/m ³
	Days >50µg/m ³ ¹³	2	-	35 days
Heatherston Park	Annual Mean PM ₁₀	11.9	11.0	40 µg/m ³
	Days >50µg/m ³	0	1	35 days
Bishopstown MTU	Annual Mean PM ₁₀	14.4	11.4	40 µg/m ³
	Days >50µg/m ³	1	0	35 days
Cork Glanmire Rd	Annual Mean PM ₁₀	14.1	13.2	40 µg/m ³
	Days >50µg/m ³	0	2	35 days
Cork Airport	Annual Mean PM ₁₀	-	12.1	40 µg/m ³
	Days >50µg/m ³	-	0	35 days
Cork Port	Annual Mean PM ₁₀	-	12.3	40 µg/m ³
	Days >50µg/m ³	-	0	35 days

Measured concentrations of PM₁₀ for the years 2022 and 2023 are presented in Table 8-15 for Zone B monitoring stations. As is evident from these results, current levels of PM₁₀ are well below the annual mean limit value. In the year 2022, annual mean concentrations of PM₁₀ ranged from 11.9 – 15.8. ug/m³ across all Zone B stations, with no exceedance of short-term limit values (EPA, 2023). In the year 2023, annual mean concentrations of PM₁₀ ranged from

¹¹ There is no data for South Link Road in 2023 due to operational issues

¹² PM₁₀ annual mean limit value for the protection of human health: 40 ug/m³ per station

¹³ PM₁₀ daily limit for the protection of human health: No more than 35 days in a year >50 ug/m³ per station

11.0 – 13.2 $\mu\text{g}/\text{m}^3$ across all Zone B stations, with no exceedance of short-term limit values (EPA, 2024).

The average concentration of PM_{10} across all Zone B monitoring stations was 12 $\mu\text{g}/\text{m}^3$ in 2023 (EPA, 2024).

EPA 2023 background concentrations for Zone B stations have been used in combination with correction factors to estimate current annual average PM_{10} concentrations in the region of the Proposed Development. These factors have been adapted from both TII (2011) and DEFRA roadside NO_2 projection factors. Based on these correction factors, the estimated baseline year background PM_{10} concentration in the region of the Proposed Development is 11.9 $\mu\text{g}/\text{m}^3$.

8.3.2 Macroclimate

Ireland has a typical maritime climate, largely due to its proximity to the Atlantic Ocean and the presence of the Gulf Stream. Due to the moderating effects of the Gulf Stream, Ireland does not suffer the temperature extremes that are experienced by many other countries at a similar latitude. Mean annual temperatures generally range between 9°C and 10°C. Winters tend to be cool and windy while summers are mostly mild and less windy. The prevailing wind direction is between the south and west with average annual wind speeds ranging between 6 knots in parts of south Leinster to over 15 knots in the extreme north. Rainfall in Ireland occurs throughout the year with reasonable frequency. The highest rainfall occurs in the western half of the country and on high ground; and generally, decreases towards the northeast. As the prevailing winds are from the west-southwest, the west of Ireland experiences the largest number of wet days. The area of least precipitation is along the eastern seaboard of the country.

8.3.3 Microclimate

The synoptic meteorological station at Cork Airport is located approximately 43km southeast of the Proposed Development; and for the purposes of this chapter, weather data collected here may be considered similar to that which is experienced in the area of the site.

The weather in the area of the site is generally dominated by cool oceanic air masses, with cool winters, mild humid summers, and a lack of temperature extremes. Based on meteorological data at Cork Airport over the last 3 years, the mean January temperature is 5.8°C, while the mean July temperature is 15.8°C. The prevailing wind direction is from a quadrant centred on the southwest. These are moderately warm winds from the Atlantic and they habitually bring rain. The average annual rainfall in Cork is 1228.0mm. Easterly winds are less frequent, weaker, and tend to bring cooler weather from the northeast in spring and warmer weather from the southeast in summer.

8.3.3.1 Rainfall

Table 8-16 (on page 8-25) illustrates the monthly and annual rainfall data collected over a 4-year period (2021-2024) at Cork Airport Weather Station. The annual rates of precipitation ranged from 1150.7mm in 2022 to 1527.3mm in 2023 with distribution of the highest monthly rainfall values falling mainly in the autumn and winter months. This is broadly within the expected range of the southern half of the country.

Table 8-15 Monthly Rainfall Values (mm) for Cork Airport Weather Station from January 2021 to December 2024 (Source: Met Eireann)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2024	99.5	157.7	168.2	107.1	109.6	35.1	58.5	71.6	96.2	144.6	145.0	76.9	1270.0
2023	134.6	15.2	211.4	52.0	44.9	50.3	145.2	117.8	171.4	307.2	108.2	169.1	1527.3
2022	38.3	112.3	61.9	64.9	35.7	84.1	28.1	14.2	162.7	232.5	203.4	112.6	1150.7
2021	121.8	235.9	67.5	18.2	172.7	37.4	60.7	65.0	85.4	197.6	34.2	148.0	1244.4
Mean	131.4	97.8	97.6	76.5	82.3	80.9	78.8	96.8	94.6	138.2	120.0	133.1	1228.0

8.3.3.2 Wind

Wind at a particular location can be influenced by a number of factors, such as obstructions by trees or buildings, the nature of the terrain, and deflection by nearby mountains or hills. Wind blows most frequently from the south and west for open sites while winds from the northeast and north occur less often. The analysis of hourly weather data from Cork Airport synoptic weather station over a period of 30 years suggests that the predominant wind direction blows from the southwest, with windspeeds of between 7 and 10 knots occurring most frequently.

Figure 8-3 (on page 8-26) provides a wind speed frequency distribution which represents wind speed classes and the frequency at which they occur (% of time) at Cork Airport weather station over a period of 5 years. Wind speeds of 7 knots have the highest frequency, occurring approximately 8.5% of the time.

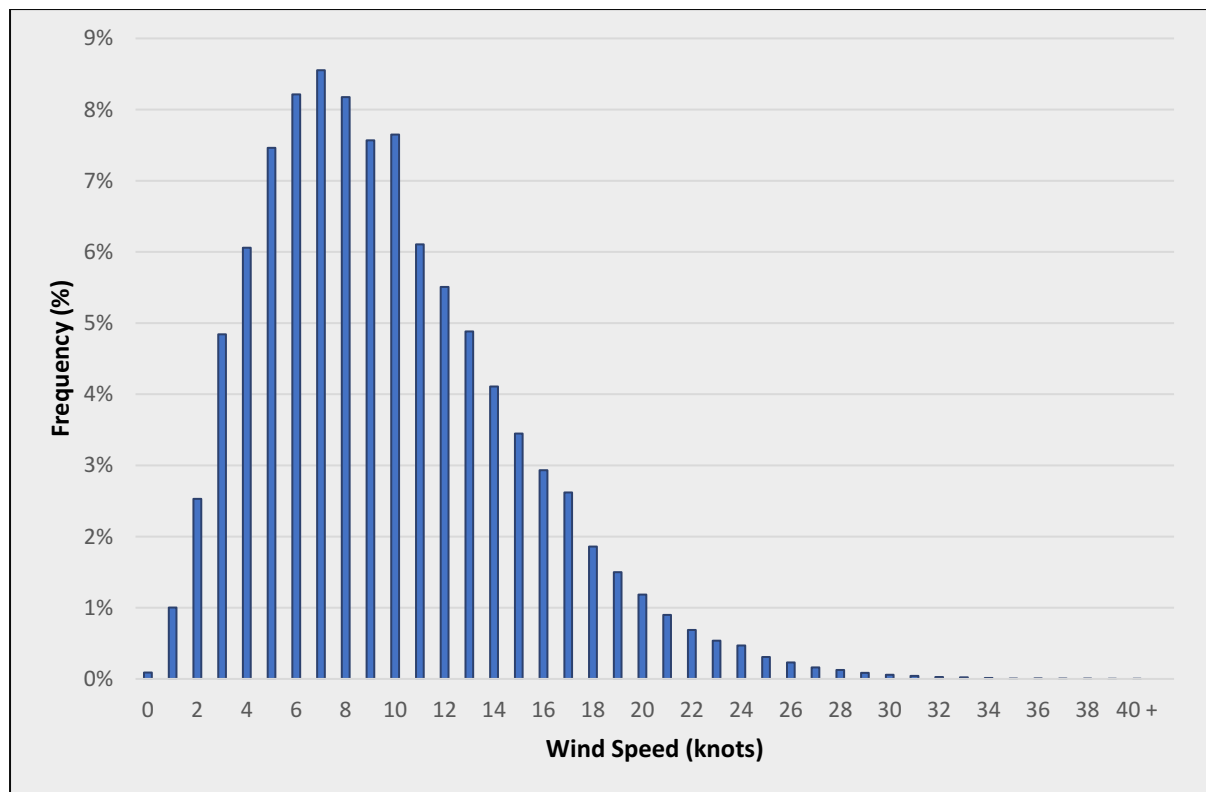


Figure 8-2 Wind Speed Distribution at Cork Airport Synoptic Weather Station over 30 years (1992-2021)

Figure 8-4 (on page 8-26) provides a wind rose of the predominant wind directions and associated wind speeds at Cork Airport. As is visible from Figure 8-4, the prevailing wind is from a south-westerly direction with an annual incidence of 29.40% for winds between 200 and 250 degrees. The most frequent wind speed associated with this wind direction is between 7 and 10 knots which is considered a 'gentle breeze' in terms of the Beaufort scale, this wind direction and wind speed occurs in combination approximately 9.76% of the time. The overall most common windspeed is also between 7 and 10 knots, occurring in 31.95% of incidences, and wind speeds of between 11 and 16 knots occurring in 26.99% of incidences.

The lowest frequency is for winds blowing from the northern quadrant at approximately 4.58% of the time. The incidence of wind between 1 and 6 knots is about 30.11% of the year with wind speeds of above 17 knots (8.7 m/s) occurring in just 10.86% of incidences. This windrose is broadly representative of the prevailing conditions experienced at the site.

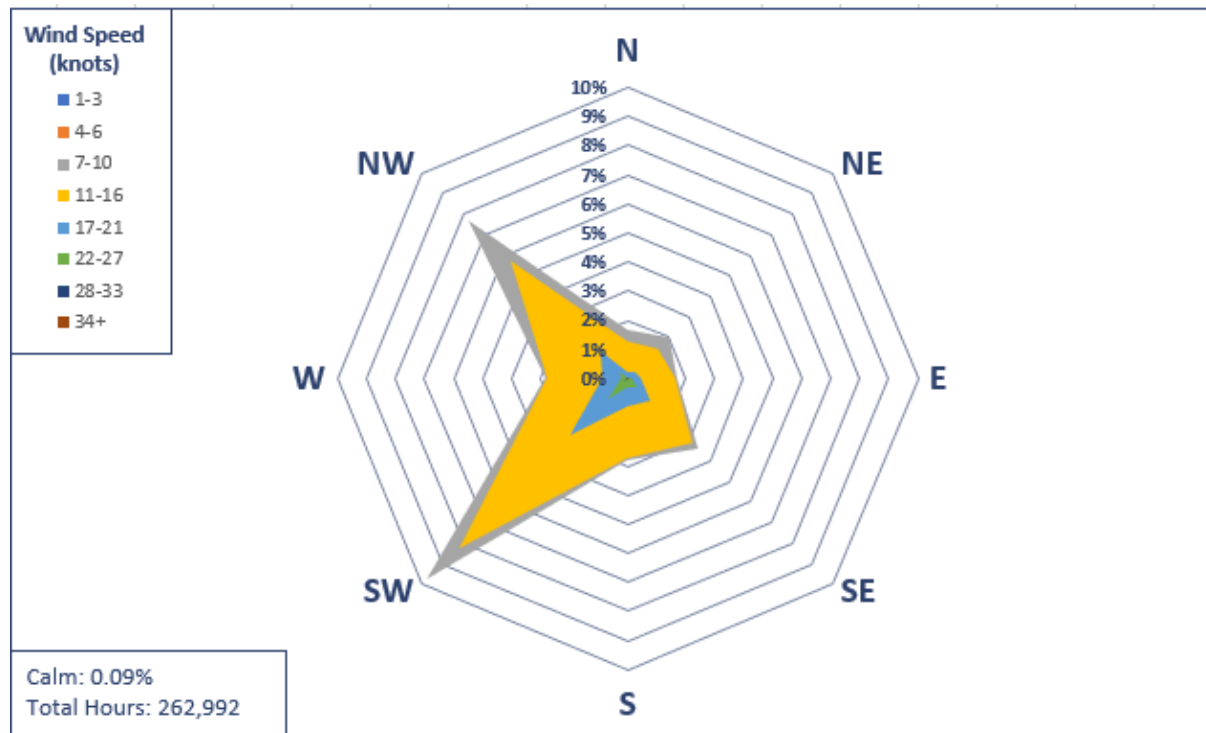


Figure 8-3 30-year Windrose at Cork Airport Synoptic Weather Station 1992-2021
(Developed using Met Eireann Hourly Data)

8.4 Characteristics of the Proposed Development

Chapter 3 sets out a description of the Proposed Development.

8.4.1 Aspects Relevant to this Assessment

8.4.1.1 Construction Phase

The aspects of the construction phase relevant to this chapter are as follows:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM₁₀, PM_{2.5} concentrations from demolition and construction activities (including earthworks and trackout); and
- An increase in concentrations of PM₁₀, PM_{2.5} and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

8.4.1.2 Operational Phase

The aspects of the operational phase relevant to this chapter are as follows:

- An increase in concentrations of PM₁₀ and PM_{2.5} and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site; and

- Emissions from aircraft operations, which are limited to light fixed-wing aircraft and HSE air ambulance helicopters, with no commercial jet traffic. Emissions are primarily generated during the LTO cycle, which includes taxiing, idling, take-off, climb-out, approach, and landing. These operations are expected to contribute to local concentrations of nitrogen oxides (NO_x), sulphur dioxide (SO₂), and particulate matter (PM₁₀ and PM_{2.5}).

8.5 Potential Effect of the Proposed Development

8.5.1 Construction Phase

8.5.1.1 Dust

There is potential for construction related air emissions to impact on local air quality due to the Proposed Development. The *IAQM Guidance on the Assessment of Dust from Demolition and Construction* (2024) provides a framework for the assessment of risk, details of which are provided in Section 8.2 of this chapter.

Potential Dust Emission Magnitude (Step 2A)

The potential magnitude of dust emissions from construction, earthworks and trackout has been assessed, as identified in Table 8-17.

Table 8-16 Dust Emission Magnitude for the site

Activity	Dust Emission Magnitude
Demolition	Large
Earthworks	Large
Construction	Large
Trackout	Medium

Sensitivity of the Area (Step 2B)

Table 8-18 outlines the sensitivity of the area to construction dust based on three factors: dust soiling, human health and ecology. The classification helps in assessing the potential effect of construction activities on air quality and guides mitigation.

Table 8-17 Sensitivity of the Area

Sensitivity Type	Factors	Sensitivity of Area	
		On-Site	Trackout
Dust Soiling	In order to account for a worst-case scenario, the sensitivity of the area has been classified as high for on-site activity (demolition, earthworks and construction) and trackout.	High	High
Human Health	EPA 2023 background concentrations for Cork Mallow have been used in combination with correction factors to estimate annual average PM ₁₀ concentrations in the region of the Proposed Development for 2024.	Low	Low

Sensitivity Type	Factors	Sensitivity of Area	
		On-Site	Trackout
	Based on these correction factors, the estimated current background PM ₁₀ concentration in the region of the Proposed Development is 11.9 µg/m ³ . As the PM ₁₀ concentration is less than 24 µg/m ³ , the sensitivity of the area to human health impacts is considered to be low.		
Ecology	As there is a Special Area of Conservation to the north of the site boundary, in order to account for a worst-case scenario, as per the ecological receptors can be classified as high sensitivity as per Table 8-5 for on-site activity (demolition, earthworks and construction) and trackout.	High	High

Risk of Dust Impacts (Step 2C)

The outcomes of the assessments of potential magnitude of dust emissions and the sensitivity of the area are combined to determine the risk of impact. This risk is then used to inform the selection of appropriate mitigation. Table 8-19 details the risk of dust impacts for demolition, earthworks, construction and trackout activities.

Table 8-18 Summary of Unmitigated Risks

Potential Impact	Sensitivity	Magnitude			
		Demolition	Earthworks	Construction	Trackout
		Large	Large	Large	Medium
Dust Soiling Impacts	High	High Risk	High Risk	High Risk	Medium Risk
Human Health Impacts	Low	Medium Risk	Low Risk	Low Risk	Low Risk
Ecological Impacts	High	High Risk	High Risk	High Risk	Medium Risk

The dust risk categories for each of the four activities determined in STEP 2C have been used to define the appropriate, site-specific, mitigation measures to be adopted in Section 8.6.1 of this chapter (Step 3 as per the *IAQM Guidance on the Assessment of Dust from Demolition and Construction* (2024) (see Section 8.2 of this chapter)).

For those cases where the risk is assigned as 'negligible', no mitigation measures beyond those required by legislation are required. However, additional mitigation measures as defined in Section 8.2 may be applied as part of good practice.

8.5.1.2 Traffic

There is also the potential for traffic emissions to affect air quality in the short-term over the construction phase, particularly due to the increase in HGVs accessing the site. Waterman Consulting Engineers (2025) have confirmed that the projected construction traffic volumes fall below the thresholds set out in the TII guidance.

However, as outlined in Section 8.2.2.2, the construction stage traffic has been reviewed against the scoping criteria set out in the TII guidance document Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (TII, 2022). None of the affected road links meet the thresholds for inclusion in a detailed local air quality assessment.

Specifically, the projected changes in traffic volumes, HDVs, speeds and road alignment fall below the defined criteria. Therefore, in accordance with TII Guidance, a detailed air quality assessment has been scoped out. This is considered a proportionate and appropriate approach, and no further assessment or precautionary measures are required.

It can be determined that the construction stage traffic will have a **direct, short-term, negative** and **imperceptible** effect on air quality and human health, which is overall not significant in EIA terms.

8.5.2 Operational Phase

8.5.2.1 Traffic

There is the potential for traffic emissions to affect air quality in the long-term over the operational phase. The operational phase traffic has been reviewed, and a detailed air quality assessment has been scoped out as none of the road links affected by the Proposed Development satisfy the TII scoping assessment criteria in Section 8.2.2.2.

It can be determined that the construction stage traffic will have a **direct, long-term, negative** and **imperceptible** impact on air quality and human health, which is overall not significant in EIA terms.

8.5.2.2 Air Traffic Emissions

The expansion of Rathcool Aerodrome will result in increased aircraft movements, which will contribute to local air pollutant concentrations during the operational phase. Emissions from aircraft engines include nitrogen oxides (NO_x), sulphur dioxide (SO₂), and particulate matter (PM₁₀ and PM_{2.5}). These pollutants were assessed through detailed air dispersion modelling carried out by DNV (2025) (see Appendix 8-1) to determine their potential impact on ambient air quality at and beyond the aerodrome boundary.

The air dispersion modelling results demonstrate that emissions from the Proposed Development will not result in exceedances of any Irish or EU ambient air quality standards for human health or ecological protection under either typical or worst-case operational scenarios. Key findings include:

Human Health

Predicted concentrations of NO₂, PM₁₀, PM_{2.5} and SO₂ at all sensitive receptors are well below statutory limits, with the highest values typically less than 40% of the relevant thresholds. The maximum short-term NO₂ and SO₂ concentrations occur at the site boundary, not at sensitive receptors, and remain comfortably within compliance margins.

Ecosystem Protection

The annual mean NO_x concentration at the Blackwater River SAC approaches, but does not exceed, the ecosystem protection standard (95% of the 30 µg/m³ limit in Scenario B). SO₂ levels at the SAC are very low relative to the ecosystem standard. The modelling approach is

conservative, assuming worst-case meteorology, continuous operation, and maximum activity rates.

Spatial Distribution

The highest concentrations are confined to the immediate vicinity of the runway and taxiway, with rapid dispersion and dilution resulting in much lower concentrations at residential and ecological receptors.

Background Air Quality

The area is characterised by good background air quality, with low measured concentrations of NO₂, PM₁₀, PM_{2.5} and SO₂ at the nearest EPA monitoring stations. The incremental impact of the Proposed Development is therefore minor relative to existing conditions.

Model Conservatism

The assessment incorporates conservative assumptions, including continuous operation, maximum hourly activity, and worst-case meteorological years. Actual impacts are likely to be lower in practice.

Conclusion

The Proposed Development will not cause or contribute to any exceedance of ambient air quality standards for human health or ecosystems. The predicted impacts are minor and localised, with no significant risk to nearby residents or sensitive ecological sites. Ongoing compliance with air quality legislation is expected.

8.5.3 Potential Cumulative Effects

The EC *Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions*, defines cumulative effects as “impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor.

Cumulative air quality effects have the potential to arise locally when construction activities associated with the Proposed Development occur simultaneously with other developments in the area.

A review of other off-site developments was completed as part of this assessment. Chapter 2 of this EIAR details the existing, proposed and granted planning permissions on record in the area, a review of these planning permissions has been completed as part of this assessment.

The cumulative effects on the air quality of the current Proposed Development and other permitted or existing developments have been considered in relation to construction dust, road traffic emissions and aircraft operations. The potential effects on air quality are assessed in Section 8.5 and it is concluded that there are no other potentially significant cumulative effects associated with the Proposed Development and considered offsite permitted developments.

In terms of dust, no significant effects are predicted; good construction practice, which incorporates the implementation of the identified mitigation measures, will be employed at the Proposed Development site.

Assessment of road traffic emissions on air quality was based on traffic data that includes contributions of traffic from other existing and permitted developments on the surrounding road network. Similarly, aircraft emissions have been considered in the context of the aerodrome's scale and operational profile, and no significant cumulative effects are anticipated due to the low frequency and intensity of aircraft movements.

It is considered that the cumulative emissions from the Proposed Development, when assessed alongside other developments in the area, will not result in exceedances of ambient air quality standards.

It is concluded that there are no other potentially significant cumulative effects on air quality arising from the Proposed Development in combination with the identified existing and permitted off-site developments, as described in Chapter 2 of this EIAR.

8.5.4 “Do Nothing” Effect

If the Proposed Development were not to proceed, ambient air quality at the site will remain as per the baseline and will change in accordance with trends within the wider area (including influences from potential new developments in the surrounding area, changes in road traffic etc). Under the Do-Nothing Scenario, construction works associated with the Proposed Development will not take place. Effects from increased traffic volumes and associated emissions from the Proposed Development will also not occur.

8.6 Avoidance, Remedial and Mitigation Measures

8.6.1 Construction Phase

To minimise potential air quality impacts during construction, a suite of best practice mitigation measures will be implemented at the Proposed Development site. These measures are informed by guidance from the IAQM (2024) and are designed to effectively manage dust and emissions. The following measures will be adopted as appropriate to the scale and nature of the works:

Communications

- Develop and implement a stakeholder communications plan that clearly outlines how engagement will occur before work commences on site. This plan should include:
 - Establishing an online information page dedicated to the Proposed Development, which will provide:
 - Project updates and timelines;
 - Contact details for key personnel; and
 - A clear process for submitting queries or complaints.
 - Providing a complaints feedback mechanism, including:
 - A dedicated section of the website for complaints feedback and/or provision of contact details; and

- A log of complaints and responses to ensure transparency;
- Display on the site boundary:
 - The name and contact details of person(s) accountable for air quality and dust issues (e.g., Environmental Manager/Engineer or Site Manager); and
 - Contact details for the head or regional office.
- Publicise the complaints process on both the site signage and online page to ensure members of the public know how to raise concerns.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked;
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book; and
- Hold regular liaison meetings with other high risk construction sites within 250m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

Monitoring

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100 m of site boundary, with cleaning to be provided if necessary; and
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Preparing and Maintaining the site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below; and
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable; and
- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved haul roads.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and
- Only remove the cover in small areas during work and not all at once.

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Measures Specific to Trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;

- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in a site log book;
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowzers and regularly cleaned;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and
- Access gates to be located at least 10 m from receptors where possible.

8.6.2 Operational Phase

Due to the scale and nature of the Proposed Development, the potential for significant air quality impacts during the operational phase is considered low. Nonetheless, appropriate mitigation measures are proposed to ensure that emissions from aircraft and associated ground activities are minimised. These measures reflect best practice for low-intensity aviation operations and are designed to support the long-term environmental sustainability of the site, in line with the objectives of the EIA Directive. The following measures will be adopted as appropriate to the scale and nature of the works:

- Minimising Engine Idling: Pilots and operators will be encouraged to minimise unnecessary engine idling during taxiing and pre-flight checks;
- Efficient Operational Practices: Adoption of efficient ground movement practices to reduce fuel use and associated emissions;
- Use of Low-Emission Aircraft: Where feasible, promotion of the use of light aircraft with lower emission profiles, including electric or hybrid models as they become more widely available; and
- Awareness and Education: Engagement with aerodrome users to raise awareness of air quality considerations and promote environmentally responsible flying practices.

8.6.3 “Worst Case” Scenario

A worst-case scenario has been applied in Step 2A (defining the potential dust emission magnitude) of the construction dust impact assessment and the highest risk category has been used to inform the selection of appropriate mitigation measures for the Proposed Development.

It is expected that adequate mitigation measures, as outlined in Section 8.6.1, will assist in preventing nuisance dust from resulting in any significant effects. However, even with the most rigorous Dust Management Plan (DMP) in place, it is not possible to guarantee that the dust mitigation measures will be effective all the time, and if, for example, dust emissions occur under adverse weather conditions, or there is an interruption to the water supply used for dust suppression, the local community may experience occasional, short-term dust annoyance. The likely scale of this would not be considered sufficient to change the conclusion that with mitigation the effects will be ‘not significant’.

The traffic data used in the assessment includes projected volumes from the Proposed Development as well as existing and permitted off-site developments. This cumulative approach represents a worst-case scenario in terms of potential traffic-related air emissions, even though the resulting volumes remained below the thresholds set out in TII guidance. As such, a detailed air quality assessment was scoped out, and the associated effects are considered not significant in EIA terms.

8.7 Residual Effects

The IAQM recommends that significance is only assigned to effects after considering the construction activity mitigation. The risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3 (see Section 8.6.1 of this chapter). The final step is to determine whether there are significant effects arising from the construction phase of the Proposed Development. With the proposed mitigation measures in place, the residual effects from construction dust are predicted to be not significant.

The traffic generated by the Proposed Development has been assessed for its effect on air quality and it has been determined to have an overall not significant effect in terms of local air quality.

Emissions associated with aircraft operations during the operational phase of the Proposed Development were assessed in the Air Emissions Assessment (DNV, 2025) using the U.S. EPA-approved AERMOD dispersion model in accordance with EPA AG4 (2020). The modelling demonstrates that predicted concentrations of NO₂, PM₁₀, PM_{2.5} and SO₂ at all sensitive receptors are well below Irish and EU ambient air quality standards. The highest concentrations occur at the site boundary and remain comfortably within compliance margins. The incremental impact on human health and ecological receptors is minor and localised, and the residual effect is assessed as not significant.

Therefore, it is concluded that the Proposed Development will not give rise to any significant adverse residual effects in terms of air quality. The site is considered suitable for the Proposed Development from an air quality perspective.

8.8 Monitoring

8.8.1.1 Construction Phase

The monitoring of construction dust during the construction phase of the Proposed Development is recommended to ensure that effects are not experienced beyond the site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at strategic locations along the site boundary for a period of 30 +/- 2 days. The selection of sampling point locations should be carried out in consideration of the requirements of VDI 2119 with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the gauges should be removed from the site; the dust deposits in each gauge will then be determined gravimetrically and expressed as a dust deposition rate in mg/m²/day in accordance with the relevant standard.

8.8.1.2 Operational Phase

Given the limited scale and nature of operations at the Proposed Development, continuous ambient air quality monitoring is not considered necessary. Instead, a complaint log will be maintained to record and respond to any air quality-related concerns raised by members of the public or local stakeholders. Should complaints indicate a potential issue, or if there is a significant change in operational activity, a reassessment of air quality impacts may be undertaken to ensure continued compliance with relevant standards.

8.9 Interactions

Interactions between Air Quality and other aspects of this EIAR have been considered in this section of the chapter. This chapter has been informed by, and should be read in conjunction with, other relevant chapters including Population and Human Health, Biodiversity, Land and Soils, Climate, and Traffic and Transport, to ensure a consistent and comprehensive assessment of potential interactions.

8.9.1 Population and Human Health

The Proposed Development has the potential to generate dust during construction and emissions from traffic and aircraft during operation, which could affect nearby sensitive receptors if not properly managed. However, the mitigation measures employed at the Proposed Development, as outlined in Section 8.6.1, will ensure that all effects are compliant with ambient air quality standards, and that exposure levels remain below thresholds known to impact human health.

Detailed dispersion modelling confirms that emissions from aircraft operations will not result in exceedances of any statutory limits, and the incremental contribution to local air quality is minor. Traffic-related pollutants have also been assessed and determined to have an overall not significant effect. Given the scale and nature of the aerodrome and its operational profile, air quality effects from the Proposed Development are not expected to have any significant adverse effect on population and human health. This chapter should be read in conjunction with Chapter 4 (Population and Human Health) to provide a comprehensive understanding of potential health-related interactions.

8.9.2 Biodiversity

Interactions between air quality and biodiversity have been considered in conjunction with Chapter 5 (Biodiversity). During the construction phase, dust emissions could potentially affect nearby habitats and species. However, the mitigation measures outlined in the chapter will minimise dust deposition, and no significant impacts on designated sites or sensitive ecological receptors are anticipated.

During the operational phase, emissions from aircraft and associated ground activities have also been considered. Dispersion modelling demonstrates that pollutant concentrations at ecological receptors, including the Blackwater River SAC, remain within applicable air quality standards, with the annual mean NO_x approaching but not exceeding the ecosystem protection limit under worst-case conditions. Given the low frequency of aircraft movements and the conservative nature of the modelling assumptions, the potential for significant impacts

on biodiversity is considered to be low, and no adverse effects on designated sites are expected.

8.9.3 Land and Soils

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential to generate dust, which may interact with land and soils. This interaction has been considered alongside Chapter 6 (Land and Soils). With the application of the appropriate dust control measures, no significant effects are predicted during the construction phase. There are no potentially significant interactions identified during the operational phase between air quality and land and soils.

8.9.4 Climate

Air quality and climate are linked because they share common emission sources, particularly from the combustion of fossil fuels during both the construction and operational phases of the Proposed Development. These activities generate pollutants that affect local air quality (e.g., NO_x, PM₁₀, PM_{2.5}) and greenhouse gases (e.g., CO₂) that contribute to global climate change.

During the operational phase, emissions arise primarily from aircraft movements and associated ground vehicles. While air quality does not directly influence climate, both assessments use the same activity data to ensure consistency.

The climate assessment (see Chapter 9) concludes that, following the implementation of all mitigation measures and best practice, the Proposed Development will not give rise to any significant effects on climate change during either the construction or operational phases.

8.9.5 Traffic

There can be a significant interaction between air quality and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect air quality have been deemed not significant. Therefore, the effect of the interaction between air quality and traffic is not significant.

8.10 Difficulties Encountered When Compiling

No difficulties have been encountered while compiling this chapter.

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9 CLIMATE

9.1 Introduction

This chapter of the EIAR identifies, describes, and presents an assessment of the eventual significant direct and indirect effects of the Proposed Development at the Townlands of Rathcool and Knockcahill, Co. Cork on climate (for example greenhouse gas (GHG) emissions) and its vulnerability to climate change.

It should be read in conjunction with Ch. 08 Air Quality, Ch. 14 Material Assets, Ch. 13 Traffic and Transport. As well as the Site-Specific Flood Risk Assessment submitted with the planning application.

The construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing operations building and paramedic base building to the east of the site, and construction of a new operations and paramedic base building to the west of the site; and the demolition of an existing helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary wastewater treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, the upgrade of an existing entrance onto the L-5215-0 road, site landscaping and all other associated site development works.

A full description of the development can be found in Chapter 3.

Climate change is recognised as one of the most serious global environmental problems and arguably the greatest challenge facing humanity today. While natural variations in climate over time are normal, anthropogenic activities have interfered greatly with the global atmospheric system by emitting substantial amounts of greenhouse gases (GHGs). This has caused a discernible effect on our global climate system, with continued change expected due to current and predicted trends of GHG emissions. In Ireland this is demonstrated by rising sea levels, changes in the ecosystem, extreme weather events and biodiversity loss.

The GHG assessment evaluates the project's climate impact across different life stages, considering a 50-year building life expectancy. It categorises greenhouse gas emissions into four main stages based on BS EN 15978: Production (embodied carbon from raw material extraction to product manufacturing), Pre-construction/Construction (impacts from product delivery and assembly), Operational (emissions from building operations, maintenance, and replacement), and End of Life (deconstruction and disposal activities). The assessment includes the first three stages, while the End-of-Life stage is excluded due to uncertainties in deconstruction methods. Attention will be focused on Ireland's obligations under the Paris Agreement (Climate Action Plan & Corresponding carbon budgets) in the context of the overall climatic impact of the presence and absence of the Proposed Development.

9.1.1 Quality Assurance and Competency of Experts

This chapter of the EIAR has been prepared by Aoife Gillen of DNV, Aoife holds a Master of Science (Hons) degree, is a Chartered Environmental Health Practitioner, and Certified Energy Manager. Aoife has worked as a Principal Sustainability Consultant with DNV since March 2024 and has built up experience preparing Climate Change Impact Assessments, Environmental Impact Assessment (EIA) Reports, Climate Chapters, Climate Impact Statements and Carbon assessments. Aoife has been involved in the following projects:

- N&C Kilmeague Quarry GHG Assessment
- Dyke Road Galway LRD Climate Change Impact Assessment
- DRES Properties Railpark Maynooth LRD Climate Chapter
- Kilmore Quay Tourism Resort Climate Chapter
- LDA Galway Port LRD Climate Chapter
- Galway Port LRD Climate Chapter
- JSA Smurfit Paper Mills Climate Action & Sustainability Statement
- Rathmullan LRD Climate Chapter

9.2 Greenhouse Gas Emissions in Ireland

Ireland's latest GHG emissions 1990-2024 are based on the Sustainable Energy Authority Ireland's (SEAI's) provisional energy balance released in June 2025 (EPA, 2025). Total national greenhouse gas emissions in 2024 (excluding LULUCF) are estimated to be 53.75 million tonnes carbon dioxide equivalent (Mt CO₂eq) which is 2.0% lower (or 1.09 Mt CO₂eq) than emissions in 2023 (54.85 Mt CO₂eq) and follows a 6.8% decrease in emissions reported for 2023. Emissions in 2024 are 3.6% lower than the historical 1990 baseline. National total emissions including Land Use Land Use Change and Forestry (LULUCF) decreased by 1.9% to 57.65 Mt CO₂eq. ETS4 and ESR emissions decreased by 7.4% and 0.5% respectively (EPA, 2025).

Arresting growth in emissions is a challenge in the context of a growing economy but one which must continue to be addressed by households, business, farmers and communities if Ireland is to reap the benefits of a low-carbon economy.

The GHG emission inventory for 2024 is the fourth of ten years over which compliance with targets set in the European Union's Effort Sharing Regulation (EU 2018/842) will be assessed. This Regulation sets 2030 targets for emission reductions outside of the Emissions Trading Scheme (known as ESR emissions) and annual binding national limits for the period 2021-2030. Ireland's target is to reduce ESR emissions by 42% by 2030 compared with 2005 levels, with a number of flexibilities available to assist in achieving this. The ESR includes the sectors outside the scope of the EU Emissions Trading System (ETS) (such as Agriculture, Transport, Residential, Public Services and Commercial Services and Waste).

Ireland's ESR emissions annual limit for 2024 is 38.68 Mt CO₂eq. Ireland's provisional 2024 GHG ESR emissions are 42.42 Mt CO₂eq; this is 3.74 Mt CO₂eq more than the annual limit for 2024, see Table 9-4 and Figure 5. This value is the national total emissions less emissions generated by stationary combustion, i.e., power plants, cement plant, and domestic aviation operations that are within the EU's emissions trading scheme. Cumulatively from 2021-2024 and after using the ETS flexibility, Ireland is not in compliance with the ESR by a net distance to target of -1.30 Mt CO₂eq. In 2024, there is an exceedance of 1.83 Mt CO₂eq above its

Annual Emissions Allocation with the ETS flexibility. Agriculture and Transport accounted for 75.4% of total ESR emissions in 2024. The revised LULUCF Regulation (2023)¹⁰ incorporates new rules around LULUCF flexibilities for the period 2021-2025 and 2026-2030. There is a high degree of uncertainty relating to the availability of the LULUCF flexibility and, if available, the quantity of flexibility in each budgetary period (EPA, 2025).

The latest projections (May 2025) indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 10% on 2005 levels by 2030, significantly short of the 42% reduction target. If measures in the higher ambition (With Additional Measures) scenario are implemented, EPA projections show that Ireland can achieve a reduction of 22% by 2030, still short of the 42% reduction target.

In terms of the 2030 targets, the ESR provides two flexibilities (use of ETS allowances and credit from action undertaken in the land use, land use change and forestry (LULUCF) sector) to allow for a fair and cost-efficient achievement of the targets. New Regulations in 2023 mean there are new rules around LULUCF flexibility that incorporates split budgets 2021-2025 to 2026-2030^[1]. Additional analyses are needed to estimate the impact of the new rules on flexibilities. In the interim, based on latest LULUCF inventory and projections data, the maximum amount of LULUCF flexibility now projected to be available is 13.4 Mt CO₂eq in the first 5-year period (or 2.68 Mt CO₂eq per annum), with no flexibility available in the second 5-year period.

Ireland's GHG (GHG) emissions increased in the period from 1990 to 2001 where it peaked at 70.85 Mt CO₂ equivalent, before displaying a downward trend to 2014. Emissions increased by 4.0% and 3.8%, respectively in the years, 2015 and 2016 and remained relatively stable in 2017 and 2018, followed by a 3.0% decrease in 2019. In 2020 total national GHG emissions were 3.6% lower than 2019 emissions largely driven by the covid restrictions. The gradual lifting of covid restrictions in 2021 along with an increase in the use of coal and less renewables within electricity generation resulted in a 4.5% increase in emissions in 2021 compared to 2020. A 2.1% decrease in emissions was seen in 2022 compared to 2021, mainly due to a substantial decrease in residential sector emissions combined with decreases from industry, agriculture and electricity generation. This was followed by a 6.8% reduction in emissions in 2023 and 2% in 2024 on 2023 levels. Ireland's GHG emissions have decreased by 3.6% from 1990-2024.

In relation to the GHGs; carbon dioxide (CO₂) accounted for 61.1% of the total, with methane (CH₄) and nitrous oxide (N₂O) contributing 28.9% and 8.8% as CO₂ equivalent, respectively and F-gases contributing 1.2% of the total as CO₂ equivalent.

Agriculture is the largest contributor to the overall emissions at 38.0% of the total (excluding LULUCF). Transport and Energy Industries are the second and third largest contributors at 21.7% and 13.3%, respectively. Residential and Manufacturing Combustion emissions account for 10.4% and 7.7%, respectively. These five sectors accounted for 91.1% of national total emissions in 2024. The remainder is made up by the Industrial Processes sector at 3.5%, F-Gases at 1.1%, Commercial Services at 1.4%, Public Services at 1.3% and Waste at 1.6%.

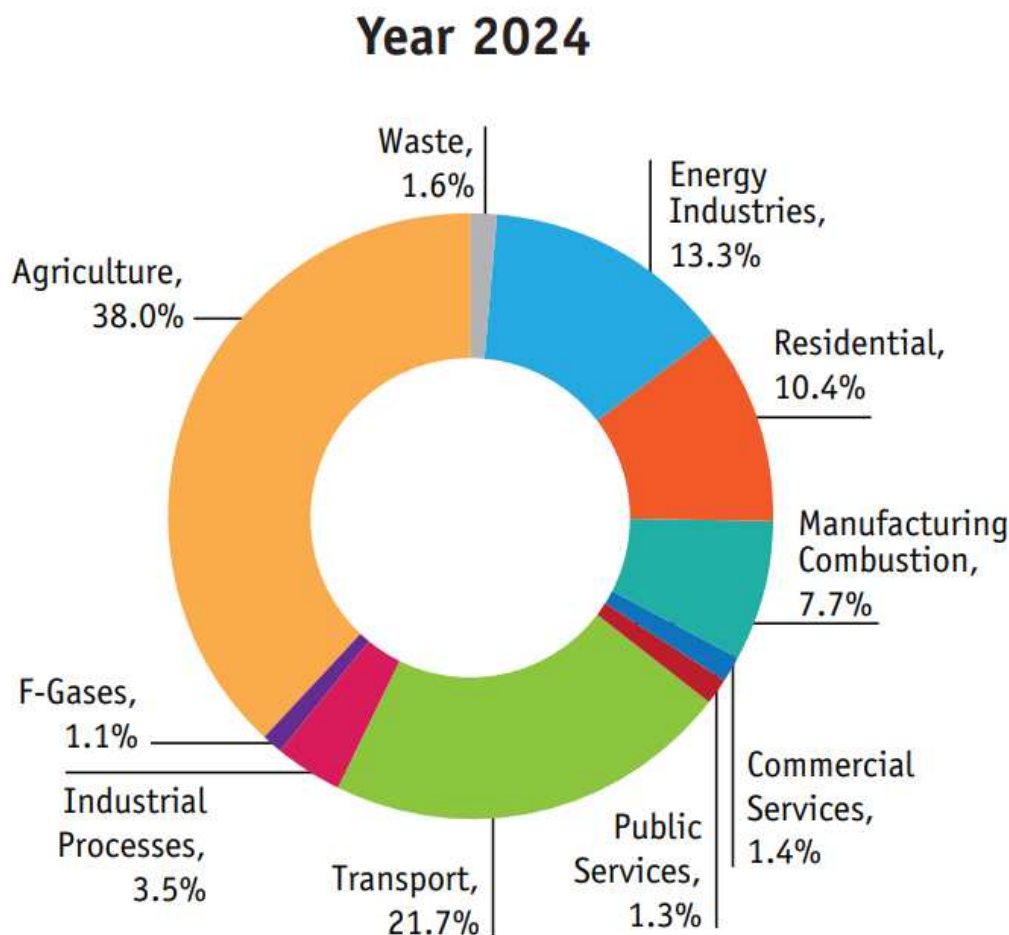


Figure 9-1 Ireland's Greenhouse Gas Emissions Share by Sector 2024 (Source: EPA, 2025)

The Climate Change Advisory Council submitted their Annual Review 2023 to the Minister of the Environment, Climate and Communications on 24th of June 2024. Detailed key messages, including observations and recommendations for each sector (electricity; transport; built environment; enterprise and waste; agriculture, forestry and other land use; and biodiversity), can be found at the beginning of each chapter in the annual review (CCAC, 2024). The overall recommendations are as follows:

- The Council strongly recommends that the Government urgently conducts a full review of taxation in the Transport sector (including vehicle registration tax, motor tax, excise duty, carbon tax, fuel pricing and distance-based charges) to ensure that taxation policy for households and businesses supports emission targets, is aligned with climate objectives, promotes energy efficiency and minimises negative impacts on society.
- Government and local authorities should reallocate road space to provide better access for more sustainable modes of transport, such as walking, cycling or taking a bus. Public transport services need to improve, and more public engagement is needed to understand the barriers people face in making sustainable transport choices.
- The Government must urgently complete the planning reform necessary to:

- ensure that new developments reduce transport demand by placing homes, workplaces, public services and leisure spaces closer to each other and nearer to public and active transport (e.g. walking and cycling) infrastructure,
 - speed up the delivery of major public and active transport infrastructure projects and minimise the costs and delays associated with the planning process.
- Local authorities must have the support and guidance from Government that they need to reduce transport demand and emissions, with locally implemented measures such as low-emission zones and provision of shuttle bus services or incentives to promote carpooling.
- The number of car journeys to and from schools needs to be reduced by significantly expanding the School Transport Scheme and continuing work to increase the number of pupils walking and cycling to school and
- The Government needs to prioritise measures and investments to strengthen the resilience of ports and critical roads and railways to the future impacts of climate change such as more intense rainfall events and sea level rise

9.3 Legislation, Policy and Guidance

The key legislation and guidance referenced in the preparation of the EIAR is outlined in Chapter 1: Introduction (Sections 1.5, 1.6 and 1.7). Specific to Climate, the following legislation, guidance, and planning framework relevant to the consideration of this factor has informed the assessment as outlined below.

9.3.1 International Legislation/Commitments/Agreements

In March 1994, the United Nations Framework Convention on Climate Change (UNFCCC) was established as an intergovernmental effort to tackle the challenges posed by climate change. The Convention membership is almost universal, with 197 countries having ratified. Under the Convention, governments gather and share information on GHG emissions, national policies, and best practices. This information is then utilised to launch national strategies and international agreements to address GHG emissions. Following the formation of the UNFCCC, two major international climate change agreements were adopted: The Kyoto Protocol, and the Paris Agreement.

In April 1994, Ireland ratified the United Nations Framework Convention on Climate Change (UNFCCC) and subsequently signed the Kyoto Protocol in 1997. The Kyoto Protocol is an international agreement linked to the UNFCCC which commits its parties to legally binding emission reduction targets. In order to ensure compliance with the protocol, the Intergovernmental Panel on Climate Change (IPCC) has outlined detailed guidelines on compiling National GHG Inventories. These are designed to estimate and report on national inventories of anthropogenic GHG emissions and removals. Under Article 4 of the Kyoto Protocol, Ireland agreed to limit the net anthropogenic growth of the six named GHGs to 13% above the 1990 level, spanning the period 2008 to 2012 (IPCC, 2006).

The second commitment period of the Kyoto Protocol was established by the Doha amendment which was adopted in extremis on the 8th of December 2012, to impose quantified emission limitation and reduction commitments (QELRCs) to Annex I (developed country) Parties during a commitment period from 2013 to 2020. 38 developed countries, inclusive of

the EU and its 28 member states, are participating. Under the Doha amendment, participating countries have committed to an 18% reduction in emissions from 1990 levels. The EU has committed to reducing emissions in this period to 20% below 1990 levels. Ireland's QELRCs for the period 2013 to 2020 is 80% of its base year emissions. Ireland's compliance with the Doha amendment was assessed based on the GHG inventory submission in 2022 for 1990-2020 data. Ireland complied procedurally with its submission obligations under the Doha Amendment, by delivering a complete 1990–2020 inventory in 2022 and its submission has been considered acceptable. As of October 2020, the Doha Amendment has received the required number of ratifications to enter into force. Once in force, the emission reduction commitments of participating developed countries and economies in transition (EITs) become legally binding.

The Sustainable Development Goals (SDGs), also known as the Global Goals, were adopted by all United Nations Member States in 2015 as a universal call to action to end poverty, protect the planet, and ensure that all people enjoy peace and prosperity by 2030. The 17 SDGs are integrated—that is, they recognise that action in one area will affect outcomes in others, and that development must balance social, economic, and environmental sustainability. The creativity, knowhow, technology and financial resources from all of society is necessary to achieve the SDGs in every context. At its heart, the SDGs are about global partnership for this call to action. No matter how large or small, and regardless of their industry, all companies can contribute to the SDGs through their sustainability and corporate social responsibility strategies, policies, and processes.



Figure 9-2 UN Sustainable Development Goals (Source: [THE 17 GOALS | Sustainable Development](#))

Ireland has published a Sustainable Development Goals National Implementation Plan 2022-2024 to provide a whole-of-government approach to implementing these goals. Sustainable development, climate change and equity are intrinsically intertwined. Climate change impacts can be linked in one way or another to all 17 of the UN Sustainable Development Goals

(SDGs). Climate action that considers co-impacts across other SDGs can increase efficiency, reduce costs and support early and ambitious climate action (DECC, 2022).

9.3.2 European Legislation

GHG Legislation

In December 2015, the Paris Climate Change Conference (COP21) took place and was an important milestone in terms of international climate change agreements. The Paris Agreement sets out a global action plan to put the world on track to mitigate dangerous climate change by setting a global warming limit not to exceed 2°C above pre-industrial levels, with efforts to limit this to 1.5°C. As a contribution to the objectives of the agreement, countries have submitted national climate action plans (nationally determined contributions, (NDCs)). Under this agreement, governments agreed to come together every 5 years to assess the collective progress towards the long-term goals and inform Parties in updating and enhancing their nationally determined contributions. Ireland will contribute to the Paris Agreement through the NDC tabled by the EU on behalf of Member States in 2020, which commits to a 55% reduction in EU-wide emissions by 2030 compared to 1990. This is considered to be the current NDC maintained by the EU and its Member States under Article 4 of the Paris Agreement.

The EU has set itself targets for reducing its GHG emissions progressively up to 2050, these are outlined in the 2020 climate and energy package and the 2030 climate and energy policy framework. These targets are defined to assist the EU in transitioning to a low-carbon economy, as detailed in the 2050 low carbon roadmap. The 2020 package is a set of binding legislation to ensure that the EU meets its climate and energy targets for the year 2020 (EEA; 2020). There are three key targets outlined in the package which were set by the EU in 2007 and enacted in legislation in 2009:

- 20% reduction in GHG emissions from 1990 levels;
- 20% of EU energy to be from renewable sources; and
- 20% improvement in energy efficiency.

The 2030 climate and energy framework builds on the 2020 climate energy package and was adopted by EU leaders in October 2014. The framework sets three key targets for the year 2030:

- At least 40% cuts in GHG emissions from 1990 levels;
- At least 32% share for renewable energy; and
- At least 32.5% improvement in energy efficiency.

The EU has acted in several areas in order to meet these targets, including the introduction of the Emissions Trading System (ETS). The ETS is the key tool used by the EU in cutting GHG emissions from large-scale facilities in the power, industrial, and aviation sectors. Around 45% of the EU's GHG emissions are covered by the ETS.

As part of the European Green Deal, the EU Commission proposed in September 2020 to raise the 2030 GHG emission reduction target, including emissions and removals, to at least 55% compared to 1990. The European Climate Law came into force in July 2021 and writes into law the goal set out in the European Green Deal for Europe's economy and society to

become climate-neutral by 2050. The law also sets the intermediate target of reducing net GHG emissions by at least 55% by 2030, compared to 1990 levels.

Corporate Sustainability Reporting Directive (CSRD)

On 5 January 2023, the Corporate Sustainability Reporting Directive (CSRD) entered into force. It modernises and strengthens the rules concerning the social and environmental information that companies must report. The CSRD is effective from 01 January 2024 for those entities already subject to the NFRD (reporting in 2025) and from 01 January 2025 for all other large companies (reporting in 2026).

Companies subject to the CSRD will have to report according to European Sustainability Reporting Standards (ESRS). The standards are developed in a draft form by the [EFRAG](#), previously known as the European Financial Reporting Advisory Group (EFRAG, 2024).

If the client falls in scope for CSRD, the results from this current Climate Chapter should be reviewed in line with the materiality assessment and annual CSRD disclosure requirements. Specifically, the findings may serve as an evidence base for EFRAG Standard ESRS E1 CLIMATE CHANGE.

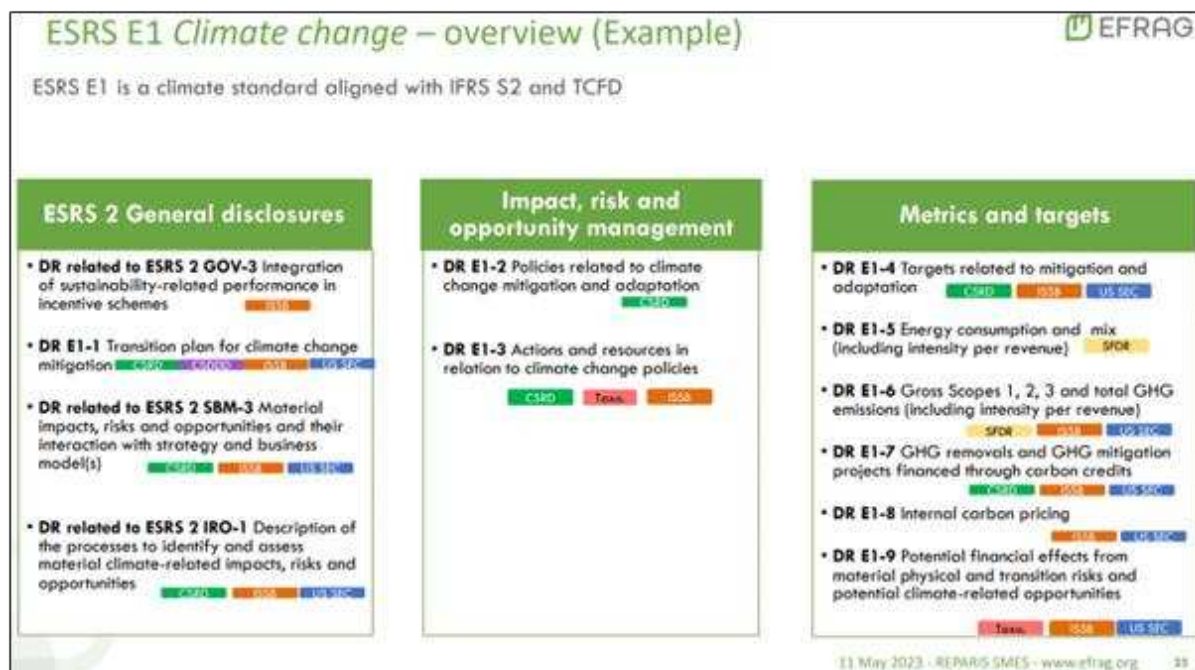


Figure 9-3 ESRS E1 Climate Change: presented by Eric Duvaud, EFRAG SR TEG member (Source: [The first set of ESRS – the journey from PTF to delegated act \(adopted on 31 July 2023\) – EFRAG](#))

The data/information from this Climate Chapter should be considered for Impact, Risk and Opportunity Management Disclosure Requirements 20 and 21 below within ESRS E1 CLIMATE CHANGE (EFRAG; 2023):

20. The undertaking shall describe the process to identify and assess climate-related impacts, risks and opportunities. This description shall include its process in relation to:

- (a) impacts on climate change, in particular, the undertaking's GHG emissions (as required by Disclosure Requirement ESRS E1-6);

(b) climate-related physical risks in own operations and along the upstream and downstream value chain, in particular:

- i. the identification of climate-related hazards, considering at least high emission climate scenarios; and
- ii. the assessment of how its assets and business activities may be exposed and are sensitive to these climate-related hazards, creating gross physical risks for the undertaking.

(c) climate-related transition risks and opportunities in own operations and along the upstream and downstream value chain, in particular:

- i. the identification of climate-related transition events, considering at least a climate scenario in line with limiting global warming to 1.5°C with no or limited overshoot; and
- ii. the assessment of how its assets and business activities may be exposed to these climate-related transition events, creating gross transition risks or opportunities for the undertaking.

21. When disclosing the information required under paragraphs 20 (b) and 20 (c) the undertaking shall explain how it has used climate-related scenario analysis, including a range of climate scenarios, to inform the identification and assessment of physical risks and transition risks and opportunities over the short-, medium- and long-term.

Corporate Sustainability Due Diligence Directive (CSDDD)

This proposed Directive establishes a corporate due diligence duty. The core elements of this duty are identifying, bringing to an end, preventing, mitigating and accounting for negative human rights and environmental impacts in the company's own operations, their subsidiaries and their value chains. In addition, certain large companies must have a plan to ensure that their business strategy is compatible with limiting global warming to 1.5 °C in line with the Paris Agreement.

The CSDDD is expected to complement the CSRD as it will require companies to implement comprehensive identification, prevention and mitigation processes to eliminate adverse human rights and environmental impacts in the company's own operations, its subsidiaries and value chains. It will also complement the Taxonomy Regulation that requires specific details of what constitute "environmentally sustainable" investments.

It is expected that the CSDDD will require companies in scope to ensure the identification, prevention, mitigation and ability to account for any adverse environmental impacts, with adequate governance, management systems and measures in place to this end.

For instance, regarding adverse climate change impacts, a company would have to obtain quantitative and qualitative information about baseline conditions at higher risk sites or facilities. Identification of adverse impacts would include assessing the environmental context in a dynamic way and at regular intervals, prior to a new activity or relationship; prior to major decisions or changes in the operation; in response to or anticipation of changes in the operating environment; and periodically (at least every 12 months) throughout the life of an activity or relationship. The following Climate Change Impact Assessment can serve as due diligence demonstrating partial compliance with the CSDDD.

9.3.3 National Legislation

Climate Action and Low Carbon Development Act

The Climate Action and Low Carbon Development Act 2015 (the principal act) set national climate policy on a statutory footing for the first time in Ireland, with the target of pursuing the transition to a low-carbon, climate-resilient, and environmentally sustainable economy by 2050. The principal act was subsequently amended by the Climate Action and Low Carbon Development (Amendment) Act 2021 (the '2021 Act') which sets Ireland on a legally binding path to net-Zero emissions no later than 2050, and to a 51% reduction in emissions by the end of this decade (Government of Ireland; 2015).

The 2021 Act provides a legally binding framework with clear targets and commitments set in law, and ensures the necessary structures and processes are embedded on a statutory basis to ensure Ireland achieves its national, EU and international climate goals and obligations in the near and long term. Policy amendments will involve the rapid electrification of transport system: electric bikes, electric vehicles, and electric public transport. This will be enacted in tandem with a ban on new registrations of petrol and diesel cars from 2030. Furthermore, there will be a policy to incentivise behavioural changes by increased effective modal shift to walking, cycling and public transport infrastructure.

The 2021 Climate Act incorporates carbon budgets and sectoral emissions limits, defining the carbon budget as the total allowable GHG emissions during the budget period. Consequently, the Act has removed any mention of a national mitigation plan, replacing it with references to both former and latest versions of the Climate Action Plan, as well as a series of National Long Term Climate Action Strategies. Additionally, it has updated the national transition objective to a national climate objective, committing "to pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy" (Government of Ireland; 2022).

Section 6B (12) of the 2021 Climate Act requires the Minister for the Environment, Climate and Communications to publish the approved carbon budget programme. In May 2022 the budgets were published and the total emissions allowed under each budget is set out below, as well as the average annual reduction for each 5-year period (DECC, 2022):

- 2021-2025: 295 Mt CO₂eq - this represents an average reduction in emissions of 4.8% per annum for the first budget period.
- 2026-2030: 200 Mt CO₂eq - this represents an average reduction in emissions of 8.3% per annum for the second budget period.
- 2031-2035: 151 Mt CO₂eq - this represents an average reduction in emissions of 3.5% per annum for the third provisional budget.

To meet these targets, the government published a set of Sectoral Emissions Ceilings in July 2022, and the transport sector has a 50% reduction target on the 2018 baseline (12 Mt CO₂eq) to achieve a ceiling of 6 Mt CO₂eq by 2025 and 6 Mt CO₂eq by 2030 (DECC, 2022).

The assessment in this chapter has been prepared in accordance with, among other things, the 2021 Act and the EIA Directive.

The 2021 Act also introduces a requirement for each local authority to prepare a Climate Action Plan, which will include both mitigation and adaptation measures and be updated every

five years. Local authority Development Plans will also align with their Climate Action Plan (DECC, 2021).

The proposed project is consistent with the following plans, strategies and objectives specified in section 15 of the Climate Action and Low Carbon Development Act 2015, as amended:

- The National Climate Objective;
- The most recent Climate Action Plan;
- The most recent National Long-Term Climate Action Strategy;
- The most recent National Adaptation Framework; and
- The objective of mitigating GHG emissions and adapting to the effects of climate change in the State.

The Act mandates the relevant Minister to develop the Climate Action Plan, the National Long-Term Climate Action Strategy, and the National Adaptation Framework to achieve the National Climate Objective (DECC, 2021). This objective of becoming 'climate neutral' by 2050 aligns with the EU's climate goal as established in Regulation (EU) No 2021/1119 (the 'European Climate Law'). The European Climate Law enshrines into EU legislation the target set by the European Green Deal for the EU to attain climate neutrality, or 'net zero' GHG emissions, by 2050.

The Climate Action Plan 2025 (CAP25) is the fourth annual update to Ireland's Climate Action 2019 (the plans are to be updated annually to ensure alignment with Ireland's legally binding economy-wide carbon budgets and sectoral ceilings) (DECC; 2023). This plan is the third to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings. The plan had a delayed launch on April 15th, 2025.

The plan implements the carbon budgets and sectoral emissions ceilings and sets out a roadmap for taking decisive action to halve our emissions by 2030 and reach net zero no later than 2050, as committed to in the Programme for Government. Climate Action Plan 2025 builds on Climate Action Plan 2024, outlining how Ireland will accelerate the actions required to respond to the climate crisis, putting climate solutions at the centre of Ireland's social and economic development (DECC; 2025). Climate Action Plan 2025 is a streamlined Climate Action Plan, to be read in conjunction with Climate Action Plan 2024. It is also the final Climate Action Plan of the first 5-year Carbon Budget – marking an important midpoint in what has been called the decade of climate action.

The supplementary Annex of Actions, approved by the Irish Government, provides the specific actions required to implement the targets set out in the Plan, and includes information regarding outputs, lead departments, timelines and stakeholders. For 2025 a similar approach to the 2024 Annex has been implemented that will see only new, high-impact actions included in the Annex, while the full roadmap of actions to support the delivery of our climate targets remains within the Climate Action Plan itself (DECC; 2025).

9.3.4 National Policy

National Adaptation Framework (NAF)

Ireland's first statutory National Adaptation Framework (NAF) was published on 19 January 2018 and was developed under the Climate Action and Low Carbon Development Act 2015.

The NAF sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts (DECC; 2018).

The NAF builds on the work already carried out under the National Climate Change Adaptation Framework (NCCAF, 2012). The NAF outlines a whole of government and society approach to climate adaptation in Ireland. It also aims to improve the enabling environment for adaptation through ongoing engagement with civil society, the private sector, and the research community.

Under the NAF, several government departments are required to prepare sectoral adaptation plans in relation to the priority areas that they are responsible for, which is to be reviewed once every five years. Local authorities are required to prepare local adaptation strategies. The NAF also aims to ensure ongoing engagement with civil society, the private sector, and the research community.

Just Transition

The 2021 Climate Action Plan sets out a just transition framework consisting of four principles to underpin both processes and implementation of all climate action policies and measures. Provisions under the 2021 CAP have been carried over to CAP25 without substantive changes. The present report primarily examines the impact of climate change (Government; 2021). However, we recommend that due consideration be given to the concept of a "just transition," aligning with the Irish Government's framework, to ensure a comprehensive approach to addressing the climate crisis that extends beyond mere climate action.

The just transition framework is made up of four principles (DECC; 2021):

- An integrated, structured, and evidence-based approach to identify and plan our response to just transition requirements.
- People are equipped with the right skills to be able to participate in and benefit from the future net zero economy.
- The costs are shared so that the impact is equitable and existing inequalities are not exacerbated.
- Social dialogue to ensure impacted citizens and communities are empowered and are core to the transition process.

Regional Policy

Action 8 of the National Adaptation Framework (DCCAE 2018) indicates that four regional Climate Action Regional Offices (CAROs) must be established, and the Atlantic Seaboard South CARO, hosted by Cork County Council, is one of these offices. One of the responsibilities of the CARO is to assist local authorities within their region in preparing a Climate Action Plan.

Cork County Council adopted its Climate Action Plan 2024–2029 in partnership with the Atlantic Seaboard South CARO. This plan was developed in line with the Local Authority Climate Action Plan Guidelines issued by the Department of Environment, Climate and Communications in 2023. The plan sets out how Cork County Council will reduce greenhouse gas emissions, improve energy efficiency, and build resilience to climate impacts across the county. It also outlines how the Council will work with communities, businesses, and stakeholders to deliver climate action locally, while aligning with national targets, including

a 51% reduction in greenhouse gas emissions by 2030 under the Climate Action and Low Carbon Development (Amendment) Act 2021.

9.3.5 Cork County Council Climate Action Plan 2024-2029

In February 2024, Cork County Council adopted the Cork County Council Climate Action Plan 2024–2029 (CCAP). This plan serves as the County’s integrated climate adaptation and mitigation strategy, setting out a pathway to achieve, by no later than 2050, a climate-resilient, biodiversity-rich, environmentally sustainable, and climate-neutral Cork. Aligned with the Government’s National Climate Objective and the *Climate Action Plan 2025*, the CCAP outlines actions across six thematic areas:

- Governance and Leadership
- Energy and the Built Environment
- Community Resilience and Transition
- Environment and Biodiversity
- Transport and Mobility
- Sustainability and Resource Management

The plan’s key goals include:

1. Achieving a 50% improvement in Cork County Council’s energy efficiency by 2030
2. Delivering a 51% reduction in Cork County Council’s greenhouse gas emissions by 2030
3. Building a climate-resilient region by reducing the impacts of future climate-related events
4. Empowering communities through education, engagement, and collaboration
5. Supporting socio-economic growth and a just transition aligned with decarbonisation

To deliver these objectives, Cork County Council will enhance climate resilience, improve energy efficiency, and reduce emissions across its own assets, services, and infrastructure. As part of the plan’s development, a Climate Change Risk Assessment (CCRA) was undertaken in line with *Technical Annex B* of the *Local Authorities Climate Action Planning Guidelines*. This qualitative assessment identifies and prioritises potential climate risks, considering both current and future hazards, and informs where adaptation measures are most needed.

9.3.6 Cork County Development Plan (CCDP) 2022-2028

The Cork County CCDP sets out the policy objectives and the overall strategy for the proper planning and sustainable development of the County over the plan period from 2022 to 2028.

The CCDP directly mentions Rathcool Aerodrome in section 2.2.10 and highlights the importance of the Aerodrome as a commercial asset in North Cork;

“The Rathcool Aerodrome, licensed since 1962 by the Irish Aviation Authority, represents a unique and important commercial asset in North Cork. Irish Community Air Ambulance provide a dedicated Helicopter Emergency Service from the Aerodrome and favourable consideration will be given to appropriate proposals which seek to sustain its current and expand future functions subject to all relevant / normal planning considerations and taking

account of its sensitive location relative to the Blackwater River.”

The Climate Action chapter (Chapter 17 of the CCDP) outlines detailed policy objectives for climate change mitigation, adaptation, and the transition to a low-carbon, climate-resilient county. The chapter addresses four key areas:

- Energy Efficiency in Buildings;
- Renewable Energy Development;
- Decarbonising Transport;
- Agriculture, Land Management, Forestry, and Urban Greening.

These issues have been identified as being of particular significance in helping to achieve sustainable planning outcomes which will ultimately help to deliver a low carbon and a climate resilient County. Planning already plays a role in each of the key areas identified in the Cork County CAP. Having regard to the headings set out in the Cork County CAP, the Development Plan contains a range of policy objectives which aim to mitigate and adapt to climate change.

The creation of a climate resilient County is an overarching strategic outcome of the Cork County CDP, and as such, the theme permeates the entire plan with a selection of policy objectives in multiple Chapters all contributing to aid in the transition of the County to a climate resilient low carbon society⁵. Relevant policy objectives and their incorporation into the Proposed Development design have been considered in Section 6 of this report.

The Cork County Climate Action Plan 2024-2029 aims to create a cleaner, greener, and more resilient county. The Climate Action Plan has 166 specific actions that have either been delivered, are in development stage or drafted for the future implementation. For instance, the CAP outlines the action to establish Decarbonising Zones (DZs) across Cork County to pilot community led climate initiatives and align with national targets for reducing greenhouse gas emissions by 51% by 2030. The first DZ has been established in Macroom, Co. Cork, this zone serves as a model for future decarbonising efforts across other parts of Cork County.

Rathcool Aerodrome is poised to play a meaningful role in supporting the Macroom DZ by pioneering sustainable aviation practices in rural County Cork. There is an initiative for the Rathcool Flying Club to convert aircrafts to Sustainable Aviation Fuel, this initiative is supported by Enterprise Ireland. The future integration of solar power and battery energy storage on-site will further reduce reliance on fossil fuels, while the club's openness to electrified light aircraft and hydrogen-powered alternatives aligns with national innovation in clean transport.

As aviation commits to achieving net zero emissions by 2050, Rathcool Aerodrome exemplifies how small-scale, community-driven infrastructure can contribute to broader decarbonisation goals, serving as a rural innovation hub that complements the Macroom DZ's ambition for low-carbon, resilient development.

Rathcool Flying Club Sustainability Strategy 2025 commits to reducing emissions through the adoption of Sustainable Aviation Fuel (SAF), solar energy with battery storage, and exploring electrified and hydrogen-powered aircraft, the club is also proactively addressing the potential impacts of climate change on the transport sector. Rathcool Flying Club aims to ensure

that mitigation measures are in place against increased flood risk, extreme weather events, and temperature variability, which are identified in the Strategic Flood Risk Assessment of the CCDP as growing threats to infrastructure across County Cork.

This local strategy aligns with regional policy objectives outlined in the Cork County Council Climate Action Plan 2024–2029. Rathcool Flying Club's efforts directly support the goals of the Macroom Decarbonising Zone, Cork's pilot area for low-carbon development, by demonstrating how rural transport infrastructure can transition to clean energy while enhancing resilience to climate hazards. The aerodrome's sustainability strategy complements Cork County Council's broader ambition to mainstream climate adaptation across all sectors, including transport, land use, and energy systems.

9.3.7 Guidance

The assessment has referred to national guidelines, where available, in addition to international standards and guidelines relating to the assessment of GHG emissions and associated climatic impact. These are summarised below:

- 2030 Climate and Energy Policy Framework (European Commission, 2014)
- 2030 EU Climate Target Plan (European Commission, 2021b)
- Assessing GHG Emissions and Evaluating their Significance the Institute of Sustainability & Environmental Professionals (ISEP formerly known as IEMA), (2022)
- Carbon Management in Infrastructure (European Commission, 2013)
- Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) (Government of Ireland, 2021)
- Climate Action Plan 2025 (Government of Ireland, 2025)
- Design Manual for Roads and Bridges (DMRB) Volume 11 Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 14 LA 114 Climate (UK Highways Agency, 2019)
- Department of Housing, Planning, and Local Government. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018)
- European Commission. Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013)
- European Commission. Technical Guidance on the Climate Proofing of Infrastructure in the Period 2021-2027 (2021a)
- IEMA. EIA Guide to: Climate Change Resilience and Adaptation (2020a)
- IEMA. GHG Management Hierarchy (2020b)
- IEMA. Environmental Impact Assessment Guide to: Assessing GHG Emissions and Evaluating their Significance (2022)
- Land Development Agency (LDA), and Environmental Protection Agency (EPA).
- Publicly Available Specification (PAS) 2080: 2016
- Transport Infrastructure Ireland (TII). GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document (2022c)
- Transport Infrastructure Ireland (TII). GE-GEN-01101: Guide to the Implementation of Sustainability for TII Projects (2023)

- Transport Infrastructure Ireland (TII). PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (2022a)
- Transport Infrastructure Ireland (TII). PE-ENV-01105: Climate Assessment Standard for Proposed National Roads (2022b)
- Integrating Climate Change into Strategic Environmental Assessment in Ireland – A Guidance Note (EPA, 2015)

9.4 Study Methodology

Carbon dioxide (CO₂) emissions have a global climate warming effect. This is regardless of rate of release, location or the weather when released into the atmosphere. This is unlike pollutants that affect local air quality where the rate of release, location and prevailing weather, as well as the amount of pollutant, determines the local concentrations and the impact.

Local ambient concentrations of CO₂ are not relevant for climate change and there are no limits or thresholds that can be applied to particular sources of carbon emissions. Any amount of CO₂ released into the atmosphere will contribute to climate warming, the extent of which is determined by the magnitude of the release. Although CO₂ emissions are typically expressed as kilogrammes or tonnes per year, there is a cumulative effect of these emissions because CO₂ emissions have a warming effect which lasts for 100 years or more.

In this regard, the methodology adopted in this chapter covers two separate assessments – a GHG assessment (GHGA) and a climate change risk assessment (CCRA).

- GHG Emissions Assessment (GHGA) – This evaluation estimates the GHG emissions generated by a project throughout its entire lifespan. It then compares these emissions against pertinent Irish carbon budgets, targets, and policies to help gauge their significance.; The Transport Infrastructure Ireland (TII) Carbon assessment tool has been used for this assessment and
- Climate Change Risk Assessment (CCRA) – This analysis examines how a changing climate could affect a project and its surrounding environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

Further details on the methodologies undertaken are presented in the following paragraphs.

9.5 Study Area

The Proposed Development comprises the construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing operations building and paramedic base building to the east of the site, and construction of a new operations and paramedic base building to the west of the site; and the demolition of an existing helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary wastewater treatment

system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, the upgrade of an existing entrance onto the L-5215-0 road, site landscaping and all other associated site development works.

Effects arising from the potential impacts on climate are considered to impact on a national to EU to global level and the study area for climate is the State for both the construction and operation phases. The proposed Project has been outlined in Chapter 3 Project Description and summarised below.

9.6 Survey Methodology

9.6.1 Desk Surveys

A desktop study involving various national and international documents on climate change and analysis of synoptic meteorological data from the nearest Met Eireann station (Cork Airport) was also carried out in order to compile this report. Attention has been focused on Ireland's obligations under the Paris Agreement in the context of the overall climatic impact of the presence and absence of the Proposed Development.

This analysis was undertaken by means of a desktop assessment based on available relevant guidance and information sources, and with reference to other chapters of this EIAR.

The following information sources have been consulted in relation to the assessment of climate aspects for the proposed Project:

- Key material, resource and cut/fill balance inputs from the description of the proposed Project presented in Project Description and Construction Strategy of this EIAR;
- Traffic figures from Traffic and Transportation;
- GHG assessment for pre-construction, construction and operational life stages;
- Site Specific Flood Risk Assessment;
- Estimates of likely waste volumes from the description of the proposed Project presented in Project Description, Construction Strategy, Land and Soils and Resource and Waste Management of this EIAR; and
- Environmental Protection Agency (EPA) GHG Emissions Inventories and Projections.

9.6.2 Climatics

Summary of the Approach

This DNV assessment was primarily based on the on-site climate risk projections generated CMIP5/CMIP6 climate model. The tool is typically used in combination with multiple Shared Socio-economic pathways/ Representative Concentration Pathways (SSPs/RCPs), which represent different future GHG concentration trajectories developed by the International Panel on Climate Change. The assessment was undertaken for two representative scenarios SSP1-2.6/RCP 4.5 and SSP5-8.5/RCP 8.5:

- SSP1-2.6/RCP 4.5 (transition from 2030) – this scenario leads to global warming exceeding 2 °C by 2100 but remaining below 3 °C. It is described as an intermediate scenario; and

- SSP5-8.5/RCP 8.5 (business as usual) – this scenario leads to global warming significantly exceeding 3 °C by 2100 and is generally taken as the basis for the worst-case climate change scenarios.

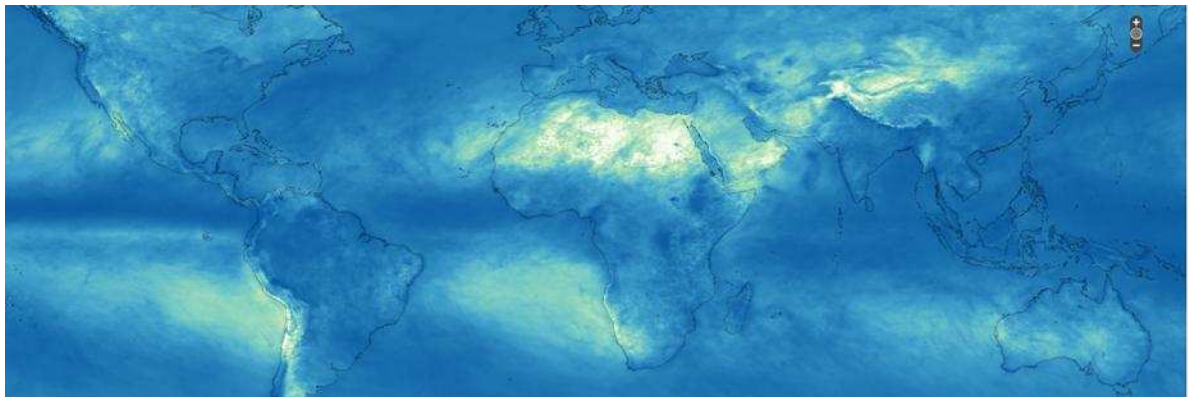


Figure 4 Multi-model Ensembled Rainfall Projection for 2050 (SSP5-8.5)

We combine the global data from multiple IPCC models (ACCESS, GFDL-ESM4, HadGEM) to address the model uncertainty. Figure 4 showcases the multi-model ensembled of rainfall projection for 2050 under SSP5-8.5 scenario. Through DNV's proprietary method, we downscale and refine the global data to a 5km grid resolution for various regions like Australia, Contiguous United States (CONUS), Europe, and the United Kingdom. Leveraging these refined datasets, we can assess multi-hazard risk exposure for assets and portfolios across different geographical areas.

Table 9-1 Assessment of climate risk indices

Category	Hazard
Temperature related indices	Surface temperature
	Warm Days
	Fire Weather Days
	Heat Stress Index
Rainfall related extremes	Precipitation
	Heavy Precipitation Days
	Extreme Precipitation Days
	Flood Events
Aridity/Drought conditions	Water stress
Irradiance at surface	Surface reading solar radiation
Cloud related	Cloud cover
Wind extremes	Wind speed
	Storm wind speed
Subsidence and landslide	Subsidence susceptibility index
	Landslide
Hailstorm	Hailstorm frequency
Lightning	Lightning density

9.6.3 Field Surveys

No site-specific baseline surveys were undertaken as part of the assessment for climate. The baseline data presented in this section is derived from the EPA Projections and Met Éireann monitoring network and may be taken as representative of the background climate within the Study Area.

9.6.4 Assessment Methodology

9.6.4.1 Key Parameters for Assessment

This assessment has been undertaken in line with the Institute of Sustainability & Environmental Professionals (ISEP formerly known as IEMA) guide 'Assessing GHG Emissions and Evaluating their Significance', 2nd Edition, 2022. The following aspects of the proposed Project are assessed in this chapter:

- Potential direct GHG (GHG) emissions associated with the construction of the proposed Project – this includes site clearance, embodied carbon, material transport, construction activities and waste management;
- Potential changes in GHG emissions associated with emissions during the operational phase of the proposed Project; and
- Vulnerability of both the construction and operational phases of the proposed Project to climate change.

9.6.4.2 GHG Appraisal Method -Construction Phase

(Including Material Delivery and Spoil Removal)

The GHG assessment accounts for various components relating to the project during different life stages to determine the total impact of the development on climate.

The GHG assessment for the Proposed Development is based on the methodology outlined in BS EN 17472:2022 – Sustainability Assessment of Civil Engineering Works, supported by the principles of PAS 2080:2016 – Carbon Management in Infrastructure. This combined approach enables a comprehensive evaluation of carbon emissions across the full lifecycle of the project, with an emphasis on early-stage decision-making, value chain collaboration, and the application of the carbon hierarchy: Avoid, Reduce, Substitute, Offset.

The assessment includes the following life cycle stages:

- **Product Stage:** The carbon emissions at this stage originate from the extraction of raw materials, their transportation to manufacturing sites, and the primary energy consumed (along with the associated carbon impacts) during the conversion of these raw materials into construction products. These phases have been included in the scope of this assessment, and relevant information has been integrated into the TII tool (TII, 2022).
- **Construction Stage:** These carbon impacts stem from the delivery of construction products to the site and their subsequent processing and assembly into the building. This aspect has been incorporated into the assessment's scope.
- **Operational Stage:** This includes greenhouse gas emissions associated with aircraft operations. Emissions from maintenance activities and equipment replacement have also been accounted for in this assessment.

- **End of Life Stage:** The sustainable deconstruction and disposal of the existing infrastructure at the end of its life (Approx 50 years) consider the activities carried out by demolition contractors on-site. However, no credit is given for potential future carbon benefits from reusing or recycling materials into new products. This stage is not included in the scope of this study due to the variability and uncertainty surrounding deconstruction methods that may be employed at the end of the development's lifespan.

Transport Infrastructure Ireland's (TII) proprietary carbon tool has been used to quantify carbon emissions from elements such as material delivery, spoil removal, roads, and infrastructure. The carbon tool is a spreadsheet-based product, developed by TII, with the goal of identifying, estimating and mitigating GHG emissions that accrue on large road and rail infrastructure projects. The carbon tool is closely aligned with guidance set out in PAS 20803 which suggests a modular structure for capturing and reporting carbon emissions according to lifecycle phase. Where the exact material needed isn't listed an estimate to a similar material type has been used. The construction waste and construction traffic information were reviewed from the traffic and waste chapters.

Design data for materials, earthworks and transport distances are based on input data from the design team. Where detailed designs are not available for various parts of the project, assumptions are made based on industry best practice and default values in the carbon tool. In particular, transport distances for materials have been estimated, as no specific suppliers have been selected at this early stage of the proposed Project. This allows for an estimate of transport emissions, using an emissions factor for kg CO₂eq/km in the carbon tool.

The building elements of the Proposed Development have not been considered in the assessment under the guidance of 'Assessing GHG Emissions and Evaluating their Significance', 2nd Edition, 2022, which states that "*Activities that do not significantly change the result of the assessment can be excluded where expected emissions are less than 1% of total emissions*". The construction of a new operations and paramedic base building is expected to be less than 1% of the total emissions.

In terms of reporting units, all units are in equivalent kilograms of carbon dioxide – hereafter kg CO₂eq. Equivalent kilograms of carbon dioxide (kg CO₂eq) are used as a standardised unit for numerous GHGs such as methane and nitrous oxide. Summary data is presented as tonnes of CO₂eq for ease of reference of this data.

9.6.4.3 GHG Appraisal Method - Operational Phase

Traffic Emissions

As per the EU guidance document Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013) the climate baseline is first established by reference to EPA data on annual GHG emissions (see Section 9.7 below). Thereafter the impact of the Proposed Development on climate is determined. Emissions from road traffic associated with the Proposed Development have the potential to emit carbon dioxide (CO₂) which will impact climate.

The UK Highways Agency has published an updated DMRB guidance document in relation to climate impact assessments LA 114 Climate (UK Highways Agency, 2019). The following scoping criteria are used to determine whether a detailed climate assessment is required for

a proposed project during the operational stage. During the operational phase, if any of the road links impacted by the Proposed Development meet the below criteria then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

None of the road links impacts by the Proposed Development satisfy the above criteria and a quantitative assessment of the impact of traffic emissions on climate is not necessary as there is no potential for significant impacts to climate.

Operational GHG Emissions

The EU guidance (2013) also states indirect GHG emissions as a result of a development must be considered, this includes emissions associated with energy usage. In addition to the EU guidance, the ISEP guidance note on 'Assessing GHG Emissions and Evaluating their Significance' (ISEP, 2022) states that "the crux of significance regarding impact on climate is not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050". Mitigation has taken a leading role within the guidance compared to the previous edition published in 2017. Early stakeholder engagement is key and therefore mitigation should be considered from the outset of the project and continue throughout the project's lifetime in order to maximise GHG emissions savings.

The estimated operational flight hours and the associated carbon emissions that are projected to occur as a result of the proposed development have been evaluated. These future emissions have been used to inform the operational phase of the climate assessment. Multiple measures have been included in the design to minimise potential impacts on climate where feasible. The Proposed Project includes support for the transition to Sustainable Aviation Fuel (SAF), which may result in up to a 90% reduction in CO₂ emissions, a 40% reduction in noise levels, and a 40% increase in range. The club's plan is for all aircraft to operate using either SAF or fully electric power between 2040 and 2050, with electric planes anticipated to become a more practical and cost-effective option within the next 5 to 10 years. Additionally, the club is considering the future opportunity of installing solar panels on the aircraft hangar roof to supply renewable energy to the site to further support the club's sustainability initiatives.

9.6.4.4 Assessment Criteria for GHG Emissions

After the publication of the 2021 Climate Amendment Act in July 2021 and the 2021 CAP, the carbon budgets were approved and a series of sectoral emissions ceiling were published, including sectoral emissions ceilings for the Transport Sector (DECC, 2021). These ceilings will allow a comparison with the net CO₂ projected GHG emissions from the Project.

The IEMA Climate Change principles (ISEP, 2020) document provides a section on how to assess GHG emissions in EIA and states:

- "When evaluating significance, all new GHG emissions contribute to a significant negative environmental effect; however, some projects will replace existing development that have higher GHG profiles. The significance of a project's emissions should therefore be based on its net impact, which may be positive or negative.

- “Where GHG emissions cannot be avoided, the EIA should aim to reduce the residual significance of a project’s emissions at all stages.”
- “Where GHG emissions remain significant but cannot be farther reduced... approaches to compensate the project’s remaining emissions should be considered.”

The process for determining the significance of effects involves two key steps: first, defining the magnitude of the impacts, and second, evaluating the sensitivity of the receptors (e.g., Ireland’s National GHG targets). Although there are no specific project criteria for climate assessment, the project will be evaluated using the recommended ISEP significance determination approach. This evaluation will account for any embedded or planned mitigation measures included in the project design (ISEP, 2020).

According to LA 114, professional judgment is essential when contextualizing and assessing the significance of a project’s GHG impact. In alignment with ISEP Guidance, LA 114 emphasises that the core of assessing significance is not just whether a project emits GHGs or the magnitude of these emissions alone, but rather whether the project helps reduce GHG emissions compared to a baseline that aligns with a net zero trajectory by 2050 (UK Highways Agency, 2019).

Significance determination for emissions generated by the project in this assessment is based on the criteria presented in Table 9-2 as guided by ISEP in addition to the following two factors:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland’s GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 9-2 Definition of Climate Significance

Magnitude of Impact	Description
Major or Moderate Adverse (i.e. significant)	A project that follows a ‘business-as-usual’ or ‘do minimum’ approach and is not compatible with the net zero trajectory by 2050 or sectoral based transition to next zero targets, results in a significant adverse effect. It is down to the consultant completing the assessment to differentiate between the ‘level’ of significant adverse effects, e.g. ‘moderate’ or ‘major’ adverse effects. A project’s impact can shift from significant adverse to non-significant effects by incorporating mitigation measures that substantially improve on business-as-usual and meet or exceed the science-based emissions trajectory of ongoing but declining emissions towards net zero. Meeting the minimum standards set through existing policy or regulation cannot necessarily be taken as evidence of avoiding a significant adverse effect. This is particularly true where policy lags behind the necessary levels of GHG emission reductions for a science based 1.5°C compatible trajectory towards net zero.
Minor Adverse (i.e. not significant)	A project that is compatible with the budgeted, science based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up-to-date policy and ‘good practice’ reduction measures to achieve an impact that has a minor adverse effect but is not significant.

	The project may have residual impacts but is doing enough to align with, and contribute to, the relevant transition scenario. A 'minor adverse' or 'negligible' non-significant effect conclusion does not necessarily refer to the magnitude of GHG emissions being carbon neutral (i.e. zero on balance) but refers to the likelihood of avoiding severe climate change and achieving net zero by 2050. A 'minor adverse' effect or better is a high bar and indicates exemplary performance where a project meets or exceeds measures to achieve net zero earlier than 2050.
Negligible	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory, and has minimal residual emissions, is assessed as having a negligible effect that is not significant.
Beneficial	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory, and has minimal residual emissions, is assessed as having a negligible effect that is not significant.

Ireland's carbon budgets provide a framework for understanding the significance of GHG emissions from the Proposed Development. This involves comparing the anticipated net GHG emissions of the development with the established carbon budgets. With the introduction of the Climate Action Act in 2021 and the Climate Action Plan 2025, sector-specific carbon budgets have been outlined for comparison with the development's net GHG emissions over its lifecycle. For the Transport sector, which emitted approximately 12 MtCO₂e in 2018, the budget has a 2030 cap of 6 MtCO₂e, reflecting a 50% reduction. Similarly, the Industry sector, with 2018 emissions of about 7 MtCO₂e, has a 2030 ceiling of 4 MtCO₂e, indicating a 35% reduction (see Table 9-4).

9.6.4.5 Climate Change Risk Assessment-Criteria for Climate Vulnerability

Climate change risk assessment is a risk assessment-based methodology for identifying potential climate impacts and assessing their severity. Carrying out a climate change risk assessment, at the simplest level, can be summarised into the following steps:

- identifying potential climate change risks to a scheme or project.
- assessing these risks (potentially prioritising to identify the most severe); and
- formulating mitigation actions to reduce the impact of the identified risks.

Any assessment of risk includes assessing the likelihood (or probability) and magnitude (or severity) of the impacts identified. This method is widespread within the climate change resilience assessments carried out by projects and cities to date.

The risk assessment assesses the likelihood and consequence of the impact occurring to each receptor, leading to the evaluation of the significance of the impact and the vulnerability of the Proposed Development to various climate hazards. The vulnerability is determined by

combining the sensitivity and the exposure of the Proposed Development to various climate hazards.

To evaluate the likelihood of climate risk, we have utilised the baseline environmental information provided in Section 9.2, future climate change models, and insights from other experts involved in the Proposed Development (e.g., hydrologists and traffic consultants).

Initially, a preliminary screening/vulnerability assessment Climate Change Risk Assessment (CCRA) focusing on the operational phase is performed, following the TII guidance PE-ENV-01104 (2022). This involves assessing the sensitivity of the development assets (i.e., receptors) and their exposure to climate change hazards. Each asset category within the Proposed Development must be assigned a level of sensitivity to climate hazards. PE-ENV-01104 outlines the asset categories and climate hazards that should be considered.

The specific asset categories will differ depending on the type of development and need to be determined on a case-by-case basis.

- **Asset Categories** Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.
- **Climate Hazards** Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High Sensitivity** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.
- **Medium Sensitivity** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.
- **Low Sensitivity** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis can be completed. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type for example: flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High Exposure** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium Exposure** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low Exposure** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability i.e. climate screening.

$$\text{Vulnerability} = \text{Sensitivity} \times \text{Exposure}$$

The vulnerability assessment takes any proposed mitigation into account. Table 9-3 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. Where residual medium or high vulnerabilities exist, the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

According to TII guidance and EU technical guidance, if all identified vulnerabilities are reasonably ranked as low, a detailed climate risk assessment may not be necessary i.e. it is screened out. In such cases, the impact of climate change on the development would be deemed insignificant.

However, if there are residual medium or high vulnerabilities, a more detailed climate change risk assessment may be required, along with the implementation of additional mitigation measures to address the risks. The TII guidance specifies that a construction phase Climate Change Risk Assessment (CCRA) is only required if a detailed CCRA is deemed necessary.

Table 9-3 Vulnerability Matrix

Sensitivity	Exposure		
	High (3)	Medium (2)	Low (1)
High (3)	9- High	6- High	3- Medium
Medium (2)	6- High	4- Medium	2- Low
Low (1)	3- Medium	2- Low	1- Low

The vulnerability conclusions for each impact are based on, and incorporate, confirmed design and mitigation measures. Where the assessment concludes that the impact remains high, the project team may need to identify additional adaptation/EIA mitigation measures.

The screening CCRA (vulnerability assessment), detailed in Section 9.10, did not identify any residual medium or high risks to the Proposed Development as a result of climate change. Therefore, a detailed CCRA for the construction and operational phase were scoped out.

While a CCRA for the construction phase was not required, best practice mitigation against climate hazards is still recommended in Section 9.11.

9.6.5 Consultation

Consultation with representatives of Cork County Council departments was carried out through pre-application engagement, including meetings to discuss technical design, environmental matters, and planning considerations.

Three pre-application meetings were held with Cork County Council, during which technical and environmental information was presented. These meetings informed the scope of the EIAR and the climate-related commitments of the project.

9.6.6 Difficulties Encountered / Limitations

Difficulties were encountered during the quantification of materials at the design stage in order to assess the embodied construction carbon. The exact volumes of materials, location of waste disposal sites, sourcing of products and technical specification for materials are finalised during the detailed design phase and by the appointed contractor. Throughout the

assessment, efforts have been made to provide the most likely scenario of the embodied carbon assessment. Where it is required to make assumptions as the basis of the assessment presented here, these assumptions are based on advice from competent project designers and are clearly outlined within the chapter.

9.7 Receiving Environment

Climate refers to the average weather conditions over a period of time, typically 30 years, while climate change denotes a substantial alteration in these average conditions. Although climate change can occur naturally, human activities in recent years have accelerated its pace through the emission of GHG (GHGs), as noted by the IPCC in 2015. These anthropogenic GHGs are changing the composition of the Earth's atmosphere, leading to an enhanced 'Greenhouse Effect.' This effect increases the atmosphere's capacity to trap heat, resulting in a rise in average global temperatures over the past four decades. The burning of fossil fuels, which releases significant amounts of carbon dioxide (CO₂), has been and remains a major contributor to this enhanced greenhouse effect. The most critical GHGs include carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O).

Global climate change refers to the long-term shift in temperature and weather patterns on Earth, primarily driven by human activities such as burning fossil fuels, deforestation, and industrial processes. These activities increase the concentration of greenhouse gases in the atmosphere, enhancing the greenhouse effect and leading to a rise in average global temperatures. This warming impacts natural systems, causing more frequent and severe weather events, melting polar ice, rising sea levels, and disruptions to ecosystems and biodiversity. The effects of climate change are profound, affecting agriculture, water resources, health, and the economy, necessitating urgent and sustained efforts to mitigate and adapt to these changes.

Ireland is also experiencing the impacts of a changing climate with the rise in the annual surface air temperature by 0.8% since 1900. In addition to temperature, we are seeing increased rainfall and sea-level rise and observing changes in the frequency of extreme weather like storms, flooding, and drought (EPA, 2023). Examples of extreme weather would be Storm Ophelia in 2017 and the Beast from the East in 2018 to name two of the most impactful.

9.7.1 Current Baseline

9.7.1.1 Existing GHG Emissions Baseline

In 2023, Ireland's GHG emissions are estimated to be 58.82 million tonnes carbon dioxide equivalent (Mt CO₂eq), which is 6.1% lower (or 3.79 Mt CO₂eq) than emissions in 2022 (62.26 Mt CO₂eq) and follows a 3.0% decrease in emissions reported for 2022. Emissions are 3.3% below the historical 1990 baseline for the first time in 33 years.

Climate impacts are evaluated at a national level, considering national targets and sectoral emission ceilings. The study area for climate assessments is the Republic of Ireland, with the baseline established in the context of this geographic focus.

In 2023 emissions in the stationary ETS1 emissions decreased (17%) and emissions under the ESR (Effort Sharing Regulation) decreased (3.4%). When LULUCF is included, total national emissions decreased by 3.8% (EPA, 2025).

Decreased emissions in 2023 compared to 2022 were observed in the largest sectors except for transport which showed an increase of 0.3% shown highlighted red in the "Emissions change 2022-2023" table 9-4 below (EPA, 2025). Climate impacts are evaluated at a national level, considering national targets and sectoral emission ceilings. The study area for climate assessments is the Republic of Ireland, with the baseline established in the context of this geographic focus. The table shows that Transport accounted for 0.3% of emissions

Table 9-4 Emissions change 2022-2023 Ireland.

Mt CO₂ eq	2022	2023	% Change
Agriculture	21.782	20.717	-4.9%
Transport	11.759	11.798	0.3%
Energy Industries	10.003	7.860	-21.4%
Residential	5.753	5.347	-7.1%
Manufacturing Combustion	4.356	4.152	-4.7%
Industrial Processes	2.294	2.155	-6.1%
F-Gases	0.719	0.675	-6.0%
Commercial Services	0.734	0.715	-2.6%
Public Services	0.690	0.671	-2.7%
Waste	0.870	0.844	-3.0%
LULUCF	3.655	3.895	6.5%
Total excluding LULUCF	58.960	54.934	-6.8%
Total including LULUCF	62.616	58.829	-6.0%

Emissions per capita decreased from 11.31 tonnes CO₂eq/person in 2022 to 10.34 tonnes CO₂eq/person in 2023. Ireland's average tonnes of GHG/capita over the last ten years were 12.08 tonnes. With CSO 2023 census data showing a population of 5.28 million people and with population projected to increase to 5.67 million in 2030, 6.05 million in 2040 and 6.33 million by 2050, per capita emissions need to reduce significantly. At current per capita emission levels, each addition 500,000 people would contribute an additional 5 million tonnes of CO₂eq annually.

The EPA also publishes GHG emission projections to 2055. Table 9-5 shows that in the WAM scenario the percentage reduction is not achieved for electricity, transport, industry, agriculture and other (comprises of waste, fluorinated-gases and petroleum refining). Looking at the overall percentage emissions reduction target of -51% by 2030 compared to 2018, the projections are indicating a significant shortfall with only a -29% reduction achieved thus predicting that Ireland will not achieve its legally binding climate target (EPA, 2024).

Table 9-5 Assessment of Achievement of Sectoral Percentage Targets under the With Additional Measures scenario (EPA)

Sector	Emissions 2018 (Mt CO₂eq)	Projected Emissions 2030 (Mt CO₂eq)	Percentage Change 2030 vs 2018	Target Reduction 2030 vs 2018	Percentage Change (Reported in 2024) 2030 v 2018
Electricity	10.2	3.1	-0.7	-75%	-0.66
Transport	12.3	9.7	-0.21	-50%	-0.29
Buildings (Residential)	7	5.4	-0.22	-40%	-0.4
Buildings (Commercial & Public)	1.5	1	-0.36	-45%	-0.6
Industry	7	6.1	-0.12	-35%	-0.24
Agriculture	21.4	18	-0.16	-25%	-0.18
Other	2.1	1.6	-0.25	-50%	-0.25
LULUCF* (no ceiling currently)	4	5.5	0.39	N/A	0.17
Total with LULUCF	65.6	50.6	-0.23	-51%	-0.29

*A direct comparison of emissions in the Agriculture sector against its Sectoral Emission Ceilings is no longer viable.

** Waste, F-gases and Petroleum Refining

***National objective includes LULUCF

9.7.2 Future GHG Baseline

In line with TII and ISEP Guidance the future baseline is a trajectory towards net zero by 2050, “whether it [the project] contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050” (ISEP, 2022). Formerly known as the Institute of Environmental Management and Assessment (ISEM), now rebranded as the Institute of Sustainability and Environmental Professionals (ISEP).

The future baseline for GHG emissions assessment will be considered in relation to the future Irish climate targets which the assessment results will be compared against.

The future baseline will be based on Ireland achieving the targets outlined in the Climate Action Plan 2025 (CAP25) and subsequent Climate Action Plans, as well as meeting binding EU targets for 2030. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted ‘*Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013*’ (hereafter referred to as the Regulation). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030 compared to 2005. The Regulation was amended in April 2023 and

Ireland must now limit its GHG emissions by at least 42% by 2030. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

9.7.3 Current CCRA Baseline

Impacts to the proposed Project as a result of climate change involve increases in temperatures and increases in the number of rainfall days per year. Ireland has observed increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed Project will be located. The EPA (2021) has compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed Project:

- Increase of 1 to 4 degrees Celsius in average temperature;
- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species

The proposed Project area experiences a temperate, maritime climate, resulting in mild winters and cool summers. The Met Éireann weather station at Cork Airport, County Cork, is the nearest weather and climate monitoring station to the proposed Project that has meteorological data recorded for the 30-year period from 1991 to 2020 (Met Éireann, 2023). The monitoring station is located approximately 44km southeast of the proposed Project. Meteorological data recorded at Cork Airport over the 30-year period from 1991 to 2020 indicates that the wettest months were January and December, and the driest month on average was May. July was the warmest month with a mean temperature of 18.6°C.

Met Éireann recent weather patterns were analysed, they highlight a marked rise in both the frequency and intensity of storms. Notable examples include Storm Darwin in February 2014, Storm Emma in March 2018, Storm Ophelia in October 2018 and Storm Éowyn in January 2025. During Storm Ophelia, the highest wind gust recorded at Roche's Point which is 17km from Cork Airport, was 155.6 km/h with a sustained 10-minute wind speed of 114.8 km/h.

Annual rainfall from 1981 to 2010 was 1% lower compared to the 30-year period from 1991 to 2020. As rainfall has increased in Ireland, recent years have seen more intense historical precipitation events, such as the heavy rainfall and flooding in the summer of 2008, severe flooding in November 2009, numerous flooding events during storm Babet (2023), particularly in the Cork and the heavy rainfall in the Greater Dublin Area on 24 October 2011. The latest data from Met Éireann's 'The Status of Irish Climate 2020 Report' highlights that the 10-year period from 2006-2015 was the wettest recorded decade (Met Éireann, 2021).

Met Éireann's 2024 Climate Statement states 2024's average shaded air temperature in Ireland is provisionally 10.72 °C, which is 1.17°C above the 1961-1990 long-term average. This makes 2024 the fourth warmest year on record, 0.49 °C cooler than 2023, the warmest year on record. The five warmest years on record are 2023, 2022, 2007, 2024 and 1945. Seven of the top ten warmest years have occurred since 2005. (Met Éireann, 2024).

In 2024, Ireland experienced below-average rainfall, including the warmest May on record. Since April 2023, record-high sea surface temperatures (SST) were observed, with a severe marine heatwave affecting the western coast of Ireland in June 2023. This marine heatwave contributed to the unprecedented rainfall in July 2023 (Met Éireann, 2024).

Recent weather patterns and extreme weather records from Met Éireann have been examined. Given the exceptional data from 2023 and 2024, Met Éireann notes that current Irish climate projections predict continued warming, including milder winters. The record temperatures increase the likelihood of extreme weather events, leading to longer dry periods and heavier rainfall. Additionally, sea level rise is expected to cause more storm surges and coastal flooding, with an increase in compound events where coastal surges and extreme rainfall occur simultaneously. While Met Éireann is confident that maximum rainfall rates will rise, there is less certainty about how the frequency or intensity of storms will change with climate change.

Surface air temperature plays a crucial role in climate analysis, influencing ecosystems, livelihoods, and human activities. Changes in temperature affect various sectors, including health, agriculture, and energy demand. In Ireland, over a century of consistent temperature measurements is available. Globally, the average surface air temperature has increased by 0.85°C over the past 100 years, with the rate of warming nearly doubling since 1975, reaching an equivalent of a 1.65°C rise per century. The five warmest years on record globally were 2015–2019, which is notable since temperature records began in the mid to late 1800s. Hotter, drier summers and milder, wetter winters are now more common in many parts of the world (Met Éireann 2020).

9.7.4 Future CCRA Baseline

The EPA-funded research project 'Ensemble of Regional Climate Model Projections for Ireland Report No. 159' (EPA 2015) forecasts significant reductions in mean annual, spring, and summer precipitation, with longer dry spells expected. By 2050, the most pronounced decreases are projected for summer, with reductions ranging from 0% to 13% under medium-to-low emission scenarios and 3% to 20% under high emission scenarios. In contrast, heavy precipitation during winter and autumn is expected to increase by up to 20%. Additionally, the number of extended dry periods during autumn and summer is anticipated to rise considerably by mid-century.

The report suggests that the total number of North Atlantic cyclones is expected to decrease by 10%, along with a reduction in average mean sea-level pressure of 1.5 hectopascals (hPa) across all seasons by mid-century. Wind energy is anticipated to decline in spring, summer, and autumn, with an increase expected in winter. Additionally, the predicted rise in extreme storm activity could negatively impact future wind energy supply.

The EPA's State of the Irish Environment Report (Chapter 4: Climate Change) further highlights that projections indicate that the comprehensive implementation of additional policies and measures from the 2019 Climate Action Plan could reduce Ireland's total GHG emissions by up to 25 percent by 2030 compared to 2020 levels. Climate change is already a current issue in Ireland, with a temperature increase of approximately 0.8°C since 1900. The report further highlights the importance of strong public sector climate leadership and the rapid acceleration of decarbonisation efforts if we are to halt the climate crisis (EPA, 2024).

Accurate climate projections are a key scientific input for national policymakers when planning for, and adapting to, the challenges posed by climate change. Climate projections are produced using climate models, which have been developed by scientists over recent decades and are capable of simulating Earth's past, present, and future climate. Global Climate Models (GCMs) are used to model the global impacts on Earth's climate of increasing GHG concentrations in the atmosphere at a resolution of ~50km or coarser. Regional Climate Models (RCMs) are used to capture key small-scale atmospheric features on the scale of 1-10km, such as local convection and wind gusts. Multi-model ensembles are often used in climate prediction studies to quantify associated model uncertainty.

RCMs utilise the output of GCMs and model regional climates at higher spatial resolutions; this process is known as dynamic downscaling. This approach allows key climate variables to be modelled more precisely, including precipitation; near-surface temperature; and the number and intensity of low-pressure systems. Low pressure systems are the primary driver of precipitation and wind affecting the country; therefore, the added value of RCMs in the modelling of low-pressure systems is of particular importance for Ireland.

Concentration trajectories known as Representative Concentration Pathways (RCPs) were utilised in EPA Research Report No.339 High resolution Climate Projections for Ireland – A Multi-model Ensemble Approach (EPA 2020). For the EPA study, two RCPs were chosen, RCP4.5 and RCP8.5. RCP4.5 is considered an intermediate scenario, while RCP8.5 is considered to be representative of a potential worst-case scenario. This is the only available climate projection data for Ireland which has been developed for policy makers, and is steered by DECC, the EPA, Met Éireann, and the LA CAROs.

The future climate was modelled using both the Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. The study suggests that by mid-century (2041–2060), average annual temperatures are projected to rise by 1–1.2°C under RCP4.5 and 1.3–1.6°C under RCP8.5, with the most significant increases in the east. Temperature extremes are expected to become more pronounced, with summer daytime and winter night-time temperatures increasing by 1–2.4°C. The number of frost and ice days is projected to decrease by approximately 50%. Summer heatwaves are likely to become more frequent, especially in the south. Additionally, precipitation is expected to become more variable, with a significant increase in both dry periods and heavy rainfall events.

Established in June 2022, the National Framework for Climate Services (NFCS) aims to streamline the provision of climate services in Ireland and will be led by Met Éireann. The NFCS is designed to facilitate the co-production, delivery, and utilization of precise, actionable, and accessible climate information and tools to enhance climate resilience planning and decision-making. In parallel with the NFCS, ongoing research is being conducted through the TRANSLATE project. This initiative, led by climate researchers from the University of Galway's Irish Centre for High End Computing (ICHEC) and University College Cork's SFI Research Centre for Energy, Climate, and Marine (MaREI), with support from Met Éireann climatologists, is focused on advancing climate science. TRANSLATE generates outputs using internationally reviewed models from CORDEX and CMIP5, with Representative Concentration Pathways (RCPs) offering a range of possible futures based on different human activity scenarios.

TRANSLATE offers the first standardised and bias-corrected national climate projections for Ireland, designed to support climate risk decision-making across various sectors, such as

transport, energy, and water. The bias correction means that users can use the data directly (which is not always possible).

It provides insights into potential changes in Ireland's climate under global temperature increases of 1.5°C, 2°C, 2.5°C, 3°C, or 4°Cs. These projections generally align with previous forecasts for Ireland. The country's climate is heavily influenced by the Atlantic Meridional Overturning Circulation (AMOC), a major system of ocean currents, including the Gulf Stream, which features a northward flow of warm water and a southward flow of cold water. This system prevents Ireland from experiencing the extreme temperatures seen in other countries at similar latitudes. Recent studies suggest that the AMOC may weaken by 30–40% by 2100, leading to cooler North Atlantic Sea Surface Temperatures (SSTs). Despite this, Ireland is expected to continue warming, though the cooling effect of the AMOC might moderate the warming relative to continental Europe. Additionally, a weakened AMOC is anticipated to contribute to further sea level rise around Ireland. Climate change will cause significant shifts in temperature and rainfall patterns: average summer temperatures could rise by more than 2°C, summer rainfall could decrease by 9%, and winter rainfall could increase by 24%. Future projections also include a tenfold rise in the frequency of summer nights with temperatures exceeding 15°C by the end of the century, a decrease in the frequency of cold winter nights, and an increase in heatwaves. In Ireland, a heatwave is defined as a period of five consecutive days with daily maximum temperatures above 25°C.

9.7.5 Evolution of the environment in the absence of the project

Annex IV of the EIA Directive sets out the information required to be included in an EIAR. This includes:

“a description of the relevant aspects of the current state of the environment (baseline scenario) and an outline of the likely evolution thereof without implementation of the Proposed 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”.

In the event that the proposed Project does not proceed, an assessment of the future baseline conditions has been carried out and is described within this section. In the “do-nothing” scenario the interventions for the modernisation and construction will not occur. The predicted GHG emissions associated with the proposed Project will not occur as well as any potential GHG reductions and increased local benefits such as upgrades to the Aerodrome which will enhance the efficiency, safety, and availability of the HSE air ambulance service, ensuring better emergency response capabilities for the southern part of Ireland.

There is potential for indirect positive impact to climate from the proposed Project. The Proposed Project supports the transition to Sustainable Aviation Fuel (SAF), which offers a 90% reduction in CO₂ emissions, a 40% reduction in noise, and a 40% increase in range, thereby significantly lowering the carbon footprint of the club's operations. Additionally, the club aims to have all planes using either SAF or fully electric power by 2040 to 2050, with electric planes expected to become more viable and economical over the next 15 to 20 years. In addition, the flying club is considering the future installation of solar panels on the aircraft hangar roof, which would provide clean power for the site and further support the club's sustainability efforts through the use of renewable energy sources. These initiatives demonstrate a strong commitment to reducing the environmental impact of the club's activities and promoting sustainable aviation practices.

9.8 Climatics Multi-Climate Hazard Analysis for (53.3848, -6.5734)

Under each scenario, nine categories of climate risk indices (20+ hazards) were assessed. The findings and recommendations are summarised in the following table. For the key indices, both the chronic risk (average trend) and acute risk (extremes) are provided. For example, the change in mean temperature and fire weather days are introduced in the temperature-related indices, as temperature is considered as the most relevant impact factor for climate change on asset resilience.

Table 9-6 Assessment of climate risk indices

Category	Hazard	Summary	Exposure Level
Cloud Related	Cloud Cover	Historic average cloud cover in the area was 78.59%. This is projected to decrease to 78.23% (-0.36%) under SSP1-2.6 and 77.46% (-1.13%) under SSP5-8.5 for 2050.	5
Drought And Floods	Flood Events	The historic inundation of 100-yr flood event is 0.00 m. This is projected to 0.00 m (0%) under SSP1-2.6 and 0.00 m (0%) under SSP5-8.5 for 2050.	1
	Water Stress	The water stress index ranges from 1 to 5, with 1 indicating low stress and 5 indicating high stress. The historic water stress is rated as 0.01. And this is projected to increase to 1.00 under SSP1-2.6 and 1.00 under SSP5-8.5 for 2050.	1
Hailstorm	Hailstorm Frequency	Historical hailstorms in this location were 0.00 events/year.	n/a
Heat Stress	Heat Stress Index	The historic heat stress index in the area is 12.56. And this is projected to increase to 13.70 under SSP1-2.6 and 14.19 under SSP5-8.5 scenarios for 2050.	2
Irridiance At Surface	Surface Reaching Solar Radiation	The surface reaching solar radiation in the area was historically 123.56 W/m ² and this is projected to increase to 129.21 W/m ² under SSP1-2.6 and 127.13 W/m ² under SSP5-8.5 for 2050.	2
Lightning	Lightning Density	The historic lightning density in the area was 0.03 event/1000km ² /year.	n/a
Rainfall Related	Annual Max. 1-Day Precipitation	Historic annual maximum 1-day precipitation in the area was 38.55 mm. This is projected to increase to 39.50 mm under SSP1-2.6 and 39.75 mm under SSP5-8.5 for 2050.	5
	Annual Max. 5-Day Precipitation	Historic annual maximum 5-day precipitation in the area was 73.45 mm. This is projected to increase to 77.75 mm under SSP1-2.6 and 78.03 mm under SSP5-8.5 for 2050.	5
	Extreme Precipitation	Precipitation over 99% quantile is defined as extreme precipitation. The historic average extreme precipitation is 70.19 mm for a year and this is	5

		projected to increase to 88.14 mm (+25.58%) under SSP1-2.6 and 93.86 mm (+33.71%) under SSP5-8.5 for 2050.	
	Heavy Precipitation Days	Precipitation over 10mm is defined as heavy precipitation. The historic average heavy precipitation days in the area was 32.99 days in a year. This is projected to increase to 33.42 days under SSP1-2.6 and 34.67 days under SSP5-8.5 for 2050.	5
	Average Annual Precipitation	Historic average precipitation in the area was 1180.89 mm/year. This is projected to decrease to 1167.42 mm/year under SSP1-2.6 and 1181.25 mm/year under SSP5-8.5 for 2050.	5
Subsidence And Landslide	Landslides	The historic landslide in the area is 0.00.	n/a
	Subsidence Susceptibility Index	Subsidence susceptibility index ranges from 1-6, as very low, low, medium low, medium high, high, very high. The historic subsidence susceptibility index in the area is 2.00 and is projected to be 0.00 for 2040.	n/a
Temperature Related	Cold Days	The historic cold days in the area were 8.02% per year. This is predicted to decrease to 3.68% under SSP1-2.6 and 2.06% under SSP5-8.5 for 2050.	3
	Days >35°C	The historic days above 35°C in the area were 0.00 days per year. This is predicted to decrease to 0.00 days under SSP1-2.6 and 0.00 days under SSP5-8.5 for 2050.	1
	Days >40°C	The historic days above 40°C in the area were 0.00 days per year. This is predicted to 0.00 days under SSP1-2.6 and 0.00 days under SSP5-8.5 for 2050.	1
	Fire Weather Days	The historic fire weather days in the area were 20.33 days per year. This is predicted to increase to 26.31 (+29.40%) days under SSP1-2.6 and 30.83 (+51.62%) days under SSP5-8.5 for 2050.	1
	Mean Temperature	The historic mean annual temperature in the area is 10.35°C. This is projected to increase to 11.25°C (+0.90°C) under SSP1-2.6 (optimistic) and 11.70°C (+1.35°C) under SSP5-8.5 (business as usual or pessimistic scenario) for 2050.	3
	Warm Days	Warm days are defined as when the maximum temperature is beyond 90% percentile. The historic warm days in the area are 13.80% per year and this is projected to increase to 29.83% under SSP1-2.6 and 35.05% under SSP5-8.5 scenarios for 2050.	4
Wind Related	Storm Wind Speed	The historic storm wind speed of the area is 16.40 m/s and this is predicted to increase to 18.40 m/s (+12.22%) for SSP5-8.5 scenario for 2050.	5

	Wind Speed	The historic average wind speed in the area was 5.52 m/s. This is projected to be 5.30 m/s under SSP1-2.6 and 5.37 m/s under SSP5-8.5 for 2050.	5

9.9 Characteristics of the Proposed Development

Rathcool Flying Club intends to apply for permission for hard surfaced runway (740m in length), and taxiway with associated ground level lighting, associated interceptors, along with the relocation of an existing hanger, paramedic prefabricated base, crew prefabricated bases, helipad and all associated works at lands in Rathcool Aerodrome. The development will be delivered over 1 no. application which is the focus of this EIAR. Impacts to climate will occur during both the construction and operational phases of the developments.

During the construction stage the main source of climate impacts will be as a result GHG emissions and embodied carbon associated with construction materials and construction activities.

During the operational phase emissions from aircraft taking off and landing, vehicle emissions from traffic accessing the site and energy use for space heating, hot water, lighting and electrical devices have the potential to release carbon dioxide (CO₂) and other GHGs which will impact climate.

In addition, the vulnerability of the Proposed Development in relation to future climate change must be considered during the operational phase. The impact of the application in addition to the cumulative impacts of the application has been considered as part of this assessment.

9.10 Potential Impact of the Proposed Development

During both the construction and operational phases of the development, there is potential for various greenhouse gas emissions to be released into the atmosphere. According to TII guidance, the significance of these GHG emissions on the climate is evaluated based on the total emissions across all stages of the Proposed Development.

9.10.1 Construction Phase GHG Assessment

The TII Carbon toolkit was utilised to quantify the construction phase embedded carbon for the Proposed Development. This toolkit can quantify carbon in projects using Ireland-specific emission factors and data. Detailed project information including tonnage of materials was obtained from the Engineering Design Team.

GHG emissions have been quantified at all aspects of the construction phase including the following stages:

- Production stage: Embodied carbon is the carbon contained within a material or product. It is the sum of all carbon emissions that have been generated during the extraction, processing, and manufacturing of a particular product. Mitigation will be required as part of the demolition works to reduce the embodied carbon impact. Where possible demolished materials should be re-used on site or sent to a suitably licenced waste facility for re-use on other sites. Brickwork, concrete, steel and glazing are materials which have the potential for very high embodied carbon but also have to

potential for recovery or recycling. Specific items have been identified within the Construction Environmental Management Plan (CEMP). The Plan details the process in which materials will be salvaged and re-used on site or if they are suitable for salvage and re-use off site by providing them to a salvage merchant. Section 8.11 of the CEMP details the mitigation measures required for handling waste during the demolition phase of the development.

- Transportation to site: emissions associated with the carbon miles of the project materials. The impact of transporting materials from factory/source to site to facilitate construction is reported separately. A series of assumptions are made about the variables that impact transport emissions (material density, vehicle type, vehicle capacity and distance travelled) and assuming that the material may be transported from sources locally within 50km, regionally within 100km and nationally within 250km;
- Site Operations/Construction activities:
 - Site clearance emissions associated with plant and machinery required to clear the site. The carbon tool has a range of assigned land use categories for estimating site clearance. Different land use types have higher or lower carbon intensity for site clearance, which is linked to the energy required to clear the site.
 - Emissions arising from excavation activities based on the energy used in excavation activities. Energy expenditure varies depending on the type of ground to be excavated, e.g., rock excavation is much more energy intensive than topsoil excavation;
 - Construction activities covers carbon emissions generated during the construction of the proposed Project based on the scale and duration of the project; and
 - The generation of waste during the construction phase has potential for climate impact and the nature and scale of this impact depends on the type and volume of waste generated coupled with the nature of the waste treatment (reuse, recycling, recovery or disposal).
- Material replacement & refurbishment: Ongoing material refurbishment and replacement throughout the lifetime of the development is included within this stage of the GHG assessment these are default values based on the typical maintenance requirements for the chosen material types over the assumed 50-year lifetime

The results of the assessment of the above stages using TII tool is presented in Table 9-7 and Figure 5. The results indicate that the total GHG emissions generated as a result of the construction of the proposed Project are 1,930,000 kg of CO₂eq (1930 tonnes CO₂eq). The average material types from the TII Carbon Tool were utilised for this assessment due to the lack of more specific information.

As anticipated construction materials represent the largest portion of carbon emissions for the Proposed Development, constituting about 99% of the total embodied carbon emissions during the construction phase. The highest carbon impact is observed in the external walls, beams, floors, and roofs, based on the standard default values and assumptions used in the carbon calculations. The rest of the construction phase's embodied carbon emissions come from transportation to the site, site operations, and material replacement.

The total embodied carbon for the construction phase, including the maintenance and replacement of materials throughout the development's lifetime, has been calculated at 1930

tonnes CO₂e (see Table 9-7). Since the overall GHG emissions from the development cannot be directly compared to a single sector's 2030 carbon budget, the emissions are categorised into different assessment areas. These categories must be individually compared to the relevant sectoral emissions budgets, as outlined in Table 9-7. For the Proposed Development, the applicable sectoral emissions budgets include those for Industry Buildings (Residential), Transport, and Waste. The projected emissions for the development are annualised over an assumed 50-year lifespan and then compared to the relevant sector's 2030 carbon budgets. This annualization process facilitates a proper comparison with annual GHG targets.

Table 9-7 Construction Phase Greenhouse Gas Emissions

Stage	GHG Assessment Category	Predicted GHG Emissions (tCO ₂ e)	Relevant Sector for Carbon Budget Comparison	Annualised GHG Emissions as % of Relevant Carbon Budget
Production Stage	Materials	1,614	Industry	0.000807%
Transportation to site	Material Transport	48	Transport	0.000016%
Site Operations/ Construction activities	Clearance and demolition	38	Industry	0.000019%
Site Operations/ Construction activities	Excavation	9	Industry	0.000004%
Site Operations/ Construction activities	Construction Worker Travel to Site	6	Transport	0.000002%
Site Operations/Construction activities	Construction Waste Disposal & Transport	15	Waste	0.000030%
Site Operations/ Construction activities	Construction Fuel Usage	183	Transport	0.000061%
Material replacement & refurbishment	Maintenance Material	17	Industry	0.000008%
Total		1930 tCO ₂ e		

Note 1 Project lifespan assumed 50 years for calculation purposes in line with best practice

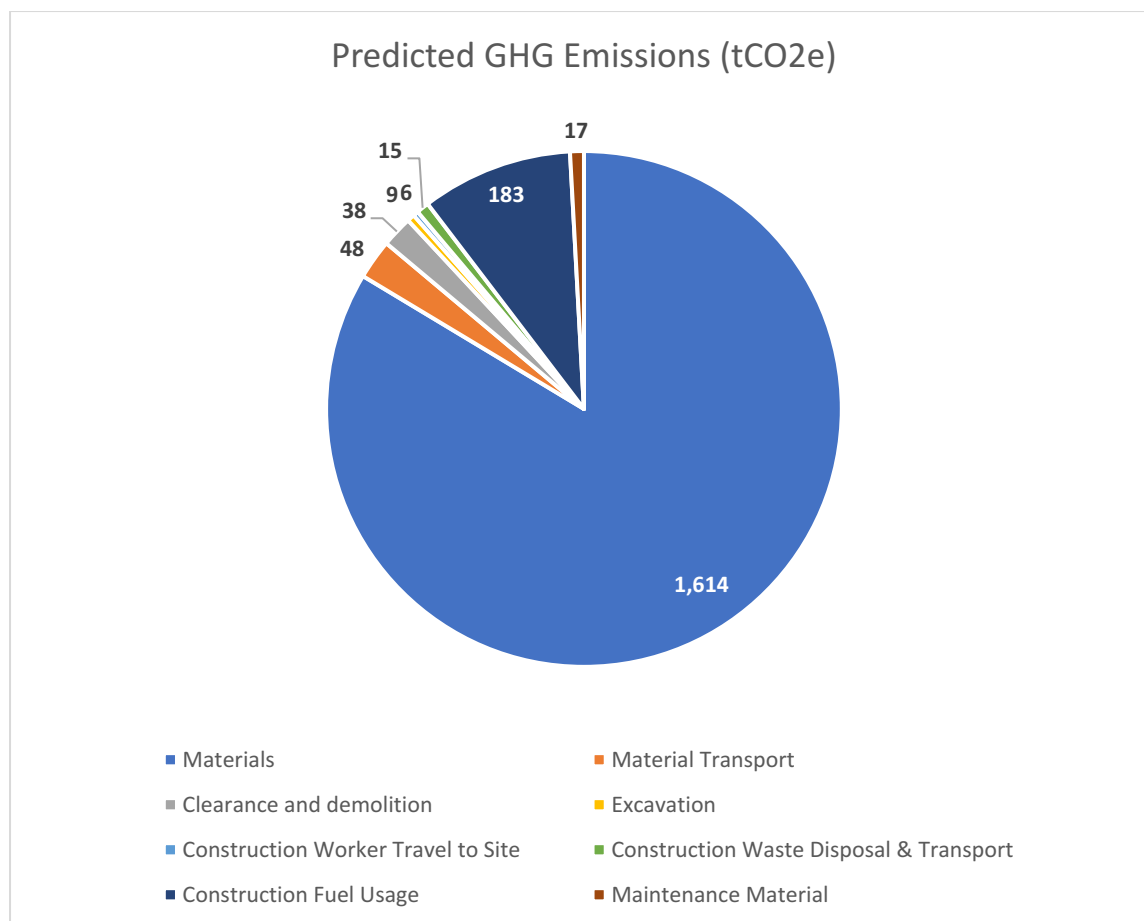


Figure 5 Construction Categories Greenhouse Gas Emissions tCO₂e

The projected GHG emissions (outlined in Table 9-7) can be averaged across the entire lifespan of the Proposed Development to provide annual emissions estimates, facilitating direct comparison with national annual emissions and targets.

Table 9-7 compares these GHG emissions with the 2030 carbon budgets for the transport, industry, and waste sectors, Ireland's total GHG emissions for 2023, and Ireland's EU 2030 target of a 30% reduction in non-ETS sector emissions from 2005 levels (33 Mt CO₂e) as specified in Regulation EU 2018/842.

When annualised over the Proposed Development's 50-year lifespan, the estimated total GHG emissions amount to 0.0001% of Ireland's total GHG emissions in 2023 and 0.0001% of Ireland's non-ETS 2030 emissions target. Specifically, emissions from transport-related activities account for 0.0006% of the 2030 Transport budget, and industry-related emissions comprise 0.0010% of the 2030 Industry budget.

Table 9-8 Estimated Construction GHG Emissions relative to Sectoral Budgets and GHG Baseline

Target/Sectoral Budget (tCO ₂ e)		Sector Annualised Proposed Development GHG Emissions are Compared	Annualised Proposed Development GHG Emissions as % of Relevant Target/Budget
Ireland's 2023 Total GHG Emissions (existing baseline)	58,829,000	Total GHG Emissions	0.0001%
Non-ETS 2030 Target	33,381,312	Total GHG Emissions	0.0001%
(Industry Sector) 2030 Sectoral Budget	4,000,000	Total Industry Emissions	0.0010%
2030 Sectoral Budget (Waste Sector)	1,000,000	Total Waste Emissions	0.0039%
(Transport Sector) 2030 Sectoral Budget	6,000,000	Total Transport Emissions	0.0006%

During the construction phase of the proposed development, several measures will be implemented to reduce the environmental impact and embodied carbon emissions. The Proposed Development will use environmentally friendly materials, including biodegradable lubricants and hydraulic fluids for machinery and equipment. This approach helps in minimising the environmental footprint of the construction activities. Additionally, best practices in bulk-liquid concrete management will be followed, such as secure shuttering/formwork and adequate curing times. Excess concrete will be contained and removed to a designated area on-site until it sets, after which it will be taken to an approved facility. These measures demonstrate a commitment to reducing emissions during the construction phase.

9.10.1.1 Impact of Climate Change on the Proposed Construction Phase

According to the 'LA 114 (2019) – Climate' guidance, which has been successfully implemented in the UK and referenced by the EPA here in Ireland, a qualitative assessment of disruption risk should be reported for the construction phase. The guidance suggests that changes to long-term seasonal averages due to climate change are not anticipated to be significant by the construction year, as predictions are typically cantered around mid-century. However, flooding during construction remains a possibility, and the areas at risk of flooding are detailed in Chapter 7 Hydrology. Flood risk measures and extreme weather considerations have been integrated into the construction planning process.

The Rathcool Aerodrome site is located within Flood Zones 'A' and 'B' for fluvial flood risk, as delineated by the OPW National Indicative Fluvial Mapping (NIFM) and confirmed by the Cork County Development Plan 2022–2028 Strategic Flood Risk Assessment. The primary flood risk arises from extreme fluvial events associated with the adjacent River Blackwater, with

secondary risks linked to the Rathcool River and a drainage channel traversing the site. Historical records and flood mapping indicate that a significant portion of the site is susceptible to flooding during both 1-in-100-year and 1-in-1000-year events, and this risk is expected to persist or increase under future climate change scenarios. In response, the proposed development has been carefully designed to avoid any significant infilling or ground level raising, with the runway and taxiway constructed at existing ground levels to preserve natural overland flow paths. Surface water runoff from new hardstanding areas will be managed and attenuated on site via an underground infiltration system, thereby mimicking greenfield conditions and ensuring no increase in fluvial or pluvial flood risk elsewhere. The drainage strategy also includes the extension and upgrading of existing culverts to maintain hydraulic connectivity and reduce the risk of waterlogging or localised flooding. These measures, together with recommendations for flood-proofing drainage covers and electrical infrastructure, ensure that the development is robust against current and future flood risks, supporting the site's resilience to climate-driven hydrological extremes and aligning with best practice in flood risk management.

Mitigation measures are outlined in Section 7.6.1 of Chapter 7 Hydrology to manage flood risk impacts during the construction stage, affecting the rail line, construction zones, and nearby properties. With these measures implemented, the risk of climate change impacts, particularly flooding, during the construction phase of the proposed project is not deemed significant.

9.10.2 Operational Phase

9.10.2.1 Operational Traffic and Flight Impacts

The Proposed Development at Rathcool Aerodrome is expected to have minimal road traffic impacts. The Rathcool Flying Club, which currently has 43 members, anticipates an increase in membership to between 50 and 60 members by 2029. However, this increase is not expected to significantly affect the number of cars accessing the site, as there are no plans to increase the number of planes owned by the club. On a busy club day, a maximum of nine cars could be expected to be parked within the boundaries of the site. The hours of access by members are predominantly outside peak commuting times, i.e., evenings and weekends.

The Air Ambulance Service, which operates from the site, has an average of seven cars on-site daily related to staff. The proposed development will not result in any increase in car traffic associated with the air ambulance service.

Overall, the road traffic generated by the flying club and the air ambulance service is light and varies depending on the season and nature of activities on the site. The proposed development is unlikely to cause any significant impacts on climate from road traffic emissions.

The extension of the runway at Rathcool Flying Club is projected to increase annual flight movements, primarily due to anticipated growth in club membership and enhanced operational capacity. The current recorded movements at Rathcool Aerodrome have averaged approximately 2,500 movements per annum over the past 3 years. Average flight movement figures per month over the past three years are presented in Table 9-9.

It is expected that the use of the Aerodrome by Rathcool Flying Club will increase by approximately 1,940 flight movements per annum by 2029. Projected flight movement figures for 2029, following the upgrade of the aerodrome are presented in Table 9-10. The club will continue to operate for the purpose of aviation leisure and recreation.

The number of proposed flight hours based on future movements following during the operational phase of the Proposed Development were utilised to estimate carbon emissions over a 50-year lifecycle. Estimated operational flight emissions are presented in Table 9-11.

Table 9-9 Average flight movements per months over the past 3 years

Historic Flight Movements	Average flight movements per months over the past 3 years												
	J	F	M	A	M	J	J	A	S	O	N	D	Total
Flying Club Movements	187	117	158	236	198	184	162	248	170	114	66	70	1,910
Air Ambulance Movements	44	45	71	58	56	64	65	64	42	46	32	36	623
Total Average Movements	231	162	229	294	254	248	227	312	212	160	98	106	2,533

Table 9-10 Projected flight movements following upgrade +5 years from commencement

Projected flight movements at 2029	Projected Movements per month following upgrade +5years from commencement												
	J	F	M	A	M	J	J	A	S	O	N	D	Total
Flying Club Movements	308	308	308	423	346	346	308	385	346	308	231	231	3848
Air Ambulance Movements	47	46	74	59	58	67	67	66	45	50	35	37	651
Total Movements	355	354	382	482	404	413	375	451	391	358	266	268	4499

The HSE Helimed Air Ambulance EC135 is owned and operated by the HSE and is based at Rathcool for emergency medical operations; the club does not operate this aircraft. The HSE Air Ambulance Service is expected to have a slight increase in flight movements from the proposed upgrades, particularly the installation of ground-level lighting which will enable the service to land after dark and therefore be available for call out at the start of service the next morning. Table 9-9 and 9-10 also outline the air ambulances average flight movements over the past three years and the projected flight movements for 2029.

Rathcool Flying Club owns and operates two Cessna 172 aircraft, which are the only club-owned planes based at the aerodrome. All other aircraft listed in Table 9-11 below (Diamond DA40, Light Sport aircraft, Microlight, and home-built models) are visiting aircraft, not owned or operated by the club or the HSE. These aircraft will remain within the Rathcool zone for approximately five minutes per visit. Pilots may choose to stop at Rathcool before continuing their journey to take a break, supporting health and safety protocols and helping to prevent pilot fatigue.

The proposed runway extension will not increase the number of club or HSE aircraft but will allow more frequent flights by club members and visitors while also improving operational flexibility and safety for the HSE Air Ambulance.

Projected annual operational flight hours for each aircraft type and associated carbon emissions are detailed in Table 9-11 below. Over a 50-year lifecycle, the adoption of Sustainable Aviation Fuel (SAF) is expected to deliver an 80% reduction in CO₂ emissions compared to conventional fuels, significantly mitigating the climate impact of increased flight activity. For example, a Cessna 172 operating 220 hours per year would emit approximately 2.2 tonnes of CO₂ annually, or 110 tonnes over 50 years, before accounting for SAF. With SAF, this would be reduced to just 22 tonnes over the same period. The club's commitment to transitioning to SAF, alongside ongoing improvements in aircraft efficiency and electrification, ensures that the operational phase of the development aligns with national and sectoral climate objectives.

Table 9-11 Proposed Annual Flight Hours and Associated Carbon Emissions.

Aircraft Type	Flight Hours	CO2 Kg per hour	80% Reduction with SAF	Kg CO2/Year	Tonnes CO2/Year	50 Year Lifecycle tCO2
CESSNA 172 (Based Rathcool)	200	50	10	2000	2	100
CESSNA 172(Based Rathcool)	220	50	10	2200	2.2	110
CESSNA 172(Visiting)*	16	50	10	160	0.16	8
Diamond DA40(Visiting)*	12	30	6	72	0.072	3.6
Light Sport Aircraft (Visiting)*	9	6	1.2	10.8	0.0108	0.54
Microlights (Visiting)*	9	7	1.4	12.6	0.0126	0.63
Home Built (Visiting)*	4	7	1.4	5.6	0.0056	0.28
HSE Helimed Air Ambulance EC135	320	600	120	38400	38.4	1920

*Visiting aircraft in the Rathcool zone for 5 mins per visit

9.10.2.2 Operational Impacts

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 future flooding related impacts on the site. However, adequate attenuation and drainage have been provided as part of the development design to account for increased rainfall in future years. Therefore, the impact will be long-term, localised, neutral and imperceptible.

There is the potential for the release of GHG emissions to the atmosphere during the operational phase of the development. During the operational phase of the development, greenhouse gas emissions primarily originate from aircraft movements. Additional minor emissions are associated with heating, domestic hot water, and lighting. The proposed project will introduce sustainable and renewable energy technology to the development. Ongoing maintenance of the Proposed Development materials has been accounted for within Section 9.10.1 above.

There is also the potential for increased road traffic volumes to impact climate. The change in Annual Average Daily Traffic (AADT) values is not of the magnitude to require a detailed climate assessment as per the DMRB screening criteria outlined in Section 9.6.3 (UK Highways Agency, 2019b). It can therefore be determined that traffic related CO₂ emissions during the operational phase are long-term, localised, neutral and imperceptible.

The Proposed Development has been designed to reduce the impact to climate where possible, and a number of measures have been incorporated into the design to ensure the operational phase emissions are minimised. The club is committed to transitioning its fleet to Sustainable Aviation Fuel (SAF), which is expected to reduce CO₂ emissions by up to 80% compared to conventional fuels over the lifetime of the aircraft. In addition, the club will explore the adoption of electrified light aircraft as market-ready options become available, further decreasing direct emissions from flight operations. The operational fleet will be managed to maximize efficiency, with modern aircraft types and best practices in flight planning and maintenance to minimize unnecessary fuel use. These actions, supported by national initiatives such as those from Enterprise Ireland, ensure that the increased flight activity resulting from the runway extension is aligned with national and sectoral climate objectives, and that the club's operational emissions are significantly reduced over the long term.

It is proposed to incorporate a bike shelter and electric vehicle parking spaces within the Proposed Development to promote the use of sustainable transport. Overall, these measures will aid in reducing the impact to climate during the operational phase of the Proposed Development.

In Table 9-11, operational GHG emissions have been compared against the carbon budget for the transport sector in 2030, against Ireland's total GHG emissions in 2023 and against Ireland's EU 2030 target of a 30% reduction in non-ETS sector emissions based on 2005 levels (33 Mt CO₂e) (set out in Regulation EU 2018/842 of the European Parliament and of the Council).

The estimated total GHG emissions, when annualised over the 50-year Proposed Development lifespan, are equivalent to 0.0000071% of Ireland's total GHG emissions in 2023 and 0.000126% of Ireland's non-ETS 2030 emissions target. The total GHG emissions associated with transport-related activities are 0.0000014% of the 2030 transport budget.

Table 9-12 Estimated Operational GHG Emissions relative to Transport Budget and GHG Baseline

Target/Sectoral Budget (tCO ₂ e)		Sector Annualised Proposed Development Emissions Compared	Annualised GHG are Proposed Development Emissions as % of Relevant Target/Budget
Ireland's 2023 Total GHG Emissions (existing baseline)	58,829,000	Total GHG Emissions	0.0000071%
Non-ETS 2030 Target	33,000,000	Total GHG Emissions	0.000126%
(Transport Sector) 2030 Sectoral Budget	6,000,000	Total Industry Emissions	0.0000014%

9.10.2.3 GHGA Significance of Effects

The TII guidance (2022) states that the following two factors should be considered when determining significance:

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

The level of mitigation described in Section 9.10 has been taken into account when determining the significance of the Proposed Development's construction and operational GHG emissions. According to the ISEP significance criteria described in Section 9.6.3.4 and Table 9-2, the significance of the GHG emissions during the construction and operational phase is minor adverse.

In accordance with the EPA guidelines (EPA, 2022), the above significance equates to a significance of effect of GHG emissions during the construction and operational phase, which is **direct, long-term, negative and slight, which is overall not significant**.

9.10.3 Climate Change Risk Assessment

9.10.3.1 Construction Phase

A detailed CCRA of the construction phase has been scoped out, as discussed in Section 9.6.4.5, which state that there are no residual medium or high-risk vulnerabilities to climate change hazards and therefore a detailed CCRA is not required. However, consideration has been given to the Proposed Development's vulnerability to the following climate change hazards with best practice mitigation measures proposed in Section 9.11:

- Flood risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;

- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage – including wind damage.

9.10.3.2 Operational Phase

To assess the vulnerability of the Proposed Development to climate change, it is essential to first evaluate the development's sensitivity and exposure to various climate hazards i.e. climate screening. The following climate hazards have been analysed in relation to the Proposed Development: flooding (coastal, pluvial, and fluvial), extreme heat, extreme cold, wildfire, drought, extreme wind, lightning, hail, landslides, and fog.

The sensitivity of the Proposed Development to these climate hazards is evaluated independently of its location. Table 9-12 provides a sensitivity assessment of the Proposed Development, rated on a scale from high (3) to medium (2) to low (1). After establishing sensitivity, the exposure of the Proposed Development to each climate hazard is determined, reflecting the likelihood of these hazards occurring at the project site, also rated on a scale of high (3), medium (2), and low (1). The overall vulnerability of the Proposed Development to each climate hazard is then calculated by multiplying sensitivity and exposure, as outlined in Table 9-3. This is the initial climate change screening prior to more detailed analysis utilising Climatics climate modelling.

Table 9-13 Climate Change Vulnerability Assessment/Screening

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Coastal, Pluvial, Fluvial)	1 (Low)	1 (Low)	1 (Low)
Extreme Heat	1 (Low)	1 (Low)	1 (Low)
Extreme Cold	1 (Low)	1 (Low)	1 (Low)
Wildfire	1 (Low)	1 (Low)	1 (Low)
Drought	1 (Low)	1 (Low)	1 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Landslides	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

The sensitivity and exposure of the area were assessed using various online tools such as Met Éireann's TRANSLATE tools, Climate Ireland – Climate Change Projection Maps, and DNV's Climatics multi-climate hazard analysis tool in addition to the project teams subject matter expertise. The analysis concluded that the Proposed Development has no significant vulnerabilities to the identified climate hazards, as outlined below. All identified vulnerabilities are classified as low. As a result, there are no residual medium or high-risk vulnerabilities related to climate change hazards, making a detailed Climate Change Risk Assessment (CCRA) unnecessary.

The Site-Specific Flood Risk Assessment (SSFRA) conducted by IE Consulting indicates that the runway and taxi way fall within Flood Zones A and B (high to moderate risk) and the Air Ambulance facilities (including the helicopter pad), and the wastewater treatment plant fall within Flood Zone C (low risk). The primary flood risk for the development is attributed to the River Blackwater due to its proximity to the site. Fluvial flooding occurs when high sea levels or waves cause water to overflow onto land. Records from the Office of Public Works (OPW) indicate that flooding has occurred in the area, including incidents at Rathcool Aerodrome in February 2021 and November 2009. These events were primarily caused by blockages rather than insufficient system capacity or fluvial flooding.

Given the predicted increase in the frequency and intensity of extreme rainfall events due to climate change, it is essential to incorporate site-specific drainage and management measures to mitigate the effects of surface water flooding. The proposed development includes the construction of a surface water network with Sustainable Urban Drainage Systems (SuDS) measures designed to minimise the impact on the receiving environment and manage pluvial flood risk. The Sustainable Urban Drainage Systems (SuDS) report highlights the importance of incorporating site-specific drainage and management measures to mitigate the effects of pluvial flooding due to the predicted increase in the frequency and intensity of extreme rainfall events. The proposed development includes the construction of a surface water network with SuDS measures designed to minimize the impact on the receiving environment and manage pluvial flood risk. The surface water network is designed to accommodate peak rainfall events and has sufficient capacity to handle a 1 in 100-year event plus a 30% allowance for climate change without flooding any paved surfaces. Proper operation and maintenance of the drainage system are crucial in reducing the risk of pluvial flooding due to blockages.

The Catchment Flood Risk Assessment and Management (CFRAM) mapping indicates that the primary flood risk to the proposed development site can be attributed to an extreme fluvial event in the River Blackwater, which is located adjacent to the northern boundary of the site. The CFRAM indicates that the site is not particularly at risk of pluvial or groundwater flooding. The CFRAM mapping also shows that the site falls within an OPW National Indicative Fluvial Mapping (NIFM) 1% AEP (1 in 100-year) and 0.1% AEP (1 in 1000-year) fluvial flood zone. This mapping provides a reasonably accurate delineation of fluvial flood zones at and in the general vicinity of the proposed development site.

The proposed surface water network has been designed with an allowance for climate change as per the CCC CDP 2022-2028. The design accommodates flows in peak rainfall events, and the drainage system has sufficient capacity to accommodate a 1 in 100 Year plus 30% Climate Change event below ground without flooding any of the paved surfaces. The correct operation and maintenance of the drainage system is necessary to reduce the risk of human or mechanical error causing pluvial flood risk from blockage. The CFRAM mapping available for the site indicates that the pluvial flood risk to the development is low.

Groundwater flooding occurs when the water table rises above the land surface, this means the natural underground drainage system is incapable of sufficiently draining itself, resulting in the emergence of groundwater at the surface. It generally requires sustained rainfall over relatively longer duration than other forms of flooding, its location is discontinuous, and they

can last for weeks or months. The SSFRA has determined that the Proposed Development is not at risk of groundwater flooding.

Regarding wildfires, the Think Hazard! tool developed by the Global Facility for Disaster Reduction and Recovery classifies the wildfire hazard in the area as low. This classification suggests there is a 4% to 10% chance of weather conditions that could support a problematic wildfire in the project area, potentially causing disruptions and posing a low but real risk to life and property each year. Although future climate models predict an increase in conditions favourable to wildfires—such as higher temperatures and extended dry periods—the project's suburban location significantly reduces the wildfire risk. Therefore, the Proposed Development is considered to have a low vulnerability to wildfires.

According to the Landslide Susceptibility Map developed by Geological Survey Ireland (GSI), the Proposed Development Site ranges from Low to Moderately Low in terms of landslide susceptibility.

Extreme temperatures, whether extreme heat or cold, have the potential to affect building materials and associated infrastructure. During the detailed design stage, high-quality, durable, and resilient materials will be selected to withstand future temperature fluctuations due to climate change. Consequently, the Proposed Development is assessed to have at most, low vulnerabilities to these climate hazards, and a detailed risk assessment is not necessary.

There is no additional vulnerability with respect to all climate hazards when design mitigation has been put in place in order to alleviate this known vulnerability to future climate change risk.

9.10.3.3 CCRA Significance of Effects

With the implementation of design mitigation measures, the Proposed Development faces no substantial risks from climate change. As outlined in the EPA Guidelines (EPA, 2022), the impacts of climate change on the development are considered **direct, long-term, negative, and imperceptible**, and are therefore **not deemed significant** in terms of Environmental Impact Assessment (EIA).

9.10.4 Potential Cumulative Impacts

Regarding the requirement for a cumulative assessment, TII PE-ENV-01104 (2022) indicates that "since the GHG assessment pertains to global climate and the impacts on the receptor from a project are not geographically constrained, the typical approach for cumulative assessment in EIA is not deemed applicable." However, by evaluating the GHG impact of a project in relation to its alignment with Ireland's trajectory towards net zero and sectoral carbon budgets, this assessment will demonstrate the project's potential influence on Ireland's ability to meet its national carbon reduction targets. Consequently, the assessment approach is inherently cumulative.

The following potential cumulative impacts related to climate have been considered within this Environmental Impact Assessment Chapter. Cumulative impacts result from the combined effects of the Proposed Development alongside other existing or planned developments in the area. These impacts can intensify climate-related risks and environmental pressures, leading to more pronounced and widespread consequences. ISEP emphasises the importance of

understanding these interactions to develop effective mitigation and adaptation strategies that align with broader sustainability objectives.

Greenhouse Gas (GHG) Emissions

As per ISEP's guidance on assessing climate change within EIAs (2022), the cumulative effect of GHG emissions from the Proposed Development, in conjunction with other developments, must be carefully evaluated. The aggregation of emissions across multiple projects can significantly contribute to global climate change, exacerbating the effects of rising temperatures, more frequent extreme weather events, and changes in precipitation patterns. To address this, we have identified robust mitigation measures aimed at reducing the development's carbon footprint, ensuring alignment with regional and national climate targets, and adhering to the principles of the EU Taxonomy. No nearby emission sources were identified.

Water Resources and Flooding

ISEP (2022) stresses the importance of considering cumulative impacts on water resources, particularly with respect to flood risks and water availability. The combined effect of increased rainfall due to climate change and additional impermeable surfaces from multiple developments can overwhelm existing drainage infrastructure, leading to a higher frequency and severity of flooding events. This underscores the need for integrated water management strategies that enhance the resilience of water systems and incorporate climate adaptation measures, such as sustainable urban drainage systems (SUDS), as recommended within the site-specific flood risk assessment.

Biodiversity and Habitat Loss

Cumulative impacts on biodiversity are another significant concern. ISEP guidance (2022) highlights that climate change, coupled with habitat loss from multiple developments, can lead to more severe impacts on ecosystems and species. The fragmentation of habitats and disruption of ecological networks can accelerate species decline and reduce ecosystem resilience. To mitigate these impacts, the EIA should incorporate strategies for habitat conservation, restoration, and connectivity, ensuring that biodiversity is protected and enhanced in the face of cumulative pressures.

Air Quality and Human Health

ISEP also advises considering the cumulative impacts on air quality and human health. Increased emissions from multiple developments can lead to higher concentrations of pollutants, exacerbating climate change-related health risks, such as respiratory conditions and heat-related illnesses. The EIA should ensure that air quality management plans are in place and that mitigation measures are designed to minimise emissions, particularly in urban areas where cumulative impacts are more likely to be significant.

Soil Degradation and Erosion

Cumulative impacts on soil degradation and erosion are another area of concern highlighted by ISEP. The combined effects of climate change-induced extreme weather events and land

disturbance from construction activities can lead to accelerated soil erosion, reduced fertility, and increased sedimentation in water bodies. Sustainable land management practices, including erosion control measures and soil conservation techniques, should be integrated into the development to mitigate these cumulative impacts.

Infrastructure and Energy Demand

Finally, ISEP's guidance emphasises the importance of considering the cumulative impacts on infrastructure and energy demand. As multiple developments increase the demand for energy, there is a risk of overloading local grids and increasing reliance on fossil fuels, which could exacerbate GHG emissions and climate change. The Proposed Development does promote energy efficiency, the use of renewable energy sources, and the integration of smart grid technologies to ensure that infrastructure can accommodate future energy needs without compromising climate goals.

9.10.5 Mitigation and Monitoring

In accordance with ISEP guidance (2022), addressing cumulative impacts requires a comprehensive approach that includes effective mitigation strategies and ongoing monitoring. These strategies should focus on enhancing energy efficiency, reducing GHG emissions, protecting natural habitats, managing water resources sustainably, and ensuring resilient infrastructure. Continuous monitoring and adaptive management will be essential to identify cumulative impacts early and to adjust mitigation measures as necessary to minimise long-term environmental and climate-related risks.

By considering cumulative impacts within the climate chapter of the EIA, we ensure a thorough and responsible assessment that aligns with ISEP's best practices, contributing to the sustainability and resilience of both the Proposed Development and the broader environment.

9.10.6 "Do Nothing" Impact

Under the Do-Nothing Scenario no construction works will take place and the previously identified impacts of carbon emissions from equipment, machinery and development operation will not occur. Therefore, this scenario can be considered neutral in terms of climate.

9.11 Avoidance, Remedial & Mitigation Measures

9.11.1 Construction Phase

9.11.1.1 *Climate Resilience Avoidance, Remedial & Mitigation Measures*

During the construction stage specific climate resilience measures should focus on ensuring durability, water management, and energy efficiency while mitigating risks associated with extreme weather. Regarding the development's resilience to climate change, the Contractor will be required to mitigate the effects of extreme weather, such as heavy rainfall, flooding, windstorms, and temperature fluctuations, through site risk assessments and method statements.

Here are key Avoidance, Remedial & Mitigation Measures:

Foundation & Site Preparation

- **Flood Resilient Foundations:** Use raised foundations, elevated platforms, or piling where necessary in flood-prone areas.
- **Sustainable Drainage Installation:** Implement permeable surfaces, drainage channels, and attenuation tanks early in construction.
- **Soil Stabilisation:** Prevent erosion with silt fences, geotextiles, and retaining structures to withstand heavy rainfall.

Structural Reinforcement

- **Wind-Resistant Framing:** Use reinforced concrete or steel frames with proper anchoring to withstand storms.
- **Secure Roof Fixings:** Ensure hurricane straps, reinforced trusses, and mechanically fixed roof tiles to prevent wind damage.
- **Impact-Resistant Windows & Doors:** Install reinforced glass or shutters to reduce storm-related damage.

Water & Moisture Management

- **Damp-Proofing Measures:** Use high-quality damp-proof membranes (DPM) and damp-proof courses (DPC) in walls and floors.
- **Proper Drainage on Site:** Ensure temporary drainage solutions (e.g., trenches, sumps) to manage rainwater during construction.
- **Weatherproofing Structures:** Apply breathable but water-resistant membranes on external walls before cladding installation.

Material Selection & Handling

- **Use Climate-Resilient Materials:** Opt for treated timber, marine-grade plywood, concrete with low permeability, and corrosion-resistant steel.
- **Storage & Protection of Materials:** Keep materials covered and off the ground to prevent water damage or degradation.
- **Low-Carbon Concrete & Insulation:** Use alternatives like GGBS (Ground Granulated Blast-furnace Slag) concrete and eco-friendly insulation.

Energy Efficiency & Passive Design Implementation

- **High-Performance Insulation Installation:** Ensure proper fitting to avoid thermal bridging and moisture ingress.
- **Airtightness Testing During Construction:** Conduct interim blower door tests before final finishes to confirm air sealing effectiveness.
- **Green Roof Base Layers:** Install waterproofing and root barriers early if a green roof is part of the design.

On-Site Climate Adaptation Measures

- Construction Scheduling Considerations: Plan for extreme weather events, avoiding major excavation or external works in heavy rain seasons.
- Cold/Hot Weather Plan: Strategies such as planned road gritting, thermal protection, chemical accelerants, temporary enclosures, and alternative heating/cooling solutions enable builders to overcome these obstacles and achieve successful project outcomes.
- Temporary Wind & Rain Barriers: Use tarpaulins, scaffolding covers, and temporary roofing to protect partially built structures.
- Emergency Power Supply: Have generators or battery backups on site to maintain critical construction processes.

9.11.1.2 GHG Resilience Avoidance, Remedial & Mitigation Measures

Embodied carbon of materials and construction activities is the primary source of climate impacts during the construction phase. Pre-construction carbon Avoidance, Remedial & Mitigation Measures include:

Design for Performance

- Request a Design for Performance approach from design teams and contractors.
- Include contractual targets for whole life carbon with a focus on Net Zero and nature-positive goals where possible.

Circularity in Design

- Require design teams to develop a circularity concept for projects, focusing on adaptability, disassembly, and reuse.
- Set a target for a percentage of reused and recycled materials in designs.

Carbon Literacy

- Develop carbon literacy within design and construction teams by providing training on carbon literacy, ESG reporting, and disclosure.
- Incorporate sustainability and carbon considerations into site team talks, construction targets, and reporting.
- Include training clauses for contractors and sub-contractors to upskill their teams in low-energy construction techniques.

Cement Reduction

- Specify the minimum amount of cement needed in concrete and substitute where feasible to reduce cement usage.

Sustainable Procurement

- Review sustainable procurement and material choices during detailed design to identify and implement lower embodied carbon options.

- Request Environmental Product Declarations (EPDs) and prefer products with EPDs where possible within procurement restrictions.
- Drive demand for EPDs by increasing the percentage of products used in the project with EPDs.

Energy and Carbon Performance Reporting

- Plan to disclose the operational energy and carbon performance of the project in your annual reporting.

Construction Waste Management

- Create a demolition and construction programme allowing sufficient time to determine reuse and recycling opportunities for demolition waste.
- Appoint a competent demolition contractor to undertake a pre-demolition audit detailing resource recovery best practice and identifying materials for reuse and recycling.
- Reuse materials on site in the new build areas where possible.

EU Taxonomy Compliance

- Commit to complying with EU taxonomy requirements on the circular economy, specifically reuse, recycling, and material recovery of demolition and construction waste.
- Review and ensure compliance with the EU Taxonomy Regulation (EU) 2020/852 regarding circular economy practices for demolition and construction waste.

Local Material Sourcing

- Source materials locally where possible to reduce transport-related CO2 emissions.

Rathcool Flying Club sustainability goals outlines the Aerodrome's strategies to reduce carbon emissions. The Rathcool Flying Club has set ambitious sustainability goals to enhance its environmental impact in the medium to long term. By 2030, the club aims to convert its Cessna aircraft to Sustainable Aviation Fuel (SAF), which will be available from Cork airport by 2025. This transition to SAF is expected to reduce CO2 emissions by 90%, noise by 40%, and increase the aircraft's range by 40%, thereby reducing refuelling requirements. Additionally, by 2040 to 2050, the club plans to have all its planes either using SAF or being fully electric. The adoption of electric planes, which are anticipated to become more viable and economical over the next 5 to 10 years, will further reduce noise and operating costs. The club also envisions utilising solar panels on the aircraft hangar roof to provide clean power for the site. These strategies collectively contribute to a comprehensive approach to reducing the club's carbon footprint across Scope 1, 2 and 3 of the GHG Protocol of emissions.

Scope 1: Direct emissions from sources owned or controlled by the organisation, such as fuel use in vehicles. The club's strategy to convert its Cessna aircraft to Sustainable Aviation Fuel (SAF) by 2030 directly addresses Scope 1 emissions. SAF is expected to reduce CO2 emissions by 90%, which significantly lowers the direct emissions from the club's aircraft.

Additionally, the long-term goal of transitioning to fully electric planes by 2040-2050 will further reduce direct emissions, as electric planes produce no direct CO2 emissions

Scope 2: Indirect emissions from the company's energy consumption, like electricity usage. The plan to install solar panels on the aircraft hangar roof to provide clean power for the site addresses Scope 2 emissions. By generating renewable energy on-site, the club can reduce its reliance on electricity from the grid, which may be generated from fossil fuels. This shift to renewable energy sources will decrease the club's indirect emissions associated with electricity usage.

Scope 3: Emissions not directly produced by the company but indirectly tied to its value chain, including product sourcing, usage, and disposal. Scope 3 encompasses emissions not covered by Scopes 1 and 2. Direct emissions from sources owned or controlled by the organisation, such as fuel use in vehicles. The club's strategy to convert its Cessna aircraft to Sustainable Aviation Fuel (SAF) by 2030 directly addresses Scope 1 emissions. SAF is expected to reduce CO2 emissions by 90%, which significantly lowers the direct emissions from the club's aircraft.

Additionally, certified datasheets for construction materials will outline their operational temperature limits, ensuring that temperature-sensitive materials perform adequately. The Contractor will also address risks associated with fog, lightning, and hail through appropriate risk assessments and mitigation plans.

During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- **Energy-Efficient Equipment:** Use energy-efficient machinery and equipment on-site. Regular maintenance and proper operation can also help reduce fuel consumption and emissions.
- **Renewable Energy:** Incorporate renewable energy sources, such as solar panels, to power construction activities. This can significantly reduce reliance on fossil fuels
- **Reduce Idling:** Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- **Sustainability Awareness:** Ensure that sustainability and carbon specifically is incorporated into site team talks, construction and reporting targets. Integrate training clauses for contractors and sub-contractors to upskill their onsite personnel including sub-contractors in low energy construction skills. Appoint sustainability champions to ensure that the project continues to perform in a sustainable manner.
- **Sustainable Transportation:** Encourage carpooling, use of public transportation, or electric vehicles for workers commuting to the site.
- **Monitoring and Reporting:** Regularly monitor and report GHG emissions from the construction site. This helps in identifying areas for improvement and ensuring compliance with environmental standards Sustainability spot checks should be added to ongoing site inspections and feedback shared with all onsite to ensure measures are being adopted.
- **Maintenance:** Ensure all plant and machinery are well maintained and inspected regularly.
- **Waste Management:** Implement a robust waste management plan to reduce, reuse, and recycle construction waste. Proper waste management can significantly cut down

on emissions Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. Application of the waste hierarchy to all waste material generated.

- **Sustainable Procurement:** Sourcing low carbon materials locally where possible to reduce transport related CO2 emissions.

9.11.2 Operational Phase

A number of measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the Proposed Development to climate change (see Section 9.7.3).

The Proposed Development has been designed to reduce the impact on climate as a result of energy usage during operation. There are a number of incorporated design mitigation measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible.

Such measures included in the Proposed Development to reduce the impact to climate are:

- Landscape Design Considerations include:
 - Biodiversity Net Gain (BNG): Hedgerows will be planted to enhance biodiversity. This involves planting 500 linear meters of diverse species such as Hawthorn, Blackthorn, Crab Apple, Willow, and Holly. Additionally, a secondary hedgerow will be planted inside the existing hedge, doubling its width and adding 290 linear meters. This increased vegetation will help sequester carbon and improve air quality.
 - Compensatory Woodland Planting: A new native woodland planting area of 1000m² is to be planted to the south of the site. The selected native tree species, such as Scots Pine, Common Holly, Common Alder, Downy Birch, Willow, Bird Cherry, and Common Oak, are compatible with the existing site conditions and will contribute to carbon sequestration.
 - Retention of Existing Landscape Features: The Proposed Development seeks to retain as many existing landscape features as possible, including stands of trees, hedgerows, and grassland meadows. This minimizes the need for new planting and reduces the carbon footprint associated with landscaping activities.
 - Use of Native Species: The planting of native species is emphasized throughout the design. Native species are well-adapted to the local environment, requiring less maintenance and reducing the need for chemical inputs such as fertilizers and pesticides.
 - Hay Strewing for Meadow Restoration: The construction works will include the decommissioning of the existing grass runway and the restoration of the meadow using a process called Hay Strewing. This involves collecting seed from the existing meadow and distributing it on bare soil, avoiding the need for imported seed and reducing the carbon footprint associated with transportation.

- Pollarding of Hedgerows: The existing hedgerows will be reduced to a maximum height of 2 meters at several locations to facilitate the approach to the runway. This practice helps maintain the health of the hedgerows and reduces the need for frequent pruning, thereby lowering carbon emissions from maintenance activities.
- Low-Carbon Operational Practices include:
 - Transition to Sustainable Aviation Fuel (SAF): By 2030, the club aims to convert its Cessna aircraft to SAF, which will be available from Cork airport by 2025. SAF is expected to reduce CO2 emissions by 90%, noise by 40%, and increase the aircraft's range by 40%, thereby reducing refuelling requirements.
 - Adoption of Electric Planes: By 2040 to 2050, the club plans to have all its planes either using SAF or being fully electric. Electric planes, which are anticipated to become more viable and economical over the next 15 to 20 years, will further reduce noise and operating costs.
 - Solar Panels on Aircraft Hangar Roof: The club envisions utilizing solar panels on the aircraft hangar roof to provide clean power for the site. This will reduce the reliance on grid electricity and lower indirect emissions associated with energy consumption.
 - Efficient Aircraft Operations: The increased range of SAF-powered aircraft will reduce the frequency of refuelling, leading to lower emissions associated with fuel transportation and handling.
 - Improved Runway and Taxiway Design: The construction of a hard-surfaced runway, taxiway, and helipad with associated ground-level lighting will enhance the efficiency and safety of aircraft operations, potentially reducing fuel consumption and emissions during take-off and landing.

In addition, electric vehicle and bicycle parking will be provided within the development which will promote the use of more sustainable modes of transport and reduce potential transport emissions.

9.12 Residual Impacts

The Proposed Development will result in some impacts to climate through the release of GHGs. ISEP (2022) state that the crux of assessing significance is “not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050”. The Proposed Development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible, the development will comply with the do-minimum standards set through regulation (NZEB and Part L 2021). As per the assessment criteria in section 9.6.4.4 the impact of the Proposed Development in relation to GHG emissions is considered **long-term, minor adverse and not significant**.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the Proposed Development as a result of climate change.

9.13 Risk of Major Accidents or Disasters

As detailed in Section 9.10.3.1, climate change could shift weather patterns and lead to more frequent rainfall in the coming years. Nonetheless, a thorough review of the potential flood risk at the site has been conducted, and sufficient measures for attenuation and drainage have been incorporated to address increased rainfall. The Proposed Development has been evaluated as having a low susceptibility to climate change-related hazards, with no major risks identified. Consequently, the impact is considered direct, long-term, negative, and imperceptible, and is therefore not deemed significant in terms of the Environmental Impact Assessment (EIA).

9.14 Worst Case Scenario

Worst case estimates have been used as part of this assessment. As a result, Section 9.11 details the worst-case impact for the Proposed Development.

9.15 Monitoring

9.15.1 Construction Phase

We recommend the following monitoring strategies to ensure compliance with the environmental objectives outlined in this EIA. These strategies are essential for effectively managing the environmental impacts associated with the demolition and construction phases, with a particular focus on resource recovery, waste management, and the reduction of GHG emissions.

Monitoring of Demolition Waste Reuse and Recycling

To optimise the reuse and recycling of demolition materials, we recommend implementing the following:

- **Material Reuse Tracking System:** A digital tracking system could be established to monitor materials identified for reuse or recycling. This system will log details such as quantities, conditions, and intended applications within the new construction areas. It is important that this system is regularly updated to reflect ongoing recovery efforts.
- **Weekly Progress Reports:** It is suggested that the demolition contractor be required to submit weekly progress reports. These reports should provide detailed metrics on the volumes of materials recovered, reused, and recycled, alongside any challenges encountered. This approach will allow for the early identification of issues and timely adjustments to the recovery plan.
- **Regular On-Site Inspections:** It is suggested that regular inspections are conducted to verify that materials earmarked for reuse are being properly stored and handled. These inspections should ensure that materials remain in suitable condition for their intended use in the new build areas.

Competency and Performance of Demolition Contractor

To ensure that the demolition process aligns with the project's environmental goals, we propose the following monitoring measures:

- **Verification of Pre-Demolition Audit:** The pre-demolition audit conducted by the appointed contractor should be thoroughly reviewed to confirm that all materials and

components suitable for reuse or recycling have been accurately identified. This review will ensure that the audit reflects best practice in resource recovery.

- **Periodic Contractor Performance Reviews:** We suggest conducting periodic performance reviews of the demolition contractor. These reviews should focus on their adherence to the resource recovery plan, the accuracy of material identification, and their overall compliance with project timelines without compromising environmental standards.

Compliance with EU Taxonomy for Circular Economy

Given the project's commitment to meeting EU taxonomy requirements, we recommend the following:

- **Comprehensive Documentation and Reporting:** It is essential to maintain detailed records that document compliance with the circular economy principles outlined in the EU taxonomy. This documentation should include logs of all recycled materials, percentages of materials reused on-site, and detailed descriptions of how circular economy practices are being implemented.
- **Independent Third-Party Audits:** It is suggested that an independent auditor is engaged to periodically assess the project's compliance with the EU taxonomy. The audit should verify the accuracy of reported data and ensure that the circular economy requirements are fully adhered to throughout the project.

Monitoring of GHG Emissions Reduction Measures

To mitigate the project's impact on climate change, the following monitoring activities are proposed:

- **Appoint sustainability champions** to ensure that the project continues to perform in a sustainable manner including monitoring and reporting of performance on site.
- **Idle Time Monitoring for Vehicles and Machinery:** It is suggested that GPS or telematics systems are installed on all vehicles and machinery used on-site to monitor engine idling times. Automatic alerts should be set up to notify site managers when idling exceeds a specified threshold, enabling prompt corrective action to reduce unnecessary emissions.
- **Maintenance Logs for Plant and Machinery:** Implementing a digital maintenance log system to track the inspection and maintenance of all on-site equipment is recommended. This system should record inspection dates, maintenance activities, and any identified issues, ensuring that all machinery operates efficiently and with minimal emissions.
- **Material Waste Minimisation Tracking:** A monitoring system should be developed to track material orders and usage. This system should identify trends in over-ordering or inefficient material use, enabling the project team to take corrective actions that will help minimise the embodied carbon footprint of the site.

Application of Waste Hierarchy

To optimise waste management on-site, the following monitoring protocols are suggested:

- **Waste Segregation Audits:** Regular audits should be conducted to ensure that waste is being properly segregated according to the waste hierarchy (reduce, reuse, recycle).

These audits will help identify opportunities for improving waste management practices and reducing overall waste generation.

- **Monthly Waste Management Reports:** It is suggested that monthly reports are generated detailing the volume of waste reduced, reused, and recycled. These reports should be compared against predefined targets to assess the effectiveness of the waste management strategies and to identify areas for improvement.

Local Sourcing of Materials

To reduce transport-related emissions and support local suppliers, the following measures are suggested:

- **Supplier Distance Monitoring:** A database of suppliers should be developed, documenting the distance of each supplier from the construction site. This database should be used to monitor and minimise the carbon footprint associated with material transportation, prioritising local suppliers wherever possible.
- **Transport-Related Carbon Footprint Analysis:** Conducting a carbon footprint analysis for the transportation of all materials to the site is recommended. This analysis should inform the selection of suppliers, with a preference for those within a closer radius to reduce CO2 emissions.

These monitoring recommendations are designed to ensure that the project adheres to its environmental commitments, particularly in the areas of resource recovery, waste management, and greenhouse gas emissions reduction. By implementing these strategies, the project will not only comply with regulatory requirements but also contribute to broader environmental sustainability goals. Regular reporting, on-site inspections, and third-party audits will be critical to maintaining compliance and achieving the desired environmental outcomes.

9.15.2 Operational Phase

Environmental Management Plan that incorporates adaptive management principles.

Ensure climate change resilience plans are robust; continued monitoring of trends in weather events; and continued review of resilience measures related to interdependencies.

We recommend the following monitoring strategies to ensure that the Proposed Development meets its environmental objectives. These strategies focus on mitigating the impacts of climate change, enhancing energy efficiency, and promoting sustainable transport, all of which are aligned with best practices outlined in ISEP guidelines.

Monitoring of Climate Change Mitigation Measures

- **Attenuation and Drainage Systems Monitoring:** Consistent with ISEP's guidance on climate resilience, regular inspections should be undertaken to verify the functionality of the attenuation and drainage systems. These inspections should be conducted during construction, after significant rainfall events, and periodically thereafter to ensure long-term effectiveness in preventing flooding.
- **Climate Vulnerability Assessment Review:** In accordance with ISEP's recommendation to periodically reassess climate risks, we suggest reviewing the climate vulnerability assessment (as detailed in Section 9.7.3) at regular intervals. This

review should incorporate the latest climate projections to ensure the mitigation measures remain adequate and effective.

Monitoring of Energy Efficiency and Climate Impact Reduction

To minimise the environmental impact of aircraft operations and align with Rathcool Flying Club's sustainability objectives, the following monitoring measures are recommended:

- **Fuel Efficiency Monitoring:** Track fuel consumption per flight hour and per passenger to ensure efficient engine performance. Implement regular engine health checks and propeller balancing to maintain optimal efficiency.
- **Carbon Emissions Tracking:** Record and report CO₂ emissions for all flights. Compare performance against industry benchmarks and identify opportunities for reduction through operational improvements.
- **Sustainable Aviation Fuel (SAF) Integration:** Where feasible, monitor the use of SAF or blended fuels. Establish targets for SAF adoption and verify compliance through fuel purchase records.
- **Flight Planning Optimisation:** Monitor adherence to efficient flight planning practices, including optimal routing, reduced taxi times, and weight management. Use GPS and flight data to assess and improve operational efficiency.
- **Maintenance and Engine Performance Audits:** Conduct periodic audits to ensure engines and systems are operating within manufacturer specifications for fuel burn and emissions. Implement predictive maintenance to avoid inefficiencies.
- **Noise and Environmental Impact Monitoring:** Track noise levels during take-off and landing to ensure compliance with local regulations and minimise community impact. Consider quieter approach procedures where possible.

Monitoring of Sustainable Transport Initiatives

To promote sustainable transport and reduce transport-related emissions, the following monitoring strategies are suggested:

- **Electric Vehicle (EV) and Bicycle Parking Usage:** Regular monitoring should be carried out to assess the usage of electric vehicle charging stations and bicycle parking facilities within the development. This will help gauge the effectiveness of these measures in promoting sustainable transport modes. Usage data can inform whether additional facilities or adjustments are needed.
- **Transport Emissions Impact Assessment:** Periodic assessments should be conducted to evaluate the impact of the provided sustainable transport facilities on reducing overall transport emissions. This could include monitoring the uptake of electric vehicles by residents and the corresponding reduction in GHG emissions.

These monitoring recommendations are designed to ensure that the development's climate change mitigation measures, energy efficiency initiatives, and sustainable transport provisions are effectively implemented and maintained throughout the lifecycle of the project. By adhering

to these strategies, the development will not only comply with relevant regulatory requirements but also contribute to broader environmental sustainability goals. Regular inspections, energy performance assessments, and occupant engagement will be crucial to achieving the desired environmental outcomes.

9.16 Interactions

Climate interactions with various environmental topics are extensive and significant, highlighting the broad impact of climate factors across different aspects of the environment. One of the most critical interactions is between climate and GHG emissions. The Proposed Development's carbon footprint, which includes emissions from construction activities, energy use, and transportation, plays a role in influencing climate change. Effective management and reduction of these emissions are crucial to mitigate the project's contribution to global warming and to comply with regulatory requirements and sustainability targets.

Interactions between climate and water resources are also notable. Climate variability, such as increased rainfall or prolonged droughts, can affect water availability, quality, and management practices. This includes impacts on stormwater runoff, flood risk, and water supply. The development must incorporate effective water management strategies to address these potential issues and ensure resilience to changing climate conditions.

The relationship between climate and biodiversity is significant as well. Changes in temperature and precipitation patterns can alter habitat conditions, disrupt species distributions, and affect ecological balances. These shifts may impact local flora and fauna, necessitating careful consideration of conservation measures to protect biodiversity within and around the development area.

Soil interactions with climate are critical, with changes in climate affecting soil moisture, erosion rates, and land productivity. Increased rainfall may lead to soil erosion, while extended dry periods can degrade soil quality. Addressing these interactions is essential for maintaining soil health and implementing sustainable land use practices.

Human health and well-being are closely linked to climate factors, with climate change potentially exacerbating health issues such as heat stress, respiratory conditions, and vector-borne diseases. The development's impact on local climate conditions and its potential influence on public health must be carefully assessed to prevent adverse health outcomes.

Cultural heritage sites are also at risk due to climate change, with increased weathering, flooding, and temperature fluctuations potentially accelerating their deterioration. Protecting these valuable resources requires assessing the potential impacts of climate change and implementing appropriate conservation measures.

In summary, the Proposed Development's interactions with climate encompass a range of factors including GHG emissions, water resources, biodiversity, soil, human health, and cultural heritage. Effective mitigation strategies and robust monitoring will be essential to address these interactions, minimise adverse impacts, and ensure the development's resilience to climate change.

9.17 Difficulties Encountered When Compiling

Overall, there were no major difficulties encountered when compiling this assessment. Slight difficulties were encountered during the quantification of materials at the design stage in order to assess the embodied construction carbon as detailed in section 9.6.6.

9.18 Conclusion

The assessment of potential adverse effects resulting from the Proposed Development on climate change in this chapter has identified the potential sources of greenhouse gas emissions and vulnerability of the site to climate change.

It is reasonably considered that following all mitigation measures including design embedded and prescribed, adequate implementation of construction phase mitigation, and adherence to operational best practice that no significant effects to climate change will arise from the Proposed Development during the construction or operational phases.

9.19 References

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10 NOISE AND VIBRATIONS

ICAN Acoustics has been engaged by Management at Rathcoole Aerodrome, Knockcahill, Rathcool, Mallow, Co. Cork, to assess the likely impact of a proposed construction of a hard surface runway, taxiway, helipad and several changes to a paramedic prefab base and a new wastewater treatment plant and vehicle entrance. It is understood that the Planning Department at Cork County Council has requested further information, which will be addressed in this report. ICAN Acoustics has prepared this Chapter to assess the potential noise and vibration impacts of the Proposed Development in accordance with current relevant standards and guidance.

The description of the Proposed Development is as follows: *"The construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing paramedic prefabricated base and crew prefabricated base to the east of the site, and construction of a replacement paramedic prefabricated base and crew prefabricated base to the west of the site; and the breaking up / removal of a helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary wastewater treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, site landscaping and all other associated site development works. An Environmental Impact Assessment Report (EIAR) has been prepared and will be submitted with the application to the Planning Authority. The EIAR will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy during office hours at the offices of the Planning Authority. A Natura Impact Statement will be submitted to the planning authority with the application. The Natura Impact Statement will be available for inspection or purchase at a fee not exceeding the reasonable cost of making a copy during office hours at the offices of the Planning Authority."*

This Chapter includes a description of the existing receiving ambient noise climate, contributions from current aircraft movements at the existing runway in the vicinity of the subject site and an assessment of the potential noise and vibration impact associated with the Proposed Development during both the short-term construction phase and the long-term operational phase on its surrounding environment.

The assessment of direct, indirect, and cumulative noise effects on the surrounding environment has been included. Mitigation measures are included, where relevant, to ensure the Proposed Development is constructed and operated in an environmentally sustainable manner, thereby minimising its impact on the receiving environment.

10.1 Quality Assurance and Competency of Experts

Diarmuid Keaney is a noise and vibration consultant with ICAN Acoustics, established in 1998. ICAN Acoustics has a diverse range of clients, including state authorities, national power companies, industrial, and private clients. Diarmuid holds a Master of Science in Applied Acoustics from Derby University, a Diploma in Acoustics in Noise Control, and a BE Honours Degree from the National University of Ireland. Diarmuid was awarded a distinction on

completing his M.Sc. in Applied Acoustics and was graded an (A-) for his independent study project. He is a full member and Chair of the Irish Branch of the Institute of Acoustics, as well as Chair of the Association of Acoustic Consultants of Ireland, the UK's Institute of Acoustics, the Acoustical Society of America, and the Institute of Sound and Communication Engineers. Diarmuid has been a member of the Irish Branch of the Institute of Acoustics since 2010.

10.2 Authors' Formal Qualifications

Table 10-1: Authors' Formal Qualifications

Qualification	Year	Grade	Awarding Institute
M.Sc. in Applied Acoustics	March 2010	Distinction	University of Derby, United Kingdom.
Diploma in Acoustics and Noise Control	June 2006	Merit	Institute of Acoustics /University of Ulster.
B.Eng (Hons) in Industrial Engineering & Information Systems.	July 1994	2:1	University of Galway.

10.3 Study Methodology

The assessment has been undertaken to identify the most appropriate guidance documents on environmental noise and vibration, as outlined in the following sections of this Chapter. An overview of the methodology undertaken for this noise and vibration impact assessment is outlined below:

- A detailed baseline noise study has been undertaken to characterise the baseline environment in areas most likely affected by noise associated with the Proposed Scheme. Baseline noise measurements have been conducted through site-specific noise monitoring at noise-sensitive locations (NSLs) within the vicinity of both the existing and proposed facilities.
- A review of the most applicable standards and guidelines has been undertaken to set a range of acceptable noise and vibration criteria for the construction and operational phases of the Proposed Development.
- Predictive calculations and impact assessments of the likely construction-phase noise and vibration impacts have been undertaken at the NSLs in the construction work areas associated with the Proposed Development.
- A schedule of mitigation measures has been incorporated to reduce, where necessary, the identified potential noise and vibration impacts associated with the Proposed Development.

10.3.1 Construction Phase -Noise Impact.

No published statutory Irish guidance exists on the maximum permissible noise and vibration levels generated during a project's construction phase. However, it is common practice to control noise and vibration impacts in accordance with BS 5228:2009+A1:2014, the Code of Practice for Noise and Vibration Control on Construction and Open Sites, Parts 1 and 2.

BS5228:2009+A1:2014 requires designating a residential receptor location to one of three categories (A, B, or C) based on existing ambient noise levels, excluding construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a significant

noise impact from the construction activities. Following the BS5228 guidance, note that this assessment criterion only applies to residential receptors.

BS 5228:2009+A1:2014 Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2

Assessment category and threshold value period	Threshold value, in decibels (dB) $(L_{Aeq,T})$ $(L_{Aeq,T})$		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23.00–07.00)	45	50	55
Evenings and weekends ^{D)}	55	60	65
Daytime (07.00–19.00) and Saturdays (07.00–13.00)	65	70	75

NOTE 1 A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise. $(L_{Aeq,T})$

NOTE 3 Applied to residential receptors only.

^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

^{B)} Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

^{C)} Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

^{D)} 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

10.3.2 TII Guidelines

The Transport Infrastructure Ireland Noise Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes (March 2024) outlines acceptable construction noise levels for national road projects. These limits have been derived for the construction of new national road projects that predominantly pass through rural areas, where ambient noise levels are quieter than in urban areas. Table 10-2 of Transport Infrastructure Ireland's Guidelines sets out the following indicative levels of acceptability for construction noise, noting that more stringent limits may be appropriate in areas with low pre-existing noise levels.

Table 10-2: TII Noise Guidelines 2003- Maximum permissible noise levels at the façade of dwellings during construction

Day and Time	$L_{Aeq}(1hr)$	$L_pA(max),$ slow
Monday to Friday 07:00 to 19:00hrs.	70dB	80dB
Monday to Friday, 19:00 to 22:00hrs.	60dB	65dB
Saturday 08:00hrs to 16:30hrs.	65dB	75dB
Sundays and Bank Holidays 08:00hrs to 16:30hrs.	60dB	65dB

10.3.3 Construction Phase -Vibration

Peak particle velocity (PPV) is commonly used to assess buildings' structural response to vibration. This assessment refers to the following documents to discuss appropriate PPV limit values: the three vibration standards for this project.

- British Standard BS7385: 1993: Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground-borne vibration
- British Standard BS5228-2: 2009 + A1: 2014: Code of practice for noise and vibration control on construction and open sites – Vibration.
- BS5228-2 and BS7385 advise that, for soundly constructed residential properties and similar structures that are generally in good repair, a threshold for minor or cosmetic (i.e. non-structural) damage should be taken as a peak component particle velocity (in the frequency range of predominant pulse) of 15mm/s at 4Hz, increasing to 20mm/s at 15Hz and 50mm/s at 40Hz and above. The standard also notes that below 12.5 mm/s PPV, the risk of damage tends to zero.

10.3.4 Operational Phase-Noise

Noise from Mechanical Plant

BS 4142:2014: Methods for rating and assessing industrial and commercial sound are commonly used to analyse building services plant sound emissions at residential receptors. BS 4142 describes methods for rating and evaluating the sound of an industrial and commercial nature. The techniques described in this British Standard use outdoor sound levels to determine the likely effects of sound on people inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

For an appropriate BS 4142 assessment, it is necessary to compare the measured external background sound level (i.e. the $LA_{90,T}$ level measured in the absence of plant items) to the rating level ($L_{Ar,T}$) of the various plant items when operational. Where sound emissions are found to be tonal, impulsive, intermittent, or exhibit other sound characteristics that are readily distinguishable against the residual acoustic environment, BS4142 advises that penalties be applied to the specific level to arrive at the rating level.

The subjective method for applying a penalty for tonal sound characteristics outlined in BS 4142 recommends a 2dB penalty for a tone just perceptible at the receptor, a 4dB penalty for one clearly perceptible, and a 6dB penalty for one highly perceptible. For intermittency, BS 4142 recommends that if it is readily distinguishable from the residual acoustic environment, a penalty of 3 dB can be applied. The following definitions, as discussed in BS 4142, are summarised below:

Ambient sound level, $LA_{eq,T}$: This is the equivalent continuous A-weighted sound pressure level of the totally encompassing sound in a given situation at any given time, usually from many sources near and far, at the assessment location over a given time interval, T.

Residual sound level, $LA_{eq,T}$: This is the equivalent continuous A-weighted sound pressure level of the residual sound (i.e. ambient sound remaining at the assessment location when the specific sound source is suppressed to such a degree that it does not contribute to the ambient sound) at the assessment location over a given time interval, T.

Specific sound level, $LA_{eq,T}$: This is the equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, T_r .

Rating Level, L_{ArT}: specific sound level plus any adjustment for the characteristic features of the sound.

Background sound level, L_{A90,T}: A-weighted sound pressure level exceeded by the residual sound at the assessment location for 90% of a given time interval, T, measured using time weighting F and quoted to the nearest whole number of decibels.

The basis of the BS4142 approach is to determine the specific sound characteristics and correct them to choose a rating level. The difference between the Rating Level (L_{ArT}) and the Background Level (L_{A90}) is then used to determine the likely impact, which depends on context.

The potential outcomes arising from the BS4142 assessment are as follows:

- Typically, the greater this difference, the greater the magnitude of the impact.
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

The lower the rating level relative to the measured background sound level, the less likely the specific sound source is to have an adverse or significant impact. Where the rating level does not exceed the background sound level, this indicates the specific sound source has a low impact, depending on the context.

10.3.5 Cork Agglomeration - Noise Action Plan 2024~2028

The current Noise Action Plan for the Cork Agglomeration deals with the fourth round of noise action planning for the Agglomerations. The current Noise Action Plan (NAP) reports the findings of the strategic noise mapping prepared in consultation with Transport Infrastructure Ireland (TII), Irish Rail (Iarnród Éireann), and the Environmental Protection Agency (EPA), and in respect of the calendar year 2021 for noise from the following sources:

- Road traffic
- Rail traffic
- Airports
- Industrial activity sites, including ports.

Airports – all airports and major airports (airports with more than 50,000 movements per year (a movement being a take-off or a landing), excluding those purely for training purposes on light aircraft). The proposed operations will not meet the threshold requirements for inclusion in the Cork Agglomeration Noise Action Plan, as aircraft movements are not expected to exceed 50,000 per year.

10.4 The Existing and Receiving Environment (Baseline Situation)

The Rathcoole Aerodrome is approximately 7.3km Northeast of Mill Street, Cork. It is relatively rural but near the heavily trafficked R583 on the northeastern side of the site. The Aerodrome can be accessed from three different directions. The lands around the facility are primarily

agricultural. While residential receptors are near the site, noise has been assessed at key residential receptors surrounding the Aerodrome.



Figure 10-1 Aerial photo showing the location of Rathcoole Aerodrome and surrounding features (Google Maps).

10.4.1 Key Receptors Assessed

Baseline noise surveys have been conducted at locations representative of the nearest residential receptors in areas that are potentially impacted by construction works and are likely to be affected during the operational phase of the Proposed Development. Unattended survey locations are set out in Table 10-3 below.

Table 10-3: Key residential receptors surrounding the existing Aerodrome were analysed.

	Eircode	Address	Latitude	Longitude
Location A	P51T9PK	Killetragh, Dromagh, Mallow, Co. Cork.	52.110033	-9.0055020
Location B	P51VY47	Dromahoe, Dromagh, Mallow, Co. Cork.	52.109074	-8.9868915
Location C	P51FWP9	Rathcool House, Rathcool, Mallow, Co. Cork.	52.104456	-8.9757979
Location D	P51VP80	Knockcahill House, Knockcahill, Rathcool, Mallow, Co. Cork.	52.101286	-8.9857838



Figure 10-2: Study areas surrounding the site, considering residential receptors on its west, north, east, and southern sides (Source: Google Maps).

Table 10-4: Key residential receptor distances from the aerodrome boundaries

	Eircode	Address	Distance (m)
Location A	P51T9PK	Killetragh, Dromagh, Mallow, Co. Cork.	1340m Northwest
Location B	P51VY47	Dromahoe, Dromagh, Mallow, Co. Cork.	346m North
Location C	P51FWP9	Rathcool House, Rathcool, Mallow, Co. Cork.	521m Southeast
Location D	P51VP80	Knockcahill House, Knockcahill, Rathcool, Mallow, Co. Cork.	316m South

10.4.2 Noise & Vibration Impacts Assessed

As part of our study, we examine the impact of four noise sources:

1. Existing and proposed aircraft traffic associated with the Aerodrome is part of its current and permitted use. For clarity, the 'Aerodrome' refers to the overall site, and includes the operations of the Rathcool Flying Club and/or the HSE Air Ambulance.
2. The likely noise arising from the continued use of a HEMS helicopter, which includes the provision of a service at the Rathcoole Aerodrome.
3. Ground noise is associated with the use of an emergency helicopter service at Rathcoole Aerodrome.
4. Assessment of the likely level of construction noise for the project. This study considers four phases of construction. Construction activities were assessed against the noise limit criteria in BS 5228-1:2009+A1:2014 at six residential receptor locations.

It is important to note that the proposed runway extension is solely a safety measure for existing and future aircraft and is not intended to accommodate larger aircraft. Therefore,

no specific noise impacts are associated with the extended runway. However, moving from a grass to a hard surface runway is expected to reduce take-off noise.

10.4.3 Measurement Instrumentation Details-Noise

Table 10-5: Details of instrumentation used at all noise monitoring locations.

Description	Location A	Location B	Location C	Location D	Handheld	Field Calibrator
Instrument Type:	Nti Audio XL-2	Nti Audio XL-2	Nti Audio XL-2	Nti Audio XL-2	Nti Audio XL-XL-2	B&K Type 4231
Instrument Serial Number:	A2A-10976-E0	A2A-16940-E0	A2A-11106-E0	A2A-19921-E0	A2A-21399-E0	2499109
Calibration Certificate	NSAI 213146	NSAI 214147	NSAI 224634	NTI – 44498	NTI – UK-23-080	NSAI 224633
Calibration Level:	94dB	94dB	94dB	94dB	94dB	N/A
Post-measurement calibration.:	93.9dB	94dB	93.9dB	94dB	94dB	N/A

A Davis-Pro weather station was installed at the Aerodrome to log weather conditions throughout the 24-hour survey. The weather data has been provided in Appendix 10-4.

10.4.4 Baseline Noise Study at Location A -Eircode P51T9PK

This location is approximately 1400m West/Northwest of the Aerodrome runway centreline in a rural area surrounded by farmlands. Weather conditions and data from the installed local weather-logging station were optimal throughout the survey. The measurements in Table 10-6 include fixed-wing aircraft and Helicopter Emergency Medical Service (HEMS) movements.

Table 10-6: Summary of the measured levels at Eircode P51T9PK

Periods	Parameter	Measured
Daytime period	LAeq,16hr	44.2dB
Nighttime period	LAeq,8hr	39.2dB

Appendix 10-1 shows detailed measurements for Eircode P51T9PK

10.4.5 Baseline Noise Study at Location B -Eircode P51VY47

This location is approximately 400m north of the Aerodrome runway centreline in a rural area surrounded by farmland. Weather conditions and data from a locally installed weather logging station were ideal throughout the survey. The measurements in Table 10-7 include fixed-wing aircraft and Helicopter Emergency Medical Service (HEMS) movements.

Table 10-7: Summary of the measured levels at Eircode P51VY47

Periods	Parameter	Measured
Daytime period	LAeq,16hr	45.7dB
Nighttime period	LAeq,8hr	36.4dB

Appendix 10-1 shows detailed measurements for Eircode P51VY47

10.4.6 Baseline Noise Study at Location C -Eircode P51FWP9

This location is west of the runway. The measurement point was 200m south of the Aerodrome runway centreline in a rural area surrounded by farmland. The residential property on this site sits 470m south of the runway centre line. Weather conditions and data from a locally installed weather-logging station were optimal throughout the survey. The measurements in Table 10-8 include fixed-wing aircraft and Helicopter Emergency Medical Service (HEMS) movements.

Table 10-8: Summary of the measured levels at Eircode P51FWP9

Periods	Parameter	Measured
Daytime period	LAeq,16hr	48.3dB
Nighttime period	LAeq,8hr	34.3dB

Appendix 10-1 shows detailed measurements for Eircode P51FWP9

10.4.7 Baseline Noise Study at Location D -Eircode P51VP80

This location is south of the runway. The measurement point was 400m south of the Aerodrome runway centreline in a rural area surrounded by farmland. Weather conditions and data from a locally installed weather logging station were ideal throughout the survey. The measurements in Table 10-9 include fixed-wing aircraft and Helicopter Emergency Medical Service (HEMS) movements.

Table 10-9: Summary of the measured levels at Eircode P51VP80

Periods	Parameter	Measured
Daytime period	LAeq,16hr	40.6dB
Nighttime period	LAeq,8hr	33.1dB

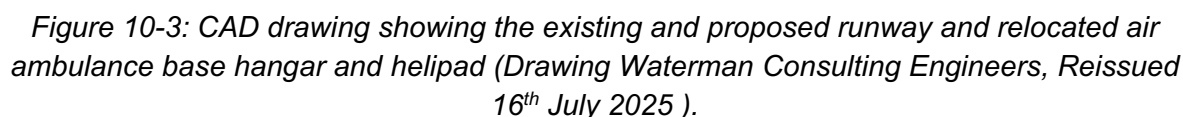
Appendix 10-1 shows detailed measurements for Eircode P51VP80

10.5 Characteristics of the Proposed Development

The Proposed Development includes a hard-surfaced runway, taxiway, and helipad, along with associated ground-level lighting, interceptors, and relocation of the existing hangar. The paramedic and crew prefab bases are all related to the Irish Community Air Ambulance, which has a new proprietary wastewater treatment system, a new vehicle entrance, and associated site works will be serviced.

It is proposed that the improved runway continue to provide the same service as a club aerodrome. Additionally, the runway will be used for flight training and is frequently used by students practising circuits, as well as the helicopter emergency medical service.

The Proposed Development is located on the southern side of the River Blackwater. At present, there is a grass-covered east-west runway. It includes constructing a hard-surface runway and taxiway, and relocating an air ambulance base, hangar, and helipad west of the current location, which will serve as a hangar and helipad for the helicopter emergency medical service operated from the facility.



10.6 Potential Impact of the Proposed Development

The significance attributed to effects can be a central issue when the findings of an EIAR are scrutinised, for example, during an appeal to An Bord Pleanála (An Coimisiún Pleanála) of a contested development application. The significance of effects is usually understood to mean the importance of the outcome of the impact (the consequences of the change). Significance is determined by combining (objective) scientific and subjective (social) concerns.

10.6.1 Operational- Describing the Significance of Effects

Using the guidance provided in the EPA's *Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR)*, published in May 2022, we can utilise the classified description of effects. 'Significance' is a concept that can have different meanings across topics; in the absence of specific definitions for other issues, the following definitions may be helpful (also see *Determining significance*) for assessing noise impact or noise change.

The EPA published *Guidelines on the information to be contained in Environmental Impact Assessment Reports* in May 2022.

Table 10-10: Description of Effects (EPA 2022)

Description of Effect	Describing the Significance of Effects
Imperceptible	An effect capable of measurement but without significant consequences.
Not Significant	This effect 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.

Duration can have different meanings across topics; in the absence of specific definitions, the following may be useful.

Table 10-11: Describing the Duration of Environmental Effects (EPA 2022)

Description of Duration	Definition
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).

10.6.2 Construction Phases

At the time of writing, Waterman Consulting Engineers had prepared an outline of the Proposed Development's construction and environmental management plan (CEMP). Note that this is an Outline Construction and Environmental Management Plan. Ordinarily, the appointed main contractor would be the lead contributor to the Construction Management Plan.

The construction programme is expected to generate typical construction-related noise on site. During the construction phase of the proposed development, various plant items will be in use, including excavators, lifting equipment, dump trucks, compressors, and generators.

British Standard BS 5228 – 1: 2009+A1:2014

Potential noise impacts during a project's construction stage are often assessed in accordance with BS 5228. The following paragraphs discuss various mechanisms used to illustrate recommended threshold values for determining whether an impact is occurring.

Potential Significance Based on Noise Change - ABC Method

The approach adopted here requires designating a Noise Sensitive Location into a specific category (A, B, or C) based on the existing ambient noise levels in the absence of construction noise. This then sets a threshold noise value that, if exceeded at this location, indicates a potentially significant noise impact is associated with the construction activities, depending on context. Figure 10-4 below outlines the values that indicate a potentially substantial effect at the façades of residential receptors when exceeded.

Assessment category and threshold value period	Threshold value, in decibels (dB) $\{A\}$ ($L_{Aeq,T}$) $\{A\}$		
	Category A ^{A)}	Category B ^{B)}	Category C ^{C)}
Night-time (23.00–07.00)	45	50	55
Evenings and weekends ^{D)}	55	60	65
Daytime (07.00–19.00) and Saturdays (07.00–13.00)	65	70	75

NOTE 1 A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.

NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise. $\{A\}$

NOTE 3 Applied to residential receptors only.

^{A)} Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

^{B)} Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

^{C)} Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

^{D)} 19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.

Figure 10-4: Potential Significance Based on Noise Change - ABC Method

The proposed general construction hours are 7:00 a.m. to 6:00 p.m., Monday through Friday, and 8:00 a.m. to 2:00 p.m. on Saturdays. Occasional weekday evening works may also be required; however, evening activities will be significantly reduced to appropriately manage any associated noise impacts, and more stringent construction noise criteria will apply during any evening work. As a result, noise emissions from evening activities are expected to be significantly lower than for other general daytime activities.

Due to the nature of daytime activities on a construction site, there is potential for significant noise levels. The flow of vehicular traffic to and from a construction site can also contribute to relatively high noise levels. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces. Due to the considerable separation distances between the construction works and the required site works, there is little likelihood of structural or cosmetic damage to neighbouring dwellings resulting from vibration. There are very substantial distances between the proposed works and vibration-sensitive residential properties in the vicinity of the development.

As the construction programme has not been fully developed, it is difficult to calculate the magnitude of noise emissions to the local environment. However, it is possible to predict typical noise levels using the guidance in BS 5228-1. In Table 10-12 below, we have outlined specific plant items and the anticipated noise levels for various phases of the construction programme. We have assumed that standard good-practice measures for controlling noise from construction sites will be implemented during the assessment.

Table 10-12: Typical noise levels associated with Construction Plant Items (BS5228-1)

Phase	Item of Plant (BS 5228-1 Ref.)	Construction Noise Level at 10m Distance, (dB $L_{Aeq,1hr}$)
	Wheeled Loader Lorry (C2 28)	74

1 – Site preparation	Track Excavator (C2 22)	72
	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
2 – Runway /Taxiway Foundations	Tracked Excavator (C3.24)	74
	Concrete Pump (C3.25)	78
	Compressor (C3 19)	75
	Vibratory Roller (Drum Compactor)	80
3 – General Construction	Surfacing Machine	78
	Hand tools	81
	Pneumatic Circular Saw (D7.79)	75
	Vibratory Roller	80
4 – Landscaping	Dozer (C2.13)	78
	Dump Truck (C4.2)	78
	Surfacing (D8.25)/Grader	68

Table 10-13 below shows the predictions regarding site preparation works. The results from all other modelled scenarios have been considered for runway taxi foundations, general construction, and landscaping. It is worth noting at the outset that there are significant separation distances between the site and the nearest residential receptors, which are most effective at mitigating noise.

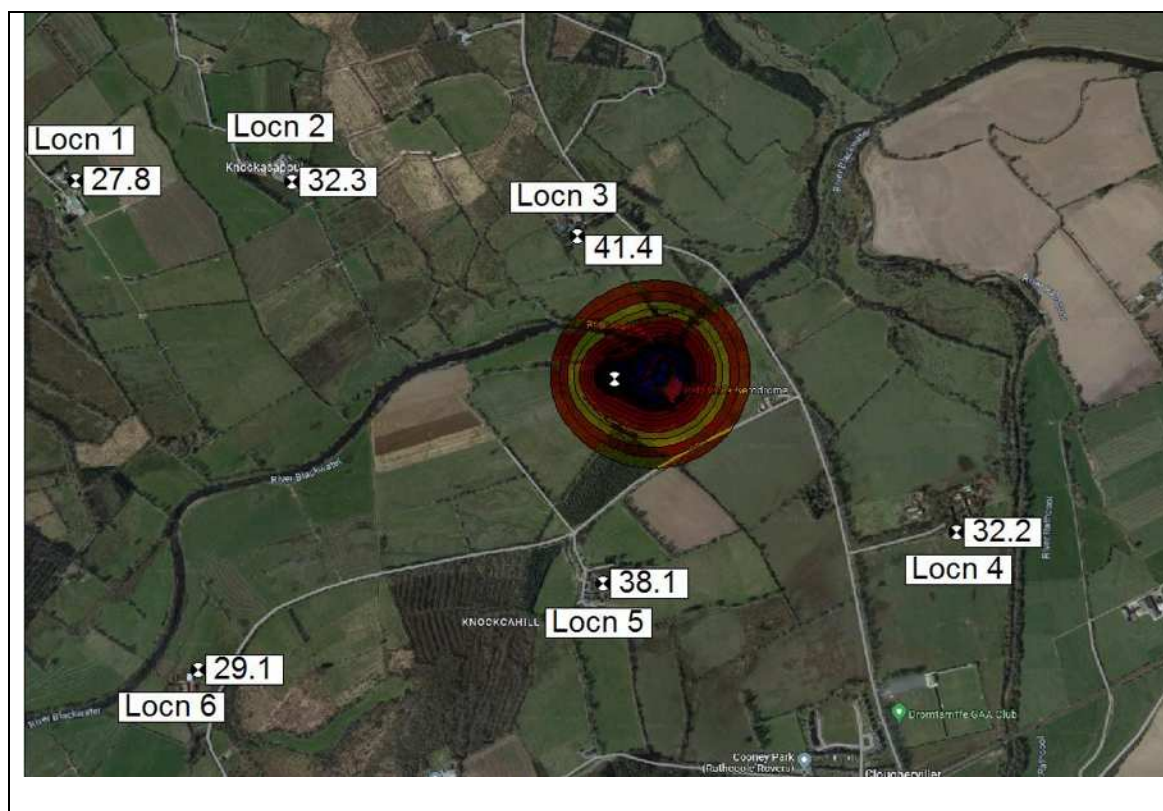


Figure 10-5: Noise contour map showing the predictions associated with site preparation out to 55dB(A).

Table 10-13: Below, a range of construction noise levels for different construction activities at the various noise assessment locations is presented.

Residential Re- ceptors	Predicted Construction Noise Level for Various Phases dB LAeq,1hr			
	Site Prepara- tion	Founda- tions	General Construc- tion	Landscap- ing
Location 1	28dB, LAeq,1hr	36dB, LAeq,1hr	38dB, LAeq,1hr	35dB, LAeq,1hr
Location 2	32dB, LAeq,1hr	40dB, LAeq,1hr	42dB, LAeq,1hr	40dB, LAeq,1hr
Location 3	41dB, LAeq,1hr	49dB, LAeq,1hr	50dB, LAeq,1hr	45dB, LAeq,1hr
Location 4	32dB, LAeq,1hr	41dB, LAeq,1hr	43dB, LAeq,1hr	38dB, LAeq,1hr
Location 5	38dB, LAeq,1hr	48dB, LAeq,1hr	50dB, LAeq,1hr	48dB, LAeq,1hr
Location 6	29dB, LAeq,1hr	38dB, LAeq,1hr	40dB, LAeq,1hr	38dB, LAeq,1hr

The indicative construction noise prediction values are within the criterion of 70 dB LAeq,1hr for weekdays. A complete Construction Noise Management Plan has been prepared for the Proposed Development. There are no construction activities that would be expected to give rise to noise construction levels that would be considered out of the ordinary or in excess of the levels outlined in Table 10-13 above. The expected construction noise impacts have been shown in Table 10-14 below.

Table 10-14 Review of Potential Daytime Construction Noise Impacts (slight, moderate, significant)

Ref.	Predicted Construction Noise Impacts for Various Phases dB LAeq,1hr			
	Site Preparation	Foundations	General Construc- tion	Landscaping
Location 1	Slight	Slight	Slight	Slight
Location 2	Slight	Slight	Slight	Slight
Location 3	Slight	Moderate	Moderate	Slight
Location 4	Slight	Slight	Slight	Slight
Location 5	Slight	Moderate	Moderate	Slight
Location 6	Slight	Slight	Slight	Slight

Haulage Routes

Waterman Consulting Engineers has prepared an outline Construction and Environmental Management Plan (CEMP) to support the Proposed Development at Rathcoole Aerodrome,

Rathcool, Co. Cork. As part of this process, a detailed review of access, egress, and traffic management requirements has been undertaken.

A key component of the assessment focuses on the volume and frequency of construction traffic expected during the earthworks phase, specifically the transport of fill material to the site. Based on current estimates, the transport operation will be completed using four rigid trucks operating on a daily cycle.

If each of the four trucks averages 30 return trips per day (i.e., approximately 7–8 runs per truck), the total quantity of required fill material is expected to be delivered within approximately 32 working days. This calculation provides an indicative timeline to support project planning, traffic management measures, and stakeholder communication.

Appropriate mitigation—including scheduling deliveries outside peak traffic hours, using designated haul routes, and implementing on-site traffic control—will be implemented to minimise impact on the surrounding road network and the local community. The proposed haulage route for HGVs is shown in Figure 10-6 below.

Table 10-15: Construction Traffic Estimate Summary

Parameter	Value / Description
Number of rigid trucks	4
Total truck runs per day (combined)	~30 runs/day
Average runs per truck	~7–8 runs/day
Estimated duration for transporting all fill material	~32 working days
Purpose of transport	Delivery of fill material to the site
Key considerations	Access/egress management, haul route planning, traffic mitigation measures

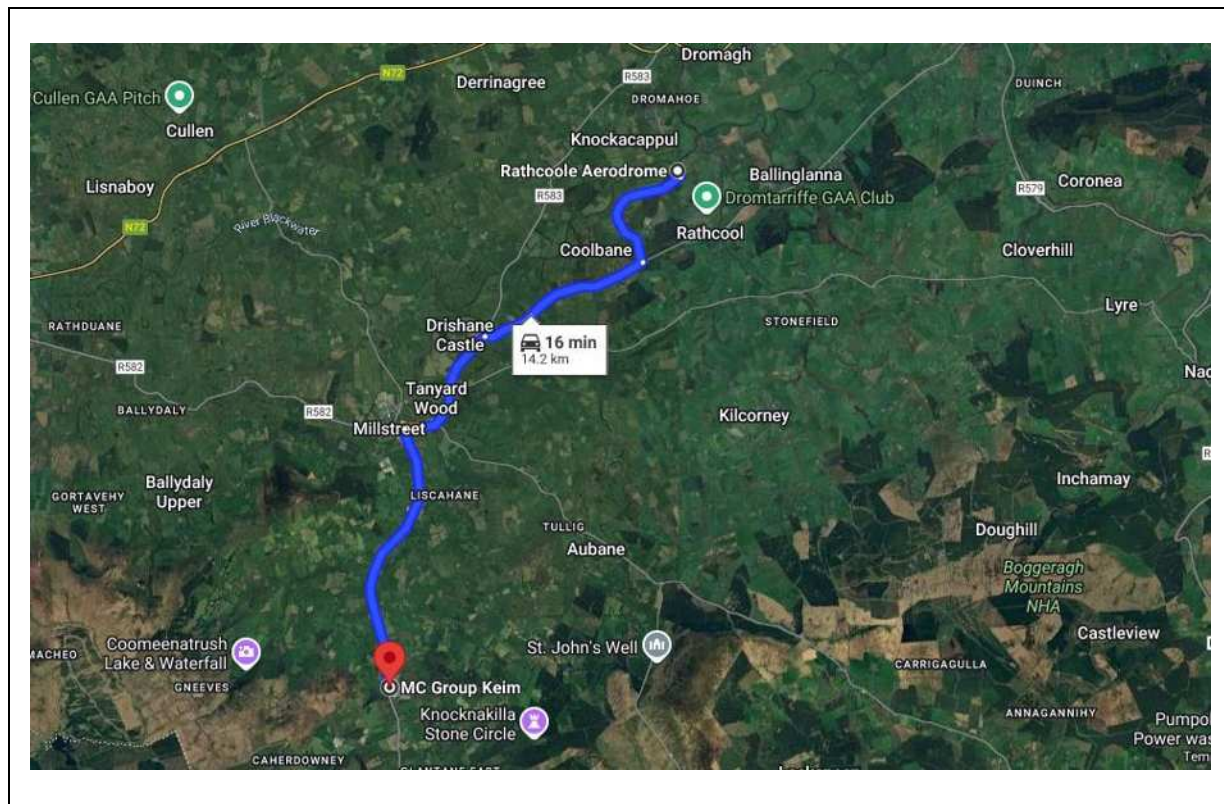


Figure 10-10-6: Showing the proposed haulage route considered for HGVs

10.6.3 Operational Phase

Runway Change of Heading

The existing runway, 'Runway 08-26,' will change by 10 degrees to 'Runway 07-25,' as shown in Figure 10-7 below. This change in direction will have three key benefits: (1) increased landing and take-off distances, (2) better orientation to take advantage of the prevailing south-westerly winds, and (3) further separation of flight path distances from departure and landing tracks.



Figure 10-10-7: Showing the proposed runway heading change of -10° between the existing and proposed arrangement at the Rathcoole Aerodrome (Cathal O'Meara Landscape Architects, 16/06/2025).

Considering the current runway centreline, Runway 08-26', aircraft can approach or depart circa 530m from a residential receptor on the site's Eastern side (Eircode P51WY83). The new runway orientation, 'Runway 07-25', will increase the runway centreline separation distance to the residential property (Eircode P51WY83) to 665m. The predicted benefit has been calculated and shown in Table 10-16 below. Predictions indicate that this will immediately reduce by 2dB(A) through increased separation distance. This heading change will likely result in a marginal reduction in landing and departure noise at this location.

Table 10-16 The predicted benefit associated with the change in orientation of the existing 'Runway 08-26' to 'Runway 07-25'.

Residential Receptor	Existing distance from the Centerline/Aircraft	New distance from Centerline/Aircraft	Noise attenuation (reduction)
Eircode P51WY83	528m	665m	2dB(A)

Air Traffic Noise Criteria

There is no statutory Irish guidance relating to aircraft noise exposure levels. In the absence of such guidance, reference is made to UK guidance. In the UK, The Government's current policy on aviation noise is to limit and, where possible, reduce the number of people significantly affected by noise through a "balanced approach" of identifying the noise problem at an airport and then assessing the cost-effectiveness of the various measures available to address that with quieter aircraft, quieter operational procedures, operating restrictions, and land-use planning which the Framework underlines are the responsibility of LPAs.

The UKs, ProPG suggests in its introduction that it is acknowledged that the onset of significant community annoyance at approximately 57dB LAeq,16h; the framework does not, however, expect airport operators to offer acoustic insulation to noise-sensitive buildings, such as schools and hospitals, unless exposed to levels of noise of at least 63 dB LAeq,16h or to offer assistance with the costs of moving to households exposed to levels of noise less than 69 dB LAeq,16h. The Aviation Policy Framework should be formally recognised in relevant Local Development Plans, and local policies should be developed to address the issues raised.

Increased Operational Flight Movement

It was stated previously in the McCutcheon Halley Planning Statement that over the past 3 years, there have been approximately 250 visiting aircraft per annum landing at the site (non-members of the Rathcool Flying Club). It should be noted that visiting movements are included in the Table of average movements for the Flying Club over the past 3 years and have been incorporated into the projected movements (following the upgrade, plus 5 years from commencement). Currently, it is the case that visiting aircraft (non-members of the Flying Club) account for approximately 25% of flight movements for the Flying Club. It is not anticipated that this percentage will change significantly following completion of this development.

It is understood that the planning statement indicates that the use of the Aerodrome at Rathcool Flying Club will increase by approximately 1,940 flight movements per annum by the year 2029.

Table 10-17: Showing the average movements per month over the last three years at the existing Rathcool Flying Club

Average Movements Per Month over the past 3 years													
Historic Flight Movements	J	F	M	A	M	J	J	A	S	O	N	D	Total
Flying Club Movements	187	117	158	236	198	184	162	248	170	114	66	70	1910
Air Ambulance Movements	44	45	71	58	56	64	65	64	42	46	32	36	623
Total Movements	231	162	229	294	254	248	227	312	212	160	98	106	2533

Table 10-18: Showing the projected movements per month following the upgrade +5years from commencement

Projected Movements Per Month following upgrade +5years from commencement													
Projected Flight Movements in 2029	J	F	M	A	M	J	J	A	S	O	N	D	Total
Flying Club Movements	308	308	308	423	346	346	308	385	346	308	231	231	3848

Air Ambulance Movements	47	46	74	59	58	67	67	66	45	50	35	37	651
Total Movements	355	354	382	482	404	413	375	451	391	358	266	268	4499

Table 10-19: Showing the projected likely increase in noise level monthly, based on +5years from commencement.

Likely increase in noise level following upgrade +5 years from commencement.													
Monthly Increase	J	F	M	A	M	J	J	A	S	O	N	D	Total
Predicted noise change (dB(A)).	1.9	3.4	2.2	2.1	2.0	2.2	2.2	1.6	2.7	3.5	4.3	4.0	2.5

It should be noted, however, that the change in runway heading is likely to result in a -2dB noise reduction at Eircode P51WY83.

Noise impact of the year 2029

Flight movements at the Flying Club are forecast to increase by approximately 1,940 movements per annum by 2029, while Air Ambulance activity is expected to remain broadly consistent with current operational patterns. This Chapter assesses potential changes in noise levels associated with the projected increase in flight movements in the 2029 assessment year.

A commonly used relationship is the **logarithmic change in noise level with the number of events**.

If all aircraft movements or vehicle pass-bys are assumed to be acoustically similar, the change in noise level is given by:

$$\Delta L = 10 \log_{10} \left(\frac{N_2}{N_1} \right)$$

where:

- ΔL = change in noise level (dB)
- N_1 = initial number of movements / pass-by events
- N_2 = new number of movements / pass-by events

Key implications:

- Doubling the number of movements **+3 dB**
- Halving the number of movements **-3 dB**
- Tenfold increase **+10 dB**

This formula is widely used in aircraft noise assessment and road traffic noise studies to compare changes in activity levels under otherwise similar conditions.

Table 10-20: Showing the projected likely increase in noise level monthly, based on +5years from commencement.

Annual figures are measured and estimated	Annual flight movements
Annual average flight movements based on three years of observation.	2533
Expected annual average flight movements <i>following the upgrade + 5years from commencement</i>	4499
Increase	1966
At any residential observation point, the likely increase in noise has been quantified.	+ 2.5dB

Based on this analysis, we can conclude that the likely increase in noise level five years from commencement will be approximately +2.5 dB. This represents only a moderate change in noise level. In assessing the degree of noise change, this increase is not considered significant for evaluating the effect size. While the change will be permanent, it will not be appreciable.

10.7 Extension of the Runway

It is essential to clarify that the extension, resurfacing or lengthening of a runway does not result in increased aircraft noise. The proposed runway extension and resurfacing of the existing runway at Rathcool are solely for safety purposes, providing increased take-off and landing distances. There is no proposal to change the type or classification of aircraft currently using the existing runway.

In addition, a longer runway provides greater safety margins during landing, allowing aircraft to decelerate and brake more safely after touchdown. This enhanced stopping distance contributes directly to safer aircraft operations, particularly in variable or adverse conditions. It is well recognised that STOL (Short Take-Off and Landing) runways typically generate more noise than longer runways, as aircraft must operate at higher power settings over shorter distances.

Furthermore, it is proposed that the existing grass runway will be upgraded to a tarmac surface. This change alone provides a significant operational benefit. Due to tarmac's lower rolling resistance than grass, aircraft typically require up to 20% less engine power during take-off. As a result, aircraft do not need to apply the same level of engine power to overcome runway resistance/drag and achieve take-off speed.

This reduction in required engine power has clear noise-reduction benefits, particularly during departures and other flying club activities. The combined effect of a longer runway and a hard surface, therefore, supports both enhanced safety and reduced noise output.

It must be stated definitively that the proposed proportionate increase in runway length of 140 metres, together with the surface upgrade, is purely for safety and operational efficiency. It is not intended, nor will it allow the introduction of larger aircraft or aircraft of a different classification to the Aerodrome. Aircraft operations will remain consistent with those currently using the runway, and the proposal will not alter the nature or scale of aviation activity at Rathcool. This point is fundamental to a clear understanding of the application.

Cork Agglomeration -Noise Action Plan 2024~2028

The European Communities (Environmental Noise) (Amendment) Regulations 2021 (S.I. 663/2021) sets out the assessment methods for harmful effects, which consider ischemic heart disease (IHD), high annoyance (HA) and high sleep disturbance (HSD).

Ischemic heart disease is calculated for road traffic noise only, whereas high annoyance and high sleep disturbance are calculated for road traffic, railway and aircraft noise. The exposure of harmful effects is assessed independently for each source. When the same people are simultaneously exposed to different noise sources, the harmful effects may not generally cumulate; however, they can be compared to identify proportional significance. The method assesses harmful effects on the population within an assessment area rather than the potential health effects at a specific building or location. Whilst the Regulations set out the equations to be used for calculating harmful effects, it does not define noise thresholds above which health effects should be calculated, nor does it stipulate the assessment bands that should be used (0.1 dB, 1 dB or 5 dB); these have been provided by the EPA, and are as follows:

- The calculations for harmful effects should be undertaken in 1 dB assessment bands
- The assessment of harmful effects should be undertaken above the following thresholds:

Table 10-21 Assessment of harmful effects from Road, Rail and Aircraft noise as defined in the Cork Agglomeration -

Noise Action Plan 2024~2028.

Assessment of harmful effects	Lden	Lnight
Road Traffic Noise	53dB	45dB
Railway Noise	54dB	44dB
Aircraft Noise	45dB	40dB

- Road traffic noise: 53 dB Lden, 45 dB Lnight
- Railway noise: 54 dB Lden, 44 dB Lnight
- Aircraft noise: 45 dB Lden, 40 dB Lnight

Harmful effects have therefore been calculated from population exposure statistics in 1 dB bands for the noise level thresholds outlined above, using the calculation methodology specified in the Regulations.

Population Exposure to Noise -Noise Action Plan 2024~2028

The most prevalent noise source within the Cork agglomeration is from road traffic sources, where (rounded to the nearest 100) there is a total of 95,400 people in dwellings exposed to road traffic noise greater than, or equal to, 55 dB Lden (in comparison to 1,200 people from railway sources,

2,700 from industry sources and zero from aircraft sources. This trend is also reflected in the total population exposed to levels greater than or equal to 50 dB Lnight.

The percentage of the total population in dwellings within the Cork agglomeration that are exposed to noise levels greater than, or equal to, 55 dB Lden from each source are:

- 44% for road traffic source
- 1% for railway sources
- 1% for industrial sources
- 0% for aircraft sources

The percentage of the total population in dwellings within the Cork agglomeration that are exposed to noise levels greater than, or equal to, 50 dB Lnight from each source are:

- 13% for road traffic source
- less than 1% for railway sources
- 1% for industrial sources
- 0% for aircraft sources

The Cork Agglomeration Noise Action Plan 2024~2028 suggests that there are no people in dwellings who are exposed to levels equal to or exceeding the highest noise band (greater than or equal to 75 dB Lden and greater than or equal to 70 dB Lnight) for railway, industry or airport sources.

Survey of Noise Attitudes 2014: Aircraft Noise and Annoyance, Second Edition (CAP 1506)

In the UK, the LAeq 16-hour was adopted in 1990 to assess aircraft noise. At that time, the UK government defined three threshold levels for policy consideration: 57dB, 63dB, and 69 dB LAeq, with 16h representing low, moderate, and high annoyance. In the 2003 Air Transport White Paper, 57 dB LAeq,16h was defined as marking the approximate onset of significant community annoyance, a definition reaffirmed in the Government's 2013 Aviation Policy Framework.

The findings of the Survey of Noise Attitudes study commissioned by the Department for Transport (UK) indicated that the degree of annoyance (based on the % of respondents who were highly annoyed) previously occurred at 57 dB LAeq,16h, and now occurs at 54 dB LAeq,16h. The research also showed that some adverse annoyance effects can occur at 51dB LAeq, 16 h.

Using modern noise analysis software that utilises the site measurement data, the specific aircraft noise level at each location has been quantified, as shown in Table 10-22 below. The aircraft noise contribution has been quantified at the closest receptors to the Rathcoole Aerodrome.

Table 10-22 Assessment and contrasting specific aircraft noise against Survey of Noise Attitudes 2014: Aircraft Noise and Annoyance, Second Edition (CAP 1506), by the Civil Aviation Authority (adopted from the UK 1990 thresholds for policy consideration). Guidance suggests that LAeq, 16-hour = 57dB represents low annoyance.

	All Aircraft Noise, including fixed-wing and rotary craft that use Rathcoole Aerodrome	Assessment related to aircraft noise levels that are likely to cause low annoyance (NAS)	Assessment related to aircraft noise levels that are likely to cause moderate annoyance (NAS)
Location A: Eircode P51TPK	L _{Aeq} , 16-hour = 44.2 dB	Some 13dB lower than a level that would represent low annoyance.	Some 19dB below a level that would represent moderate annoyance.
Location B: Eircode P51VY47	L _{Aeq} , 16hour=45.7dB	Some 11dB lower than a level that would represent low annoyance.	Some 17dB below a level that would represent moderate annoyance.
Location C: Eircode P51FW9P, measured 210m from the runway centerline, with the residential property 530m from the same centerline.	L _{Aeq} , 16-hour = 48.3 dB Corrected for distance (-8dB) L _{Aeq} , 16hour=40dB	Some 17dB lower than a level that would represent low annoyance.	Some 23dB below a level that would represent moderate annoyance.
Location D: Eircode P51VP80	L _{Aeq} , 16-hour = 40.6 dB	Some 16.4dB lower than a level that would represent low annoyance.	Some 22.4dB below a level that would represent moderate annoyance.

10.7.1.1 Change in noise climate from increased Aerodrome Traffic.

Based on the existing activity and the projected likely increase in noise level following the upgrade, +5 years from commencement.

Table 10-23 Noise change based on the expected growth in aircraft.

	Daytime Aircraft Traffic with HEMS activity	+5 years growth	Expected daily noise level after +5 years of growth.
Location A: Eircode P51TPK	L _{Aeq} , 16-hour = 44.2 dB	+2.5dB	L _{Aeq} =16hour =46.7dB
Location B: Eircode P51VY47	L _{Aeq} , 16hour=45.7dB	+2.5dB	L _{Aeq} =16hour =48.2dB
Location C: Eircode P51FW9P, measured at 210m from runway centerline and property at 530m.	L _{Aeq} , 16-hour = 48.3 dB Corrected for distance (-8dB) L _{Aeq} , 16hour=40dB	+2.5dB	L _{Aeq} =16hour =42.5dB

	Daytime Aircraft Traffic with HEMS activity	+5 years growth	Expected daily noise level after +5 years of growth.
Location D: Eircode P51VP80	LAeq, 16-hour = 40.6 dB	+2.5dB	LAeq=16hour =43dB
Location A: Eircode P51TPK	LAeq, 16-hour = 44.2 dB	+2.5dB	LAeq=16hour =46.7dB

10.7.2 Potential Cumulative Impacts

Having conducted a comprehensive study of the existing and proposed noise climate at Rathcoole Aerodrome, we can now provide a definitive response to the Further Information Request raised by Cork County Council. Having given due regard to the Local Authority's further information request, we can now respond to all matters raised therein. Our findings and results are as follows:

A comprehensive baseline study has been conducted at four residential locations located east, north, east, and south of the site. Three of the locations represent the closest points on the northern, eastern, and southern sides of the site. The baseline noise climate is typical of rural environments. Location B is closest to a local road on its eastern side. It should be noted that the rural noise climate in the absence of aircraft noise can include notable contributions from agricultural vehicles on the road, road traffic, and occasional motorbike or modified-car events.

Measurements were conducted of individual noise events generated by aircraft that typically use the Rathcoole Aerodrome. Contrasting each aircraft's noise contribution has been possible, thereby putting it into context (expressed as LAeq). It should be noted that a Cessna 172 Aircraft could fly 10~15 go-arounds when training, whilst the HEMS helicopter typically includes up to three call outs per day. The Cessna 172 is the most frequently used aircraft at the Aerodrome. The HEMS helicopter's most significant noise contribution is approximately 8dB(A) quieter than that of a Diamond twin-engine fixed-wing aircraft.

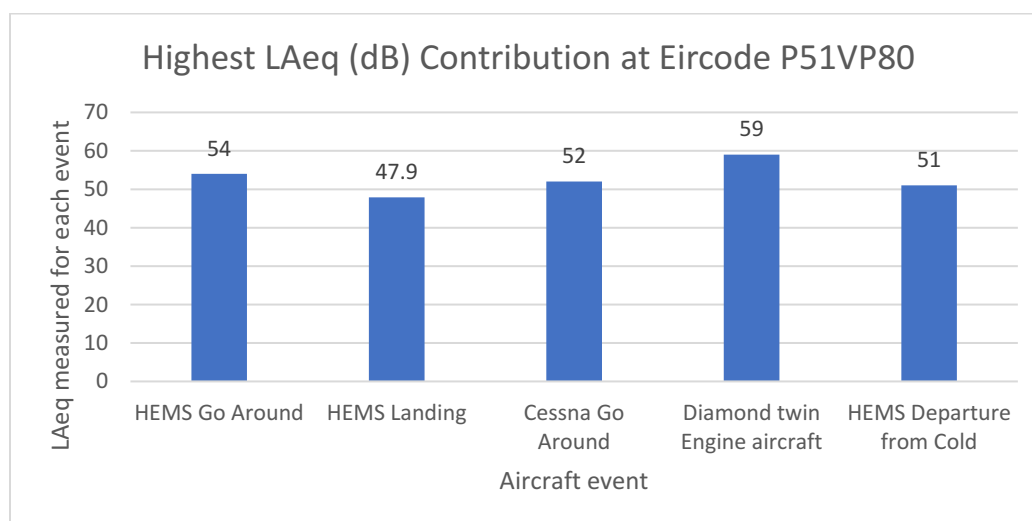


Figure 10-8 Contrasting aircraft that use the Rathcoole Aerodrome, concerning the closest residential property on the southern side of the site.

In terms of perceived loudness, the HEMS helicopter is roughly half as loud as a twin-engine aircraft event at the Aerodrome and only 1~2 dB(A) louder than a Cessna C172 training aircraft. It should be noted that a Cessna C172 is likely to generate multiple events over a typical day at the Aerodrome, whilst the HEMS helicopter is limited to medical emergencies.

As part of our noise impact assessment, we measured and quantified the likely noise increase in noise levels at four key noise receptors on the site's western, northern, eastern and southern sides. Aircraft noise is assessed during daytime hours using LAeq, 16-hour parameters. We have determined the impact of daytime noise by considering two landings and two departures during the daytime period. Our measurements show that there will be no change in noise level at the residential receptors at Eircode P51TPK, Eircode P51VY47, or Eircode P51VP80, whilst there will be an insignificant increase of 0.7dB (LAeq, 16-hour) at Location Eircode P51VP80. This noise impact is negligible regarding the continued use of the HEMS helicopter, an Eurocopter EC135T. It has been carefully designed to minimise noise, enabling use in night-flying applications over cities.

An assessment of forecast annual aircraft movements five or more years after commencement indicates that the likely increase in noise associated with expanded aerodrome activity would be approximately 2.5 dB. This increase represents a moderate change in noise level and, although permanent, is not considered significant in terms of noise impact. Changes of this magnitude occurring gradually over five years are unlikely to be perceptible. Furthermore, the proposed runway modifications, particularly the change in runway orientation, are expected to reduce noise levels at the most exposed residential property, partially offsetting the small, predicted increase. Overall, noise impacts arising from increased aircraft movements at the nearest residential receptors are considered to be insignificant.

The proposed runway extension at Rathcool is designed solely to improve safety and operational efficiency, not to increase aircraft noise or change aircraft types. A longer, tarmac runway allows aircraft to use lower engine power during take-off, reducing noise while providing greater safety margins. The extension will not alter the scale or nature of aviation activity at the Aerodrome.

10.7.3 "Do Nothing" Impact

If the Proposed Development were not to proceed, the noise environment at the nearest residential receptors would likely remain unchanged, except for minimal increases due to road and aircraft traffic as the population increases. However, the site will likely remain unchanged for this study's purposes, as regular aerodrome traffic is expected to grow naturally. Based on the baseline noise studies, the Do-Nothing scenario is likely to have no appreciable change and would be considered neutral in terms of noise change.

10.8 Avoidance, Remedial & Mitigation Measures

10.8.1 Construction Phase

Many general measures can reduce noise levels at the source, such as:

- (a) Avoid unnecessary revving of engines and switch off equipment when not required.
- (b) Keep internal haul routes well-maintained and avoid steep gradients.
- (c) Use rubber linings, such as chutes and dumpers, to reduce impact noise.

- (d) minimise the drop height of materials.
- (e) start-up plants and vehicles sequentially rather than all together.

The movement of the plant onto and around the site should be in accordance with the site's normal operating hours and the location of any NSPs as far as is reasonably practicable.

Conventional audible reversing alarms have caused problems on some sites, and alternatives are available. Audible reversing warning systems on mobile plant and vehicles should be of a type that, while ensuring proper warning, has minimal noise impact on persons outside the site. When reversing, mobile plant and vehicles should travel in a direction away from NSPs whenever possible.

10.8.1.1 Specification and Substitution

Where a construction site is within a noise-sensitive area, the plant and activities to be employed on that site should be reviewed to ensure that they are the quietest available for the required purpose; this is following the best practicable means for an existing operational site, where reasonably practicable, noisy plant or activities should be replaced by less noisy alternatives if noise problems are occurring.

10.8.1.2 Use and Siting of Equipment.

The construction plant should always be used according to the manufacturer's instructions. Site equipment should be kept out of noise-sensitive areas, and loading and unloading should also be carried out outside such areas.

Any construction plant from which the noise generated is known to be notably directional should, wherever practicable, be orientated so that the noise is directed away from noise-sensitive areas. Acoustic covers for engines should be kept closed when engines are in use or idling. If compressors are used, they should have effective acoustic enclosures and be designed to operate when their access panels are closed.

Materials should be lowered whenever practicable and should not be dropped. A resilient material should cover the surfaces on which the materials are being moved. When a site is in a residential area, lorries should not arrive or depart at times inconvenient to residents.

10.8.1.3 Maintenance

Regular and effective maintenance by trained personnel is essential and will do much to reduce noise from plant and machinery. Increases in plant noise are often indicative of future mechanical failure.

Sound-reducing equipment can lose its effectiveness before failure is indicated by visual inspection.

Noise from vibrating machinery with rotating parts can be reduced by proper balancing. Frictional noise from the cutting action of tools and saws can be reduced by keeping them sharp. Noises caused by friction in conveyor rollers, trolleys and other machines can be reduced by proper lubrication.

10.8.1.4 Controlling the Spread of Noise

General

If noisy processes can be avoided, the noise reaching the noise-sensitive area will be reduced. Alternative methods include increasing the distance between the noise source and the sensitive area or installing noise-reduction screens, barriers, or bunds.

Distance

Increasing the distance from NSPs is often the most effective noise control method. However, this might not be possible when work is conducted on a restricted site or in fixed structures, such as railway tracks. Stationary plant, such as compressors and generators, should be located away from noise-sensitive areas.

Screening

Screening may be considered at sites where it is impossible to mitigate a noise problem by increasing the distance between the source and receiver. For maximum benefit, screens should be close to the noise source (as with a stationary construction plant) or the listener. Careful positioning of noise barriers, such as bunds or screens, can significantly reduce noise levels. However, the visual impact of such obstacles should be considered.

10.8.1.5 Noise Control Targets

All reasonably practicable measures should be taken to protect local communities and individuals on construction sites from the detrimental effects of noise generated by construction operations.

Those seeking to determine suitable noise control targets for construction operations should be aware of the noise problems that can arise when such operations occur in existing buildings, whether occupied or adjacent to occupied buildings. Vibration introduced directly into the structure by equipment such as breakers, hammers, and drills may attenuate slowly as it is transmitted through the structure and produce unacceptable noise levels in rooms remote from the source. In particularly sensitive situations, alternative techniques and equipment might be necessary.

Monitoring noise at sites where noise is an issue should be considered essential. Measurement may be carried out for several reasons, including the following:

- (1) to allow the performance of noise control measures to be assessed.
- (2) to ascertain noise from items of plant for planning purposes;
- (3) to confirm that planning requirements have been complied with.

Monitoring positions should reflect the purpose for which monitoring is carried out.

Monitoring to determine whether an item of plant or a particular process meets an anticipated noise criterion, or whether noise control methods are effective, may require measurements to be taken close to the plant or process to minimise interference from other noise sources.

Monitoring to confirm that planning conditions imposed to protect local occupants have been met may be undertaken at NSPs or at the site boundary, with any necessary corrections applied. The choice of noise measurement locations to be included in the planning conditions

should reflect the requirement to accurately assess noise. Monitoring is the responsibility of the site operator and should be carried out by suitably trained personnel.

10.8.2 Operational Phase

When we assess noise changes relative to the existing noise climate, we observe insignificant operational changes. It is proposed that the Aerodrome should develop a 'fly neighbourly' programme whereby users of the Aerodrome could be made aware of noise-sensitive areas surrounding the airport and endeavour to reduce the impact of aircraft noise. Given the volume of aircraft movements at Rathcoole Aerodrome, operational noise is not of notable significance compared to busier regional airports. The 'fly neighbourly' programme must consider operational and safety constraints, which are paramount in agreeing to approaches and departures from the Aerodrome.

In conducting a robust and comprehensive assessment, we have also considered impulsivity and tonality associated with the proposed operational changes. It is essential to highlight that while our investigative site work considered both impulsivity and tonality, aircraft noise is generally not impulsive. Nonetheless, all our measurements accounted for both factors in the overall noise assessment. This analysis determined that the new aircraft under consideration did NOT exhibit impulsive or tonal characteristics. When measured, we can conclude that noise from the HEMS Eurocopter EC135T is neither impulsive nor tonal, as assessed objectively (using the method defined in ISO 1996-2:2017). It is unnecessary to correct the measured levels if they have been objectively demonstrated to be non-impulsive and non-tonal.

The projected annual flight movements are expected to rise from 2,533 to 4,499 over five years, an increase of 1,966 movements. This is estimated to result in an average increase of about + 2.5 dB in noise at residential locations over 5 years. The change is considered moderate and not significant, with a permanent but barely noticeable effect on noise levels.

The proposed 140 m runway extension and resurfacing at Rathcool are aimed solely at improving safety, providing longer take-off and landing distances. Upgrading from grass to tarmac reduces the engine power needed for take-off, lowering noise levels. The changes will not alter the type, classification, or volume of aircraft using the runway. Overall, the improvements enhance operational safety while potentially reducing noise without increasing aviation activity.

10.8.3 "Worst Case" Scenario

In addition to considering the typical daytime noise impact of the proposed Eurocopter EC135T, we have also considered the impact of the HEMS helicopter returning to base at night. While this is unlikely to occur frequently, it has been accounted for in the noise impact assessment. Our measurements indicate no change in noise level at the residential receptors at Eircode P51TPK. At Eircode P51VY47, there will be a marginal increase of 3 dB in the nighttime LAeq (8-hour) level, and a more minor increase of 2dB at Eircode P51FW9P. At

Eircode P51VP80, there will be no change in noise level. Again, it is essential to highlight that the Eurocopter EC135T is a modern aircraft, carefully designed to minimise noise, enabling night flying over cities.

Considering the proposed changes in Runway Heading, we have quantified the likely noise reduction benefit for an existing residential property circa 530m from the existing runway centreline 'Runway 08-26'. The new runway orientation, 'Runway 07-25', will increase the separation distance by 135m from the latest runway centreline. This change will reduce aircraft pass-by events by -2dB(A), resulting in a marginal reduction in aircraft noise at Eircode: P51WY83.

It is noted that there is no statutory guidance on aircraft noise exposure levels. We have a UK guidance document, ProPG, endorsed by the EPA, that addresses the impact of noise on residential areas, as there is no specific guidance. In addition, we have considered more UK research titled 'Survey of Noise Attitudes 2014: Aircraft Noise and Annoyance, Second Edition (CAP 1506)', which suggests that the study also showed some adverse annoyance effects can occur at 51dB LAeq, 16h. If we are to take this as being the most stringent and demanding assessment method, actual aircraft noise measurement of the existing Aerodrome with two departures and two arrivals per day for the HEMS Helicopter (Eurocopter EC135T) shows that noise levels at the nearest residential properties are some 12~20dB lower than a level that would give rise to some adverse annoyance effects. The existing noise contribution from the facility, with the continued use of the HEMS Helicopter (Eurocopter EC135T), will result in a noise climate at residential receptors that is very acceptable, thereby protecting the area's residential amenities. The precautionary principle has been applied throughout this assessment, and the worst-case scenario has been considered.

Accordingly, this Chapter assesses current aircraft movements and the projected increase over a five-year period, including both fixed-wing and HEMS helicopters. To ensure the assessment captures the worst-case scenario, it also accounts for the noise impact of the HEMS helicopter returning to base at night, when prevailing background noise levels are typically lower.

It is essential to clarify that the proposed works comprise a minor change to the runway's orientation and a minor increase in runway length. The proposal does not relate to any intensification of activities at Rathcool Flying Club.

This Chapter addresses current levels of aircraft movements at the site, based on data collected over three years, and assesses the likely effects of natural growth anticipated five years after the development's completion. The potential noise impacts on residential receptors in the surrounding area have been evaluated for this five-year post-completion scenario, together with the likely changes in noise levels arising from the proposal.

Having reviewed the Proposed Development to be retained, we are satisfied that the proposed changes align with prevailing guidance and standards. The proposal has little difficulty demonstrating, through scientific measurement and prediction, that the effects of aircraft noise and continued use of the HEMS Helicopter, Eurocopter EC135 T, are unlikely to create any adverse impact, with no appreciable change in the operational noise climate.

Projected aircraft movement data has also been considered in relation to the likely increase in traffic at the Rathcoole Flying Club, and estimates indicate only a marginal increase in noise level (approximately +2.5dB) following the upgrade, approximately 5 years after commencement.

The proposed 140 m runway extension and resurfacing at Rathcool are intended solely to improve safety by providing longer take-off and landing distances. Upgrading from grass to tarmac reduces the engine power needed for take-off, lowering noise levels. The changes will not alter the type, classification, or volume of aircraft using the runway. Overall, the improvements enhance operational safety while potentially reducing noise without increasing aviation activity.

Growth of Aircraft Movements

Rathcool Aerodrome has historically provided flight training, consistent with the operation of similar aerodromes nationwide. These activities, including circuit operations, do not constitute a new noise source or an increase in use. Instead, they reflect the continuation of established operations and will be addressed comprehensively within the planning submission.

Flying circuits is a key part of flight training, and the runway is currently used for this operation and will continue to be used following completion of the development. International standards require that aircraft joining to land at an airfield join an international standard circuit pattern. An aircraft can follow the full joining procedure, which involves joining overhead the airfield and entering the circuit pattern in preparation for landing. Pilots use the circuit pattern to improve proficiency and landing positioning in a disciplined format. From a noise perspective, noise is intentionally minimised, and the pattern is flown at 1,000 feet above ground level or higher if weather conditions permit. Deliberate efforts to avoid built-up areas are always employed. Circuit training is used to accurately position the aircraft for landing with the ultimate objective of improving pilot proficiency in landing and take-off. Circuit training involves an aircraft taking off from the runway, climbing to 500ft above ground level (approximately 3 miles from the Aerodrome), then making a number of right-angle turns until it is parallel to the runway. Another right-angle turn is made before the aircraft lands once again at Rathcool. A diagram of the circuit route is shown below.

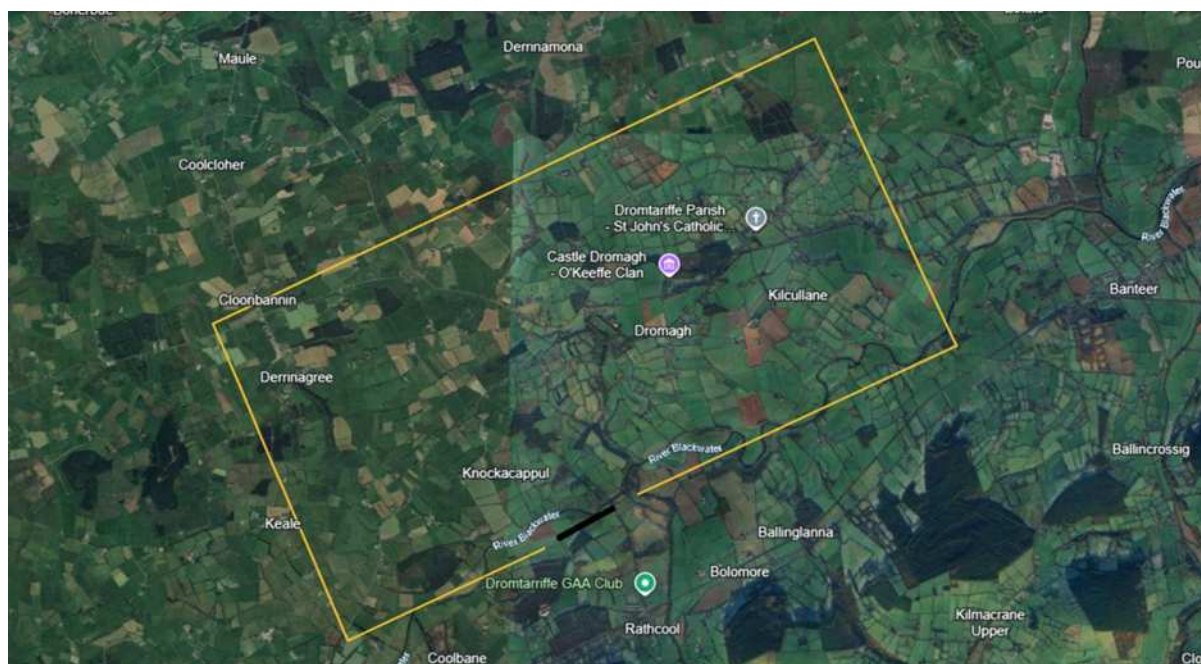


Figure 10-9: Diagram of the circuit route.

The noise impact assessment considers both existing traffic levels at Rathcool Airport and projected future increases in activity. The modelling indicates that, based on forecast traffic growth over the next five years, noise levels are expected to increase by approximately 2.5 dB. This increase is marginal and is generally regarded as insignificant in practical terms.

Furthermore, when the development is assessed against relevant guidance, it can be seen that the LAeq,16hr values for both the existing situation and the future scenario (+5 years) remain comfortably below the LAeq,16hr threshold of 57 dB, which represents the onset of low annoyance as defined in *Survey of Noise Attitudes 2014: Aircraft Noise and Annoyance, Second Edition (CAP 1506)* by the Civil Aviation Authority (adopted from the UK 1990 thresholds for policy consideration).

It is also noted that advances in light-aircraft technology typically reduce noise emissions. As with road vehicles, modern aircraft are generally quieter than older models, and emerging electric light-aircraft options may offer further noise-reduction benefits. Electric light-aircraft options have not been considered as part of this Noise Impact Assessment, as they represent a new, up-and-coming phenomenon. Furthermore, the club aims to convert its Cessna aircraft to Sustainable Aviation Fuel by 2030, which is expected to reduce noise by 40%.

10.9 Residual Impacts

10.9.1 Construction Phase of the Project

Effects on population and health during the construction phase are expected under various environmental conditions and will be mitigated as described in other relevant chapters of this EIA. During the construction phase of the Proposed Development, noise impacts will be experienced by receptors nearest to the subject site. It is expected that the proposed mitigation measures will minimise noise and vibration impacts. The predicted noise and vibration effects

on the receiving environment during the construction phase are considered moderate and temporary, affecting only a small number of properties for a short period.

10.9.2 Construction Traffic on Local Roads

The proposed scheme is estimated to increase daily road traffic by 30 rigid HGVs over 32 working days. Restrictions on working hours for any operation that could harm occupants of noise-sensitive properties should be considered. In general, road haulage from the sites should be limited to 07:00 hours and 19:00 hours, unless local circumstances require otherwise. However, working hours for construction and HGV activity on-site and on public roads will likely be defined through conditions attached to the planning consent for the proposed development.

10.9.3 Operational Phase of the Project

The potential for noise generation during the operational phase of the Proposed Development is limited to a small number of additional HEMS staff vehicles or to Rathcool Aerodrome users on the surrounding road network. The predicted change in vehicle numbers is not significant overall. The existing and predicted aircraft noise on the receiving environment during the operational phase is considered not substantial in the long term. When considering the projected aircraft movement data, it is also concerning that traffic at the Rathcoole Flying Club is likely to increase. Estimates indicate marginal increases in noise level (approximately +2.5dB) following the upgrade, approximately 5 years after commencement.

10.10 Monitoring

10.10.1 Construction Phase

The contractor will be required to ensure that construction activities operate within the noise and vibration limits set out in this assessment and undertake regular noise and vibration monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded.

Noise monitoring should follow the International Standard ISO 1996:2017, Acoustics – Description, measurement, and environmental noise assessment.

Following BS 6472 for human disturbance, vibration monitoring, and BS ISO 4866:2010 for building damage should be conducted.

10.10.2 Operational Phase

Post-construction, it is common practice (**six months after operation**) to undertake a noise verification study to confirm that actual operational noise levels align with those predicted during the assessment. Such a study would verify the noise impacts arising from the development once operational. The requirement for post-completion noise monitoring would be at the discretion of the planning authority and would serve to confirm compliance with the predicted and assessed noise levels.

10.11 Interactions

According to the EPA's Guidance (Guidelines on the information to be contained in Environmental Impact Assessment Reports, May 2022), our study shows that environmental noise primarily affects humans, flora, and fauna. Our study examines the impact on people living in the Proposed Development area, as addressed in the chapters above.

When considering the Proposed Development, the noise change is insignificant compared to the site's existing noise levels. Accordingly, the likely effects on flora and fauna are not expected to significantly affect local birdlife and wildlife. Chapter 5 of the EIAR specifically addresses biodiversity. Generally, the primary receptors sensitive to noise at the site would be birds and bats, or the breeding sites of mammals such as badgers or otters. It is understood that there is no potential for significant disturbance impacts on fauna in the Biodiversity Chapter or NIS.

10.12 Difficulties Encountered When Compiling

During the assessment, no significant difficulties were encountered while compiling this report. A detailed construction management plan had not been completed; therefore, it was necessary to estimate the likely construction activities. For helicopter medical evacuations, it is challenging to quantify the exact number of future emergencies; however, estimates have been prepared based on the facility's projected requirements. The potential impact of existing and future operational noise has been adequately accounted for by typical helicopter medical evacuation demands, which are unlikely to change significantly given the area served by medical evacuation helicopter services.

10.13 References

British Standard Institute (BSI) British Standard (BS) 5228-1:2009 +A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (hereafter referred to as BS 5228-1) (BSI 2014a)

BS 5228-2:2009+A:2014 Code of Practice for Noise and Vibration Control of Construction and Open Sites - Part 2: Vibration (hereafter referred to as BS 5228-2) (BSI 2014b)

BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground-borne vibration (hereafter referred to as BS 7385-2) (BSI 1993)

BS 6472-1: 2008 Guide to evaluation of human exposure to vibration in buildings, Part 1 Vibration sources other than blasting (hereafter referred to as BS 6472-1) (BSI 2008)

S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018 (hereafter referred to as the Noise Regulations)

S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006

Professional Guidance on Planning & Noise (ProPG), (IoA, 2017)

UK Civil Aviation Authority: Survey of noise attitudes 2014: Aircraft CAP 1506

ISO 1996-1:2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (hereafter referred to as ISO 1996 – 1) (ISO 2016)

ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (hereafter referred to as ISO 1996 – 2) (ISO 2017)

World Health Organisation (WHO) Environmental Noise Guidelines for the European Region (hereafter referred to as WHO Environmental Noise Guidelines)(WHO 2018)

Guidelines on the information to be contained in Environmental Impact Assessment Reports (May 2022).

Cork Agglomeration -Noise Action Plan 2024~2028 – 12th September 2024

11 LANDSCAPE AND VISUAL ASSESSMENT

11.1 Introduction

This chapter of the EIAR provides an assessment of the landscape and visual impact associated with the Proposed Development. Cathal O'Meara Landscape Architects have prepared this assessment on behalf of Rathcool Flying Club, Rathcool Aerodrome, Knockcahill, Rathcool, Mallow, Co. Cork. The Proposed Development consists of 'The construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing operations building and paramedic base building to the east of the site, and construction of a new operations and paramedic base building to the west of the site; and the demolition of an existing helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary waste water treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, the upgrade of an existing entrance onto the L-5215-0 road, site landscaping and all other associated site development works.

This assessment describes the existing receiving environment, landscape context and the methodology used to assess the impacts. It assesses the visual extent of the proposed development and its visual effects on key views throughout the study area. It describes the landscape character of the application site, together with the visibility of the site from significant viewpoints in the locality. The report summarises the impact of the proposed development on the visual and landscape amenity of the application site and contiguous area.

The site is located approximately 1km from the village of Rathcool in northwest Cork in a predominantly rural landscape. As such this assessment looks at the planning context for the site as well as the landscape context for the wider area.

This report has been prepared in tandem with a Landscape drawing of the proposed development and is included as Appendix 11.1 to this report. (in A3 format). A series of photographs of the site from the selected viewpoints is also included as appendix 2. These locations are the subject of the assessment in Section 11.5 of this report.

11.1.1 Quality Assurance and Competency of Experts

Cathal O'Meara Landscape Architects were commissioned to conduct the Landscape and Visual Impact Assessment Chapter of the EIAR. Cathal O'Meara undertook this Assessment. Cathal has studied, taught and practiced Landscape Architecture at a Masters level for 17 years. Cathal is a Chartered Landscape Architect and Member of the Irish Landscape Institute. Prior to establishing Cathal O'Meara Landscape Architects in 2010, Cathal worked as a landscape architect in Saudi Arabia, Dubai, Guatemala, Norway and the UK. Cathal also holds a graduate Degree in Industrial Design where he was awarded a first-Class honours degree from the National College of Art and Design in 2002.

Cathal O'Meara Landscape Architects were multiple national award winners at the Irish Landscape Institute Awards in both 2020 and 2022.

11.2 Study Methodology

This methodology includes a desktop analysis of the existing landscape area, including specific designations and land use patterns. Several site visits were undertaken to assess the likely visibility and consequent visual impact of the proposed development. Cathal O'Meara Landscape Architects undertook these in late Spring and late Summer 2024 from the site and from the roads in the vicinity. The conditions were clear with good visibility.

The following maps were included as part of the desktop review and were also used as field references

- Ordnance Survey Map 1:50,000 – 4/5th edition Map No's 72 and 79.

This Assessment follows best practice advisory guidelines set out in the following guidance documents

- Guidelines for landscape & Visual Impact Assessment" 3rd Edition, published by the Landscape Institute (UK), - (2013).
- Draft Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA 2022)
- Draft Advice Notes for preparing Environmental Impact Statements (EPA, 2015)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (August 2018)

This assessment has regard to related documents, specifically

- Cork County Development Plan 2022-2028
- Cork County Draft Landscape Strategy (2007)
- Kanturk Mallow Municipal District Local Area Plan 2017

11.3 The Existing and Receiving Environment (Baseline Situation)

A detailed description of the landscape and surrounding context to the proposed development is included below. This description is sub divided under separate headings to allow a structured overview of the existing landscape context as it relates to the sensitivity of the site and the proposed development.

Extent of study area

A five km study area has been established to determine the likely impact of the development on views.

Given the location of existing visual barriers within this valley landscape including the lower hills of the Boggeragh Mountains as well as large stands of coniferous forestry and the low

lying nature of the site itself, the principal visual receptors are located on public roads, residences and fields in close proximity to the site itself.

The viewpoints identified for further analysis are not intended to include each and every location, but are selected to represent a range of receptor types, distances and angles. The actual visibility of the site from the wider landscape is greatly impacted by existing vegetation and topography and as such the study area as identified below must be considered a greater extent that is actually visible.

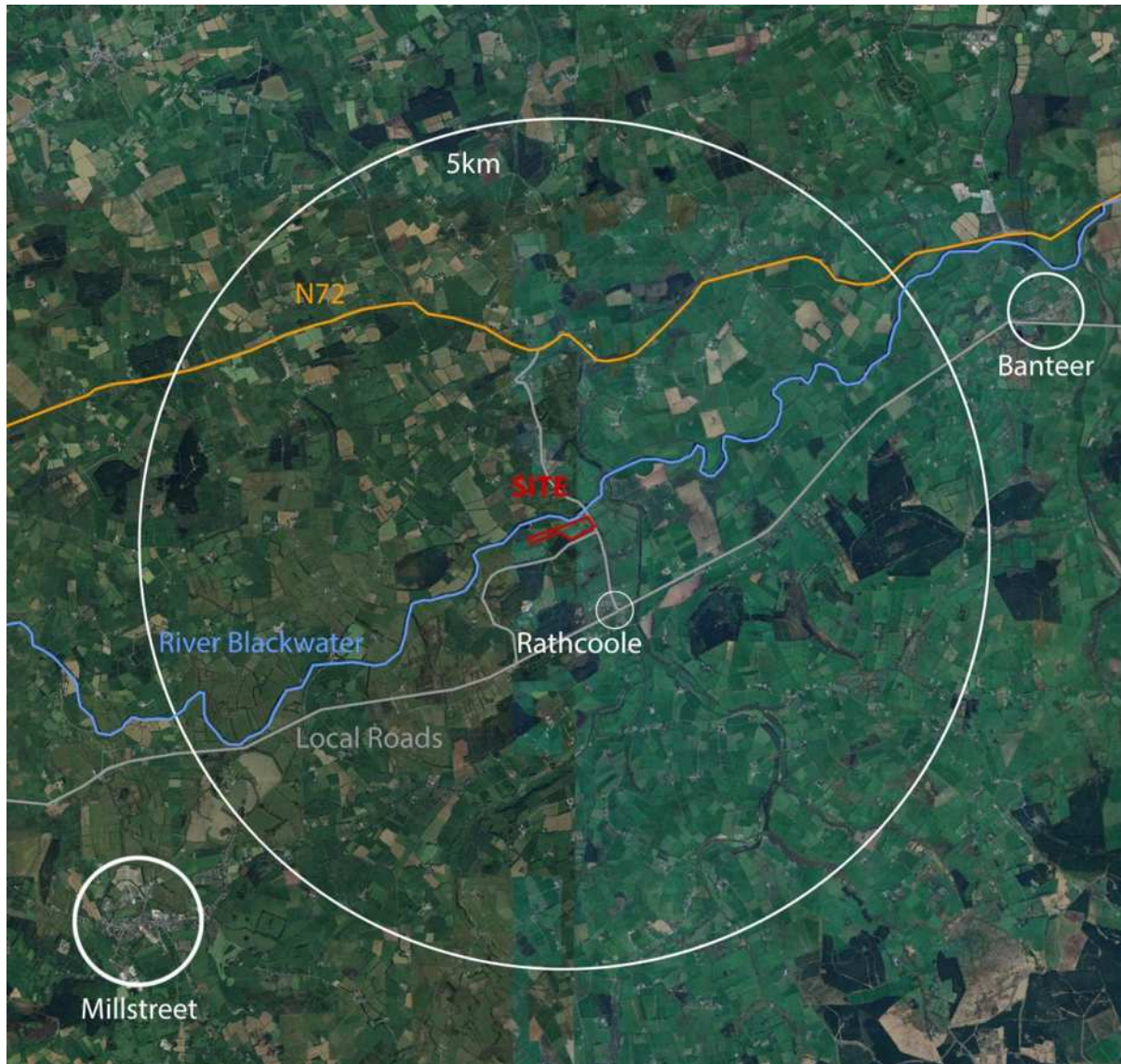


Figure 11.1: Five kilometre extent of the study area and principle landscape elements.

Cork County Development Plan 2022-2028

The CCDP includes five objectives relating specifically to landscape. These are;

- a. Protect the visual and scenic amenities of County Cork's built and natural environment.

- b. Landscape issues will be an important factor in all land-use proposals, ensuring that a pro-active view of development is undertaken while protecting the environment and heritage generally in line with the principle of sustainability.
- c. Ensure that new development meets high standards of siting and design.
- d. Protect skylines and ridgelines from development.
- e. Discourage proposals necessitating the removal of extensive amounts of trees, hedgerows and historic walls or other distinctive boundary treatments

Cork County Council Draft Landscape Strategy, 2007

This strategy has been incorporated into the CCDP 2022-2028. This identifies

- Landscape Character Types,
- Landscape Character Areas and
- Landscape Sensitivity



Figure 11.2: Excerpt from Cork County Development Plan (2022-2028), Chapter 14, Figure 14.2 showing location of site in relation to High Value Landscapes.

The subject site is not located in a “High Value landscape”.

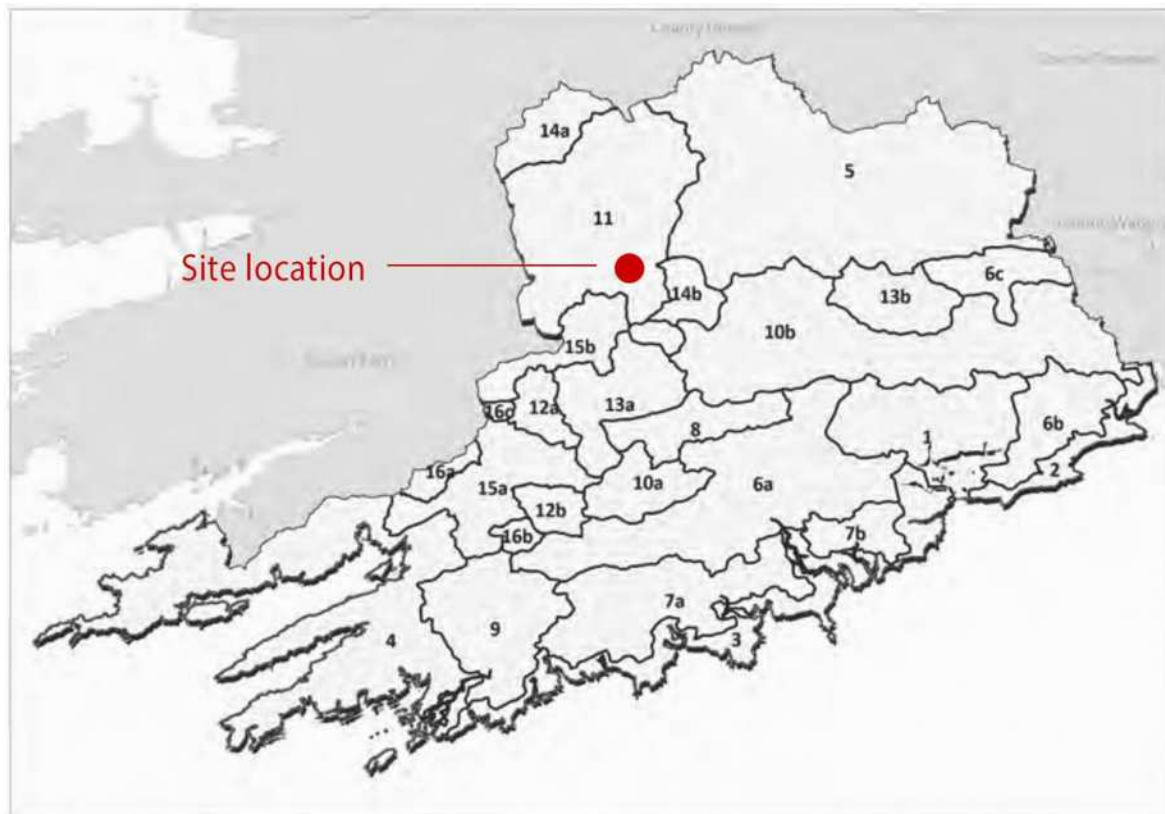


Figure 11.3: Excerpt from County Cork Development Plan (2022 – 2028) indicating approximate location of site in relation to Landscape Character Areas .

The subject site is located in Landscape Character Area “11 Broad Marginal Middle ground Valley” A number of recommendations are outlined in the Draft Cork County Landscape Strategy regarding LCT11 – ‘Broad Marginal Middle ground Valley. Those relevant to the proposed development are included below:

- Minimise disturbance of hedgerows in rural areas and encourage appropriate landscaping and screen planting of proposed developments by using predominately indigenous/local species and groupings. Broadleaf planting should be encouraged in this landscape type, as it is the prevailing foliage.
- Promote introduction of deciduous edges to existing coniferous plantations to soften their appearance. New plantations should respect landscape pattern (see Forestry Guidelines).

11.3.2 Landform and Drainage

The site lies within the upper section of the Blackwater Valley. This is a largely flat alluvial landscape with lands rising to the north and south and forming low hills with local peaks of 130 – 240 meters. These hills direct rainfall towards the central valley and are roughly equidistant from the River Blackwater. The Blackwater at this location follows a roughly north eastern direction and the accompanying low hills parallel this trajectory.



Figure 11.4: Location of the site to the left of the River Blackwater ,with the Boggeragh mountains in the distance.

11.3.3 Vegetation and Landuse

The site is currently managed as a mown meadow. As this practice has been maintained for several decades, the fertility of the meadow has been reduced sufficiently to allow an interesting sward of diverse native forbs and grasses develop. The immediate runway is maintained at a lower level and has not allowed the same diversity of species to emerge.



Figure 11.5: Existing grassed runway and managed meadow.

To the north of the site the River Blackwater has been managed by regularly pruning the emerging stands of trees so as not to present difficulties for landing planes.



Figure 11.6: Indicating trees overlooking the Blackwater that are regularly managed by reducing their height (pollarding).

To the south of the site and adjacent with the local road is a native hedgerow. Currently this is being pruned with vegetation mostly maintained below two meters in height. Some larger trees are evident here, though many of the Ash trees are currently suffering from Ash Dieback Disease. A similar condition exists to the east of the site with the notable exception of larger trees present in the roadside verge. The Landscape Drawing Appendix 11.1 identifies the existing roadside vegetation that is to be pollarded to reduce its height to approximately 2 meters tall.

11.3.4 Centres of Population and Houses

Rathcool village is 1km to the south of the site, with the larger villages of Millstreet and Banteer approximately seven kilometres to the southwest and northeast respectively. In the Cork County Development Plan (2022 – 2028) Rathcool is described as a village with a total of 79 houses. The village is considered part of the Kanturk Mallow Municipal District. Adjacent land uses to the aerodrome are agriculture and forestry.

11.3.5 Transport Routes, Scenic Routes and Views

The principal transport route with respect to the proposed development is the N72 which travels between Killarney and Mallow. This road is approximately 2km to the north of the site. Two other local roads travel on the site perimeter. To the east this is a local road which joins the N72. To the south another local road travels the site boundary in a southwestern direction.

Chapter 5 of the CCDP (2022-2028) details Heritage and Amenity assets of the County. Within this context a number of Scenic routes are identified throughout the county. However only S18 as indicated, is within the study area. This lies 4.5 kilometres to the southeast. No views will be possible of the proposed development from this location.

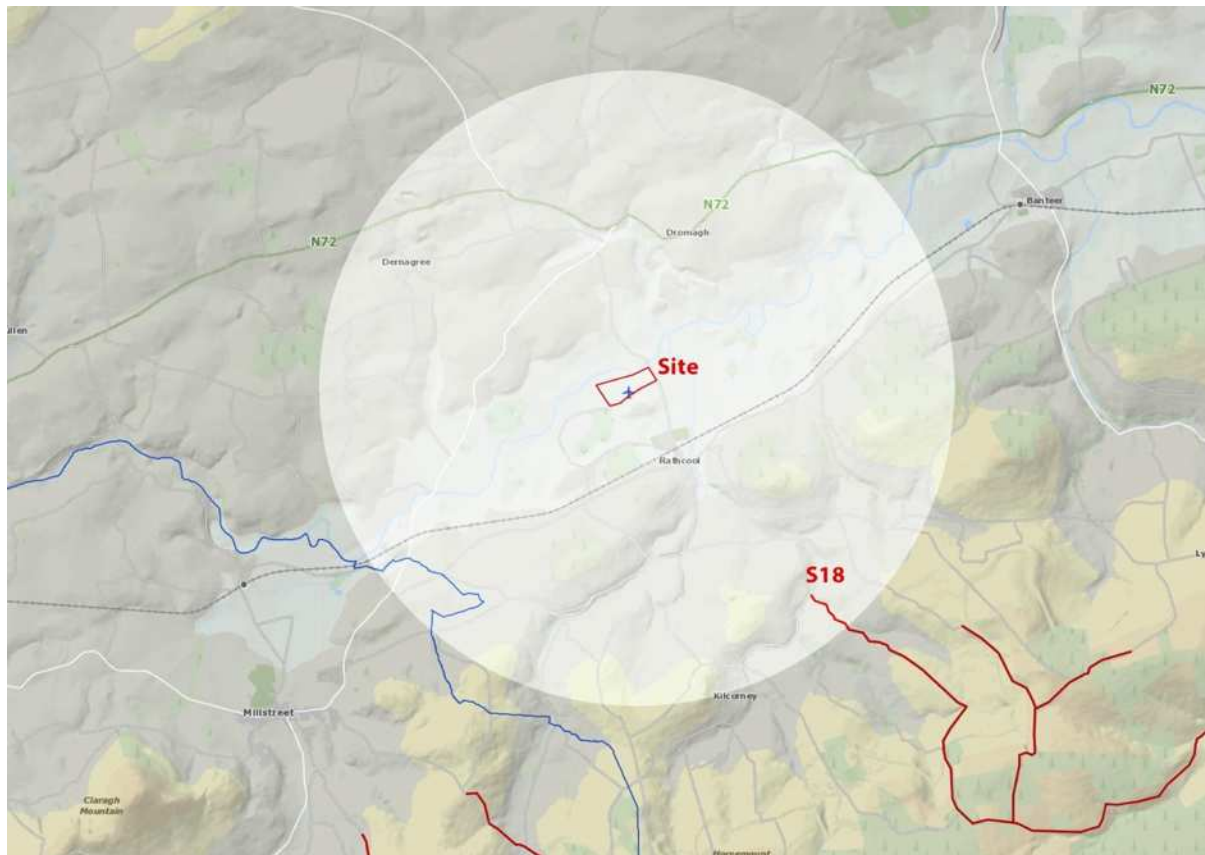


Figure 11.7: Site and 5km Study Area.

Table 11.1: Scenic Route S54 and key attributes.

Scenic route	Description and general views being protected	Structures of Historic or Cultural Importance Visible from Route	Key characteristics of land use	Visibility of proposed development
S18	Local Mountain Roads between Seefin, Kilcorney and Nad. Views of the Boggeragh Mountains and distant views of the Caherbranagh and Derrynasaggart Mountains	N/A	Subsistence farming and upland commercial forestry	No

11.3.6 Heritage and Amenity Features

The River Blackwater is known for its water based recreation. Currently sections of the Blackwater have received Blueway funding to develop a series of infrastructural projects aimed at facilitating greater access and use for water based recreation. This section of the upper blackwater is currently not part of current initiatives.

The Blackwater Way (the combined Duhallow and Avondhu Ways) is a 168 km walking route that stretches from County Kerry across north County Cork and into County Waterford before joining with long distance E8 European Walking Route. The nearest section of the Blackwater Way lies approximately 8 km to the south.

Drishane Castle is the nearest Architectural Conservation Area. This is approximately 5.5 km to the southwest.

The River Blackwater is a Special Area of Conservation. These are prime wildlife conservation areas in the country, considered to be important on a European as well as Irish level, The legal basis on which SACs are selected and designated is the [EU Habitats Directive](#), transposed into Irish law .

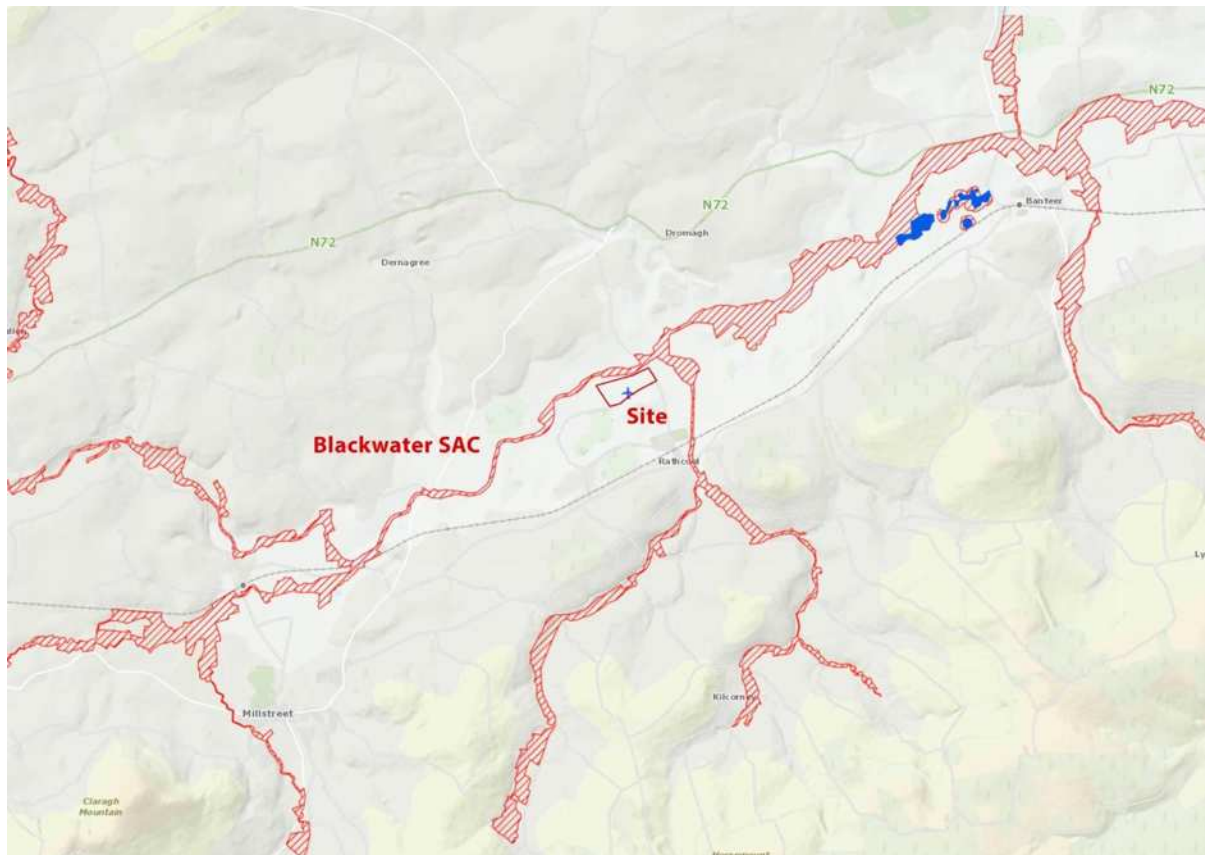


Figure 11.8: Site and Blackwater SAC.

11.3.7 Key Visual Receptors Assessed

A series of visual receptors is included below to represent views of the proposed development from the wider site area. These receptors include views from nearby roads, residences and community settings.

Table 11.2: Description of Visual Receptors.

Viewpoint	Location	Receptor type	Distance to site
Location 1	On local road between Banteer and Rathcool	Local residents home Road, at	3.6 km northeast of site
Location 2	On local road between Banteer and Rathcool	Local residents home Road, at	2.7 km east of site,
Location 3	On local road between Banteer and Rathcool	Local residents home Road, at	2.1 km east of site,
Location 4	On local road between Banteer and Rathcool	Local Road	1.4 km southeast of site
Location 5	On local elevated road	Local residents home Road, at	1.7 km southeast of site

Location 6	Within Rathcool village at St. Brendan's National School	Village Centre and school	1.3 km south of site
Location 7	On local elevated road	Local Road	1.9 km southwest of site
Location 8	On local road	Local Road, residents at home	650m southwest of site
Location 9	On local road	Local Road, residents at home	1.25km northwest of site,
Location 10	At Dromtariffe Graveyard	Graveyard and local residents at home	2.6 km northeast of site,
Location 11	At site boundary, on bridge over Blackwater	Bridge over Blackwater on local road, travelers on local road	5 meters from site
Location 12	On local road	Local Road, residents at home	140m south of site

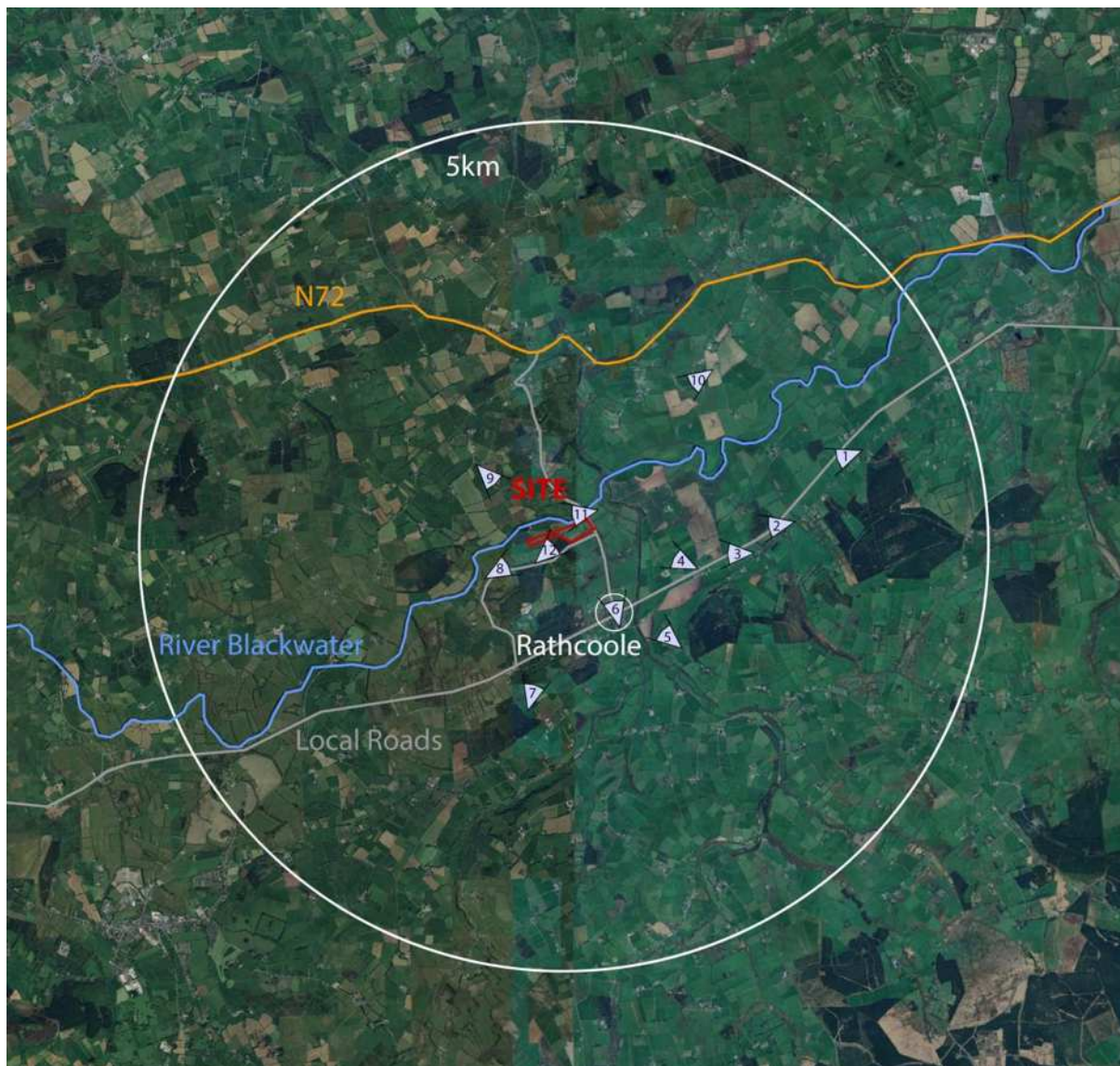


Figure 11.9: Location of the visual receptors with respect to the site.

11.4 Characteristics of the Proposed Development

The development seeks permission on behalf of The Rathcool Flying Club for the construction of a hard surfaced runway (740m in length), taxiway and helipad with associated ground level lighting, associated interceptors, along with the relocation of an existing hangar, paramedic prefabricated base, crew prefabricated bases and all associated works.

Rathcool Aerodrome facilitates the Air Ambulance Service which is funded by the HSE. Rathcool Aerodrome facilitates on average 2 air ambulance (helicopter) callouts per day.

The development will realign the existing runway (Runway 09-27) by 30 degrees to become 'Runway 06-24'. This change in direction will have three key benefits:

1. Increased landing and take-off distances.
2. Better orientation to avail of the prevailing south-westerly winds.

3. Further separation from residential receptors.

The realigning of the runway also provides for a better approach to the Rathcool Aerodrome, with improved distances from mountain ranges and wind farms on the south-eastern approach.

The hard surfacing of the runway will improve the safety of operations for both the Rathcool Flying Club and the HSE Air Ambulance. While it is intuitive that planes require a runway to take off and land, best practice for helicopters is also to use airstrip for the transition to forward flight and landing. Helicopters are designed to take off and land vertically if required, but this remains a dangerous phase in the flight process.



Figure 11.10: Updated Landscape Plan (compiled as part of RFI) showing existing and proposed runway.

11.5 Potential Impact of the Proposed Development

11.5.1 Impacts on Existing Vegetation

11.5.1.1 Construction Phase

The Proposed Development requires the removal of approximately fifty trees which currently form part of hedgerows at three locations. These trees/hedgerows are indicated in the Landscape drawing of the proposed development (Appendix 11.1 to this report) as Group E – (middle hedgerow), Group B (western hedgerow) and Group H. The hedgerows at locations

E and B total approximately 130 meters in length. The hedgerow at location H is approximately 35 meters in length.

The Middle Hedgerow contains

- 1 large whitethorn (*Crataegus monogyna*)
- 1 Large Oak (*Quercus* Sp.)
- 3 Ash trees (*Fraxinus excelsior*)
- Willow (*Salix Caprea*)

The western Hedgerow contains approximately 30 trees principally consisting of Whitethorn (*Crataegus monogyna*) and Blackthorn (*Prunus spinosa*).

The southern hedgerow will also require removal for a section 35 linear meters in length to facilitate the entrance to the new service building.

This hedgerow currently contains

- 30 mixed whitethorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*)
- 1 Holly, (*Ilex aquifolium*)
- 2 Ash trees (*Fraxinus excelsior*)

Separately the existing Hedgerows will need to be pollarded (reduced to to a maximum height of 2 meters tall) at the locations A, C, D, F and G in the Landscape Drawings 2411 LAP001. This will have the most significant impact at the east of the site adjacent to the bridge over the Blackwater River on the local road. The trees on both sides of this road (east and west) will need to be pollarded to 2 meters high to facilitate approach to the runway.

This hedgerow currently contains

- 7 large Sycamore (*Acer pseudoplatanus*)
- 1 Lime tree (*Tilia cordata*)
- 1 Common Alder (*Alnus glutinosa*)
- 1 Ash (*Fraxinus excelsior*)

It is worth noting that although these hedgerows are currently relatively tall, this is only a recent phenomenon. The historic pattern of maintenance has been to regularly prune these hedgerows to 2 meters in height.

As part of the construction works, the existing short cropped grassed runway will be allowed to revert to a longer managed meadow. The proposed runway, taxiway and helipad will in addition require the removal of approximately 13320m² of the existing meadow and replacement of this surface with a hard surface. The depth of this will be determined from site investigations.

Finally a haul route will be required to facilitate the removal of existing soils. This will also necessitate the removal of the meadow during the limited constructions period , anticipated to be approximately six months in duration.

It is proposed that during the construction phase of the project the works will include the decommissioning of the existing grass runway and the PSI clearance, foundation construction works and construction of the new runway and taxiway as well as the necessary landscaping and restoration of the site. It is expected that while the construction phase will generate both landscape and visual impacts, their impact will be low due to the fact that there are large separation distances between the site and residential receptors in addition it is worth noting that the construction work will be temporary in nature and as such will be a relatively short-term impact.

During the construction phase much of the excavated soil will be removed from site. In the event of any damage to the meadow it is proposed not to use any imported seed for this reinstatement, but to collect the seed from the existing meadow as the source. This process of Hay Strewing uses green hay from the cut meadow and distributes this hay on the bare soil for several days.

11.5.1.2 Operational Phase

The existing grassed runway will be maintained at a longer height than at present, facilitating increased biodiversity potential.

The haul route will be reinstated with a grassland meadow using the process of Hay Strewing as described above and will be maintained as such during the operational phase.

11.5.2 Impact on Landscape Character

11.5.2.1 Construction Phase

The construction phase will create increased activity on site. This activity as identified in the Construction and Environmental Management Plan (CEMP) will be principally undertaken by 2No. 22 tonne excavators. However it is likely these excavators will be accompanied by lifting equipment, dumper trucks, compressors, and generators.

The proposed general construction hours are 07:00 to 18:00 Monday through Friday and 08:00 to 14:00 Saturdays. These works will intensify familiar patterns of traffic already present on local roads.

The removal of existing trees and hedgerows will have a negative, moderate and permanent impact on existing landscape character. Site hoarding, construction traffic, ground disturbance and temporary structures required for construction will have a negative moderate and short-term impact on the existing landscape character.

The construction phase will involve removal of short sections of hedgerow as indicated in the Landscape Drawing. The sections of hedgerow to be removed will be accumulatively 167 meters long and will facilitate the increased runway length. In addition 501 meters of hedgerow will also need to be pollarded. This will involve reducing the height of the existing trees within these hedgerows. It is proposed to plant these existing hedgerows with additional Hawthorn, Blackthorn, Crab Apple, Willow and Holly species as a compensatory measure at a rate of 1 plant per linear meter.

In addition an area of 1000 meters of woodland will also be planted with native trees at a rate of 1 plant per m².

A secondary native hedgerow (located inside the existing southern hedge) composed of native species, will be planted and allowed to grow up to 2M high. This hedgerow will be a total of 290 linear meters in length.

Any development will give rise to some degree of landscape and visual impact. The greatest impacts tend to occur during the (short-term) construction phase when site disturbance associated with stripping of soils and movement of machinery maybe unfamiliar and draws particular visual attention to the Site.

From a landscape character perspective the sensitivity of the receiving landscape environment is assessed as being Medium and the Magnitude of Change is considered Low. The landscape impact of the construction phase is assessed as being of Slight to Moderate Negative Short-term Significance and will not be substantially different from agricultural related impacts, where heavy combine harvesters are used within nearby farms and fields.

11.5.2.2 Operational Phase

During the operation phase the negative short term impact identified during the construction phase will revert to a more settled landscape pattern. The ongoing maintenance practices will present a neutral, moderate and permanent impact.

11.5.3 Impact on Views

11.5.3.1 Construction Phase

Site hoarding, construction traffic, ground disturbance including soil storage and temporary structures required for construction will have a negative, moderate and short-term impact.

11.5.3.2 Operational Phase

Twelve key views were chosen to illustrate the visual impact of the Proposed Development. The views are numbered 1 to 12 and include long, mid and short-distance views.

View 1

Looking west towards the site. The site is approximately 3.6km distant. The view is looking from an elevated local road as it crosses over a railway bridge. The railway and associated barriers are evident in the foreground. There are significant field boundaries and mature screening vegetation which prevent any views of the proposed development. The view is assessed as being of Medium level of sensitivity. Therefore, there will be no change in the view and the Proposed Development will have no visual effect.

View 2

Looking west towards the site. The site is approximately 2.7km distant. The view is looking from the Banteer - Rathcool local road across farmed fields and terminates in a coniferous

plantation which prevent any views of the proposed development. The view is accessed as being of medium level of sensitivity. Therefore, there will be no change in the view and the Proposed Development will have no visual effect.

View 3

Looking west towards the site. The site is approximately 2.1km distant. The view is looking from the Banteer - Rathcool local road through a field gateway across farmed fields. There is significant field screening vegetation, principally found in the field boundaries which prevent any views of the proposed development. The view is accessed as being of Medium level of sensitivity. Therefore, there will be no change in the view and the Proposed Development will have no visual effect.

View 4

Looking west towards the site. The site is approximately 1.4km distant. The view is looking from an elevated local road as it rises above the Mallow-Tralee railway line. This is a farmed setting, with large fields, and a working farmyard with associated sheds and a principal residence evident in the midground. There is significant screening vegetation in the field boundaries and tree lines associated with the Rathcool River. This prevents any views of the proposed development. The view is accessed as being of Medium level of sensitivity. Therefore, there will be no change in the view and the Proposed Development will have no visual effect.

View 5

Looking northwest towards the site. The site is approximately 1.7km distant. The view is looking from an elevated local road as it rises up the foothills of the Boggeragh Mountains. This elevated panoramic view looks over a patchwork coverage of fields and woodlands. The buildings of Rathcool are perceptible in the midground. The site is not visible in the background. The view is accessed as being of Medium level of sensitivity. Therefore, there will be no change in the view and the Proposed Development will have no visual effect.

View 6

From Rathcool village, looking north towards the site. The site is approximately 1.3km distant. The view is looking from the centre of the village just outside St. Brendan's National School. Local vegetation in the gardens and hedgerows screen any views of the site. The view is accessed as being of High level of sensitivity. Therefore, there will be no change in the view and the Proposed Development will have no visual effect.

View 7

Looking north towards the site. The site is approximately 1.9km distant. The view is looking from an elevated local road as it rises up the foothills of the Boggeragh Mountains. This elevated panoramic view looks over a patchwork of fields and woodlands and is similar in context to view 5. A collection of local dwellings is evident some 500 meters to the north, adjacent to the railway line. However the railway line itself is not visible. It is similarly unlikely that any aspect of the proposed development will be evident from this distance. The view is accessed as being of Medium level of sensitivity. The site is barely perceptible in the background. This will present a Low-negligible level of change to the view resulting in a not significant and neutral visual impact.

View 8

From unnamed local road, looking northwest towards the site. The site is approximately 650m distant. This tree lined local road, presents occasional glimpses towards the site. Depending on the exact location it is possible that views of the planes landing and taking off will be evident. However it is unlikely given the low elevation that any views of the proposed runway will be possible. Similarly given the distance the minor loss of vegetation will be insignificant from this distance. The view is accessed as being of Medium level of sensitivity. This will present a Low-negligible level of change to the view resulting in a not significant and neutral visual impact.

View 9

From local residential/farm lane, looking southeast towards the site. The site is approximately 1.25km distant. The view is looking across farmed fields towards the site. A residential house and a farmyard are both evident within the frame, both are planted with evergreen screening trees and have somewhat limited views of the wider countryside. It is possible depending on the exact location of the viewer that a greater view of the development will be evident. The view is accessed as being of Medium level of sensitivity. However from this viewpoint there will be no change in the view and the development will have no visual effect.

View 10

From Dromtariffe Graveyard and associated church (in ruins).

Looking southwest towards the site. The site is approximately 2.6km distant. The view is looking from the old graveyard across farmed fields and mature hedgerows towards the site. This pleasant vista, while not remote contains elements of a gentle anthropomorphic landscape, with the Boggeragh Mountains evident in the background. A residential house and a farmyard are both evident within the frame, both are planted with evergreen screening trees and have somewhat limited views of the wider countryside. It is possible depending on the exact location of the viewer that a greater view of the development will be evident. The view is accessed as being of High level of sensitivity. There will be no change in the view and the Proposed Development will have no visual effect.

View 11

From local road between N72 and Rathcool Village, as the road rises on the bridge over the River Blackwater. Looking west towards the site. The site is approximately 20m distant. The view presents an elevated panorama over the site. The scrub willows and tall grasses are evident along the banks of the river and the grassland meadow is evident as the main body of the site. Midground views of the clubhouse, aircraft hangars and Air ambulance building are also evident. In the background the foothills of the Boggeragh mountains begin to rise, culminating in the distant peaks. This view has been selected as a worst case scenario view, in terms of visual exposure. The view is accessed as being of Medium level of sensitivity.

The principal change will be the introduction of elements which are more urban in nature, principally the hard surfaced landing strip as well as the new service building. This will present a medium level of change to the view resulting in a moderate and negative visual impact.

View 12

From unnamed local road approximately 140 meters to south of site, view is looking east. This tree lined local road, presents occasional glimpses towards the site, however the existing roadside vegetation significantly limits views of the site. On approach to the site it is possible that elements of the site will be evident, principally the new entrance/associated removal of hedgerow. However it is unlikely given the low elevation not views of the proposed runway will be possible. Similarly given the distance the minor loss of vegetation will be insignificant. The view is accessed as being of Medium level of sensitivity. This will present a Low-negligible level of change to the view resulting in a not significant and neutral visual impact.

Table 11.3: Review of Visual Impacts (slight, moderate, significant).

View Ref.	Predicted Viewpoint Nose Impacts for Views			
	Receptor sensitivity	Description of impact	Level of Change	Visual Impact
Location 1	Medium	No Change	N/A	N/A
Location 2	Medium	No Change	N/A	N/A
Location 3	Medium	No Change	N/A	N/A
Location 4	Medium	No Change	N/A	N/A
Location 5	Medium	No Change	N/A	N/A
Location 6	High	No Change	N/A	N/A
Location 7	Medium	Negligible	Not Significant	Neutral
Location 8	Medium	Low	Not Significant	Neutral
Location 9	Medium	No Change	N/A	N/A
Location 10	High	No Change	N/A	N/A
Location 11	Medium	Medium	Moderate	Negative
Location 12	Medium	Low- Negligible	Not Significant	Neutral

11.5.4 Potential Cumulative Impacts

A number of the identified impacts can also act cumulatively with other impacts from developments in the locality. The current Cork County Development Plan 2022-2028 identifies modest residential development within Rathcool over the lifetime of the current plan.

The lands to the east and west of the existing residential estate Radharc na Coillte are currently zoned as Open Space/Agriculture. The likely cumulative impacts on the landscape are therefore limited but may include the further loss of existing vegetation; tree and hedgerows.

It is expected that views would be restricted from all cardinal points due to the existing topography as well as screening vegetation provided by existing trees and hedgerows.

The cumulative effect is therefore considered to be Negligible as it will most often be viewed in isolation or occasionally in conjunction with other distant and predominantly residential dwellings.

11.5.5 “Do Nothing” Impact

If the proposed development was not to proceed, the lands would remain in use by the current occupants and the landscape and visual impact would likely remain unchanged. The existing vegetation adjoining the road to the east of the site would still be pollarded (reduced to 2 meters in height) as part of regular site maintenance.

The Do-Nothing scenario is likely to have some level of change associated with regular maintenance and would be considered to have a neutral impact in the context of landscape and visual impact change.

11.6 Avoidance, Remedial & Mitigation Measures

11.6.1 Construction Phase

The Proposed Development will be visible during the construction phase. The provision of site hoarding along the property boundaries will also be visible. Construction machines may become visible from neighbouring properties and also from a number of more distant vantage points as the development proceeds. The machines and site facilities are generally viewed as a temporary and unavoidable feature of construction.

Mitigation measures proposed during the construction stage of the Proposed Development, revolve primarily around the implementation of appropriate site management procedures during the construction works – such as the control of lighting, storage of materials, placement of compounds, control of vehicular access, and effective dust and dirt control measures, etc. The Construction and Environmental Management Plan for the project, submitted with the planning application, sets out the basic measures to be employed in order to mitigate potential negative effects during construction. This is a working document which is refined and added to as the project proceeds.

11.6.2 Operational Phase

The designed scheme seeks to facilitate safer emergency airlift access. The design rationale and detail employed seeks to mitigate potential negative effects on the landscape character and visual amenity of the area by:

- Minimising lighting
- The insertion, and positioning of the proposed building close to the existing local road in order to assist in the visual assimilation of their mass;
- Use of appropriate materials. The buildings’ external envelopes will consist primarily of steel and will appear visually similar to agricultural type buildings

11.6.3 “Worst Case” Scenario

Having undertaken the above review of the proposed development, we are satisfied that the proposed changes meet with commonly used Guidance and standards.

The precautionary principle has been applied throughout this assessment, and the worst-case scenario has been accounted for.

11.7 Residual Impacts

Site screening, the design of buildings and the selection of materials will minimise visual contrasts arising from colour, scale or configuration. The screening afforded by the layout of the entrance, in particular will minimise views of the site interior. The Landscape Design Drawing (See Appendix 11.1) Describes the landscaping measures that will be used to further screen the project.

11.8 Monitoring

Several hedgerows (as indicated in the landscape drawings see appendix 11.1) will require annual maintenance to retain the existing vegetation at a maximum of 2 meters in height.

The success of the proposed development is dependent on the proposals being properly executed as approved. Detailed agreement on finishes and materials to be employed needs to be ensured through the provision of and on-going adherence to reference samples provided on site for the duration of the construction works period.

11.9 Interactions

It is important to note that the proposed design has responded to the requirement to lower the height of the existing hedgerows (to maintain critical flight paths) by adding supplementary species throughout these affected hedgerows, more suitable to regular pruning. In this regard this chapter on Landscape and Visual impacts also interact with Biodiversity in Chapter 5.

11.10 Difficulties Encountered When Compiling

Due to the rural nature of the site and the quantity of residential dwellings it was not possible to capture views from all residential receptors.

12 ARCHAEOLOGY AND CULTURAL HERITAGE

12.1 Introduction

This chapter assesses the potential impacts of the Proposed Development, as described in Chapter 1 of the EIAR, on the known and potential cultural heritage resource concerning the integrity, continuity and context of same for future generations. The cultural heritage resource encompasses several aspects of tangible assets (immovable: archaeological sites and monuments, architectural heritage structures; movable: artefacts; and underwater: shipwrecks, submerged features) and intangible assets (such as historical associations, folklore, oral tradition and language).

12.1.1 Quality Assurance and Competency of Experts

This chapter was prepared by John Cronin, David Murphy and Tony Cummins of John Cronin and Associates. Mr. Cronin holds qualifications in Archaeology (B.A. University College Cork (UCC), 1991), Regional and Urban Planning (MRUP (University College Dublin (UCD) 1993), post-graduate qualifications in Urban and Building Conservation (MUBC (UCD), 1999). Mr. Murphy holds a primary degree in Archaeology (B.A. 2003, UCC) and has been approved as a licence eligible archaeologist by the National Monuments Service, Department of Housing, Local Government and Heritage. Mr. Cummins holds primary and postgraduate qualifications in Archaeology (B.A. 1992 and M.A 1994, UCC) and is also a licence-eligible archaeologist. Each of these individuals have extensive experience in the compilation of archaeological, architectural, and cultural heritage impact assessments.

12.2 Study Methodology

The assessment was informed by detailed desktop research combined with field surveys and programmes of archaeological test trenching within the boundary of the Proposed Development site. These studies and site investigations were carried out in order to identify any features of cultural heritage significance likely to be impacted by the Proposed Development. The recorded and potential cultural heritage resource within a study area encompassing the Proposed Development site and the surrounding lands extending for 1km in all directions from its boundary was reviewed in order to compile a comprehensive cultural heritage context for the location of the Proposed Development and its surrounds.

The following sub-sections present an overview of the methodology applied to identify the baseline cultural heritage resource within the study area and to inform the assessment of potential effects on elements of this resource.

12.2.1 Relevant Guidelines

The guidelines relevant to this assessment include the *Architectural Heritage Protection: Guidelines for Planning Authorities* (Department of Arts, Heritage and Gaeltacht 2011) and the *Framework and Principles for the Protection of Archaeological Heritage* (Department of Arts, Heritage, Gaeltacht and the Islands 1999). The assessment was also informed by the Environmental Protection Agency (EPA 2022) *Guidelines on the information to be contained in Environmental Impact Assessment Reports* and the International Council on Monuments

and Sites (ICOMOS 2011) *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*.

12.2.2 Desktop Research

Documentary research on the recorded and potential cultural heritage resource within the study area was carried out in order to identify any recorded archaeological, architectural and other cultural heritage sites and features. This information has provided an insight into the development of the study area over time and also assisted in an evaluation of the potential presence of hitherto unrecorded cultural heritage sites or features within the Proposed Development site.

The principal sources reviewed for the assessment of the recorded archaeological resource were the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP) maintained by the Department of Housing, Local Government and Heritage. The current Cork County Council Record of Protected Structures (RPS) and structures/lands listed in the National Inventory of Architectural Heritage (NIAH) were reviewed in order to assess the designated architectural heritage resource within the study area.

Other sources consulted as part of the assessment included the following:

- Cork County Development Plan 2022-2028: This publication outlines the Council's policies for the protection of the archaeological and architectural heritage resource within the county and includes the Record of Protected Structures (RPS) and Architectural Conservation Areas (ACAs);
- Archaeological Inventory of County Cork (Volume 4: North Cork): This publication dates to 2000 and presents summary descriptions of the known archaeological sites within the county at that time. A review of current Sites and Monuments Record datasets published on the National Monuments Service online Historic Environment Viewer (www.archaeology.ie) was carried out in July 2025 to ascertain if any archaeological sites have been identified within the study area identified since the publication of the inventory;
- World Heritage Sites and Tentative List: A review was undertaken of the locations of the two World Heritage Sites in Ireland as well as other sites included in a Tentative List (2022) nominated by Ireland for consideration as world heritage status;
- Database of Irish Excavation Reports: This database contains summary accounts of licensed archaeological excavations carried out in Ireland (North and South) from 1970 to present. Current data was accessed via www.excavations.ie in July 2025;
- Heritage Council's Heritage Map Viewer: This online mapping resource (www.heritagemaps.ie) collates various cultural heritage datasets sourced from, among others, the National Monuments Service, National Museum of Ireland, Local Authorities and the Office of Public Works;
- Literary Sources: Published literary sources consulted to assess the archaeological, historical, architectural heritage and folklore record of the study area are listed in Section 12.11 of this chapter;
- Cartographic sources: Available cartographic depictions of the study area dating from the 17th century onward were reviewed and relevant extracts are presented in Section 12.3 of this chapter;

- Aerial/Satellite imagery: A review of publicly accessible imagery from Tailte Éireann, Google Earth, and Bing Maps was carried out to appraise whether images display evidence for traces of any unrecorded archaeological sites within the Proposed Development site or its environs;
- Placenames Database of Ireland: This online database (www.logainm.ie) provides a comprehensive management system for data, archival records and place names research conducted by the State; and
- Irish National Folklore Collection: Transcribed material from the National Folklore Collection archive which has been digitised and published online at www.duchas.ie.

12.2.3 Site Inspection

The Proposed Development site was subject to field-walking inspections in January and March 2022 and March 2023 and no access constraints were encountered. The lands were assessed in terms of existing land use, any remnants of historic structures or landscaped features, vegetation cover and the potential for the presence of previously unrecorded archaeological or structures of architectural heritage interest. The results of the site inspection are described in Section 12.3 of this chapter.

12.2.4 Archaeological Test Trenching

A programme of archaeological test trenching within the footprint of the Proposed Development was carried out by John Cronin and Associates (JCA) in March 2023 (Licence 23E0159). A programme of archaeological test trenching was also carried out within the south end of the Proposed Development site in 2015 (Licence 15E0446). The aim of these programmes of test trenching was to ascertain if any potential unrecorded, subsurface archaeological features existed within the investigated areas.

The results of the programmes of test trenching are summarised in Section 12.3 of this chapter and fully copies of the reports on these site investigations are provided in Appendices 12.1 and 12.2, which include photographic records. Reports on the test trenching site investigations have also been submitted to Cork County Council, the National Monuments Service and the National Museum of Ireland.

12.2.5 Consultation

JCA consulted with the Cork County Council Archaeologist in August 2024 in relation to the formulation of the mitigation measures detailed in Section 12.6 of this chapter.

12.2.6 Assessment of Impacts

The methodology used for the assessment of potential impacts has been informed by the Environmental Protection Agency (EPA) *Guidelines for Information to be Contained in EIAR* (2022), in accordance EIA requirements of codified EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended).

The following summation of the criteria used to assess impacts is provided to concisely outline the methodology specifically applied to the cultural heritage resource. The assessment of the significance of potential impacts is achieved by a consideration of the duration, quality, type, value and magnitude of effect(s) on the cultural heritage resource:

The *Duration of Effect* is assessed based on the following criteria:

- Momentary (seconds to minutes);
- Brief < 1 day;
- Temporary <1 year;
- Short-term 1-7 years;
- Medium Term 7-15 years;
- Long Term 15-60 years;
- Permanent > 60 years; and
- Reversible: Effects that can be undone through remediation or restoration.

The *Quality of Effect* on the cultural heritage resource can be described as follows:

- Positive: a change which improves the quality of the cultural heritage environment (e.g. increasing amenity value of a site in terms of managed access, signage, presentation etc. or high-quality conservation and re-use of an otherwise vulnerable derelict structure);
- Neutral: no change or effects that are imperceptible, within the normal bounds of variation for the cultural heritage environment; and
- Adverse: a change which reduces the quality of the cultural heritage resource (e.g. visual intrusion on the setting of a site and/or physical intrusion on features/setting of a site).

The *Type of Effect* on the cultural heritage resource can be described as following:

- Direct Effect: where a cultural heritage site is physically located within the footprint of a proposed development, which will result in its complete or partial removal;
- Indirect Effect: Effects on the setting of the cultural heritage environment often produced away from the footprint of a proposed development site or because of a complex pathway;
- None predicted: where a proposed development will not adversely or positively affect a cultural heritage site.
- Cumulative: Effects The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects;
- 'Do-nothing Effects': The cultural heritage environment as it would be in the future should the project not be carried out;
- 'Worst-case' Effects: The effects arising from a Project in the case where mitigation measures substantially fail;
- Irreversible Effects: When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost; and
- Residual Effects: The degree of environmental change that will occur after the proposed mitigation measures have taken effect.

The *Magnitude of Effect* is based on the degree of change, incorporating any mitigation measures, and is based on a consideration of the character, duration, probability and consequences (Table 12.1). The magnitude can be negative or positive and is ranked without regard to the value of the asset according to the following scale: High; Medium; Low and Negligible. The descriptions of magnitudes presented in Table 12.1 are based on guidance

published in *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011).

Table 12-1: Magnitudes of Effect on Cultural Heritage Assets

Magnitude	Description
High	Most or all key archaeological or architectural materials affected such that the resource is totally altered. Comprehensive changes to setting. Changes to most or all key historic landscape elements, parcels or components; extreme visual effects; fundamental changes to use or access; resulting in total change to historic landscape character. Major changes to area that affect Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Medium	Changes to many key archaeological or historic building materials/elements such that the resource is clearly/significantly modified. Considerable changes to setting that affect the character of the archaeological asset. Changes to the setting of a historic building, such that it is significantly modified. Change to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, considerable changes to use or access, resulting in moderate changes to historic landscape character. Considerable changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Low	Changes to key archaeological materials/historic building elements, such that the resource is slightly altered/slightly different. Slight changes to setting of an archaeological monument. Change to setting of a historic building, such that it is noticeably changed. Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; slight changes to use or access; resulting in limited change to historic landscape character. Changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Negligible	Very minor changes to key archaeological materials or setting. Slight changes to historic building elements or setting that hardly affect it. Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes to use or access. Very minor changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.

The *Values* assigned to cultural heritage assets for the purposes of this assessment are intended as indicators which contribute to a wider judgment based on the individual circumstances of each example. Other than the level of legal designations, e.g., National Monuments and recognition as World Heritage sites, there is no formal grading or rating system for Irish archaeological monuments or architectural heritage structures. The non-statutory National Inventory of Architectural Heritage (NIAH) does apply a ranking system (Local, Regional, National and International) to structures included in that inventory and, while these rankings do not confer a graduated level of statutory protection they have been utilised as a value indicator for NIAH-listed structures for the purpose of this assessment.

The criteria for assessing the value of archaeological and other cultural heritage assets has been informed by the *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011, 14-16). The Value of known or potential cultural heritage assets are ranked according to the following scale: Very High, High; Medium; Low and Negligible

(Table 12.2). Generally, the more criteria that are evident for a given asset, the higher in scale its respective value is deemed to be. Criteria considered in addition to legal designations include condition / preservation; documentary / historical significance; group value; rarity; visibility in the landscape; fragility / vulnerability and amenity value.

The values assigned to identified assets within the study area were determined following the completion of the desktop study combined with site inspections and are identified in Section 12.3 of this chapter.

Table 12-2: Value Criteria for Cultural Heritage Assets

Value	Description
Very High	World Heritage Sites (including Tentative List properties). Sites, buildings or landscapes of acknowledged international importance. Intangible associations with individuals or innovations of global significance.
High	Nationally designated sites, buildings and landscapes of significant quality, rarity, preservation and importance. Undesignated assets of the quality and importance to be designated. Assets that can contribute significantly to acknowledged national research objectives. Archaeological Landscapes with significant group value. Intangible associations with individuals or innovations of national significance.
Medium	Designated or undesignated assets that can contribute significantly to regional research objectives, including buildings that can be shown to have exceptional qualities in their fabric or historical associations. Conservation Areas and historic townscapes containing buildings that contribute significantly to its historic character. Intangible associations with individuals or innovations of regional significance.
Low	Assets compromised by poor preservation and/or poor survival of contextual associations. Assets of limited value, but with potential to contribute to local research objectives. Historic Townscape or built-up areas of limited historic integrity in their buildings and settings. Intangible associations with individuals or innovations of local significance.
Negligible	Assets with very little or no surviving archaeological interest. Landscapes little or no significant historical interest. Buildings or urban areas of no architectural or historical note; buildings of an intrusive character.
Unknown	Assets whose importance has not been ascertained. Buildings with some hidden (i.e., inaccessible) potential for historic significance.

The *Significance of Effects* is assessed based on a consideration of the Magnitude of the Impact combined with the Value of the cultural heritage asset. The significance of effect can be described as Profound, Very Significant, Significant, Moderate, Slight, Not Significant or Imperceptible (Tables 12.3 and Table 12.4).

Table 12-3: Description of Significance of Effects (per EPA EIAR Guidelines 2022)

Value	Description
Imperceptible	An effect capable of measurement but without significant consequences

Value	Description
Not Significant	An effect which causes noticeable changes in the character of the environment but without significant consequences
Slight	An effect which causes noticeable changes in the character of the environment but without affecting its sensitivities
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant	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	An effect which obliterates sensitive characteristics

Table 12-4: Description of Significance of Effects (per EPA EIAR Guidelines 2022)

Magnitude of Impact	High	Not Significant/ Slight	Moderate/ Significant	Significant/ Very Significant	Very Significant/ Profound
	Medium	Not Significant	Slight	Moderate/ Significant	Significant/ Very significant
	Low	Not Significant/ Imperceptible	Slight/ Not Significant	Slight	Moderate
	Negligible	Imperceptible	Not Significant/ Imperceptible	Not Significant/ Slight	Slight
		Negligible	Low	Medium	High
Value of Asset					

12.3 The Existing and Receiving Environment (Baseline Situation)

12.3.1 Introduction

The proposed development site extends within the townlands of Rathcool and Knockcahill and is located within a level green field area to the south of the River Blackwater and to the north of Rathcool village. This area is within the parish of Dromtarriffe and the barony of Duhallow.

The following sub-sections outline the legal and planning framework relevant to the cultural heritage resource as well as the results of the desktop study and programmes of field-walking and archaeological test trenching within the Proposed Development site.

12.3.2 Legal and Planning Context

The management and protection of cultural heritage in Ireland is achieved through a framework of national laws and policies which are in accordance with the provisions of the

Valetta Treaty (1995)¹ (formally the European Convention on the Protection of the Archaeological Heritage, 1992) ratified by Ireland in 1997; the European Convention on the Protection of Architectural Heritage (Granada Convention, 1985)², ratified by Ireland in 1997; and the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, 2003³, ratified by Ireland in 2015.

The EIA Directives (from 1985 to 2014) set out the requirement for an EIA in European law. This assessment has been prepared in accordance with EIA requirements of codified Council Directive 2011/92/EU as amended by EIA Council Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended).

Ireland has transposed EU Directive 2014/52/EU by way of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 which came into operation on 1 September 2018. The Regulations provide for the transposition of the 2014 EIA Directive and give further effect to the 2011 EIA Directive by way of extensive amendments to existing planning law.

The national legal statutes relevant to this assessment include:

- Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023
- National Monuments Act 1930 (as amended);
- Heritage Act 1995 (as amended);
- National Cultural Institutions Act (1997);
- Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act (1999); and
- Planning and Development Act 2000 (as amended).

The administration of national policy in relation to archaeological heritage management is the responsibility of the National Monuments Service (NMS) which is currently based in the Department of Housing, Local Government and Heritage (DHLGH). The National Built Heritage Service (NBHS) is also based in the DHLGH, and its role includes ensuring that the architectural heritage resource is protected and carefully adapted where necessary, so that its character and special interest is maintained.

The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 was signed into law in October 2023. The DHLGH published an online guidance document in relation to this Act in November 2023⁴ which provides an overview of its status, and this is summarised hereafter. While the Act is now law most of its provisions will not enter into force until the Minister has made one or more “Commencement Orders”. This means that section 7 of the Act, which provides for the repeal of the National Monuments Acts 1930 (as amended) and related legislation, has not entered into force. Accordingly, the National Monuments Acts 1930 (as amended) remains in force at the time of the compilation of this assessment.

¹ <https://www.coe.int/en/web/culture-and-heritage/valletta-convention>

² <https://rm.coe.int/16800ca436>

³ <https://ich.unesco.org/en/convention>

⁴ <https://www.archaeology.ie/news/enactment-of-historic-and-archaeological-heritage-and-miscellaneous-provisions-act-2023-and>

The Historic and Archaeological Heritage and Miscellaneous Provisions Act 2023 Act also contains transitional provisions which will, if necessary, enable certain aspects of the existing National Monuments Acts 1930 (as amended) to continue in operation notwithstanding their repeal post-commencement of the Act while successor provisions are being brought fully into operation. This includes provisions enabling the Record of Monuments and Places to continue to have effect pending the establishment of a new Register of Monuments.

The National Monuments Act of 1930 (as amended), therefore, remains the primary means of ensuring the protection of the archaeological resource and includes a number of provisions that are applied to secure the protection of archaeological monuments. These include the designations of nationally significant sites as National Monuments as well listing sites in the Register of Historic Monuments, the Record of Monuments and Places, the Sites and Monuments Record as well as the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

Section 2 of the National Monuments Act, 1930 defines a National Monument as ‘a monument or the remains of a monument, the preservation of which is a matter of national importance’. The State may acquire or assume guardianship of National Monuments through agreement with landowners or under compulsory orders. The prior written consent of the Minister of Housing, Local Government and Heritage is required for any works at, or in proximity to, a National Monument in the ownership or guardianship of the State or a Local Authority, or sites which are subject to a Preservation Order. There are no National Monuments in State Care or archaeological sites subject to Preservation Orders located within the study area.

The locations of Irish World Heritage Sites (WHS) and a tentative list of sites submitted by Ireland to UNESCO in 2022 for consideration as WHS status were reviewed and none are located within the study area or within County Cork.

The National Monuments (Amendment) Act, 1994 made provision for the establishment of the Record of Monuments and Places (RMP) which comprises the known archaeological sites within the State. The RMP, which is based on the earlier Register of Historic Monuments (RHM) and Sites and Monuments Record (SMR), provides county-based lists of all recorded archaeological sites with accompanying maps. All RMP sites receive statutory protection under the National Monuments Act 1930 (as amended) and the NMS must be given two months’ notice in advance of any works proposed at their locations. The locations of the RMP sites located within the study area are identified in Section 12.3.3.

The protection of the architectural heritage resource is provided for through a range of legal instruments that include the Heritage Act 1995 (as amended) and the Planning and Development Act 2000. (as amended). The Planning and Development Act 2000 (as amended) requires all Planning Authorities to keep a ‘Record of Protected Structures’ (RPS) of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. As of the 1st January 2000, all structures listed for protection in current development plans, have become ‘protected structures’ and planning permission is required for any works to a protected structure that would affect its character. A protected structure also includes the land and other structures within its curtilage. While the term ‘curtilage’ is not defined by legislation, the Architectural Heritage Protection Guidelines for Local Authorities (Department Arts, Heritage and the Gaeltacht 2011), describes it as the parcel of land immediately associated with a structure and which is (or was) in use for the purposes of the structure. In addition, Local Authorities must provide for the preservation of places, groups of structures

and townscapes of architectural heritage significance through designation of Architectural Conservation Areas (ACAs). There are no protected structures or ACAs located within the study area.

The National Inventory of Architectural Heritage (NIAH) was established under the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999 to record architectural heritage structures within the State. While inclusion in the NIAH does not provide statutory protection to a structure it is intended to advise local authorities on compilation of their Record of Protected Structures. The NIAH also includes a Designed Landscapes and Historic Gardens Survey which comprises a non-statutory, desk-based survey of such features. There are two structures listed in the NIAH located within the surrounding study area and these are identified in Section 12.3 of this chapter.

The *Cork County Development Plan 2022-2028* includes a range of policies and objectives in relation to the protection of the cultural heritage resource within the county and these include the following objectives in relation to the protection of the archaeological resource:

HE 16-2: Protection of Archaeological Sites and Monuments

Secure the preservation (i.e. preservation in situ or in exceptional cases preservation by record) of all archaeological monuments and their setting included in the Sites and Monuments Record (SMR) (see www.archaeology.ie) and the Record of Monuments and Places (RMP) and of sites, features and objects of archaeological and historical interest generally. In securing such preservation, the planning authority will have regard to the advice and recommendations of the Development Applications Unit of the Department of Housing, Local Government and Heritage as outlined in the Frameworks and Principles for the Protection of the Archaeological Heritage policy document or any changes to the policy within the lifetime of the Plan.

HE 16-3: Underwater Archaeology

Protect and preserve the archaeological value of underwater archaeological sites and associated underwater and terrestrial features. In assessing proposals for development, the development will take account of the potential underwater archaeology of rivers, lakes, wetlands, intertidal and sub-tidal environments through appropriate archaeological assessment by a suitably qualified archaeologist.

HE 16-4: Zones of Archaeological Potential in Historic Towns and Settlements

Proposed development works in Historic Towns and settlements, Zones of Archaeological Potential, Zones of Notification and the general historic environs in proximity to the zones, should take cognisance of the impact potential of the works, and all appropriate archaeological assessments employed to identify and mitigate the potential impacts.

HE 16-5: Zones of Archaeological Potential

Protect the Zones of Archaeological Potential (ZAPs) located within historic towns, urban areas and around archaeological monuments generally. Any development within the ZAPs will need to take cognisance of the upstanding and potential for subsurface archaeology, through appropriate archaeological assessment.

HE 16-6: Industrial and Post Medieval Archaeology

Protect and preserve industrial and post-medieval archaeology and long-term management of heritage features such as mills, limekilns, forges, bridges, piers and harbours, water-related engineering works and buildings, penal chapels, dwellings, walls and boundaries, farm buildings, estate features, military and coastal installations. There is a general presumption for retention of these structures and features. Proposals for appropriate redevelopment including conversion should be subject to an appropriate assessment and record by a suitably qualified specialists.

HE 16-7: Battlefield, Ambush and Siege Sites and Defensive Archaeology

Protect and preserve the defensive archaeological record of County Cork including strategic battlefield, ambush and siege sites, and coastal fortifications and their associated landscape due to their historical and cultural value. Any development within or adjoining these areas shall undertake a historic assessment by a suitably qualified specialist to ensure development does not negatively impact on this historic landscape.

HE 16-8: Burial Places

Protect all historical burial places and their setting in County Cork and encourage their maintenance and care in accordance with appropriate conservation principles.

HE 16-9: Archaeology and Infrastructure Schemes

All large scale planning applications (i.e. development of lands on 0.5 ha or more in area or 1km or more in length) and Infrastructure schemes and proposed roadworks are subjected to an archaeological assessment as part of the planning application process which should comply with the Department of Arts, Heritage and the Gaeltacht's codes of practice. It is recommended that the assessment is carried out following pre planning consultation with the County Archaeologist, by an appropriately experienced archaeologist to guide the design and layout of the proposed scheme/development, safeguarding the archaeological heritage in line with Development Management Guidelines.

HE 16-10: Management of Monuments within Development Sites

Where archaeological sites are accommodated within a development it shall be appropriately conservation/ protection with provision for a suitable buffer zone and long-term management plan put in place all to be agreed in advance with the County Archaeologist.

HE 16-11: Archaeological Landscapes

To protect archaeological landscapes and their setting where the number and extent of archaeological monuments are significant and as a collective are considered an important archaeological landscape of heritage value.

HE 16-13: Undiscovered Archaeological Sites

To protect and preserve previously unrecorded archaeological sites within County Cork as part of any development proposals. The Council will require preservation in situ to protect archaeological monuments discovered. Preservation by record will only be considered in exceptional circumstances.

The *Cork County Development Plan 2022-2028* also includes the following objectives in relation to the protection of the architectural heritage resource within the county:

HE 16-14: Record of Protected Structures

- a) The identification of structures for inclusion in the Record will be based on criteria set out in the Architectural Heritage Protection Guidelines for Planning Authorities (2011).*
- b) Extend the Record of Protected Structures in order to provide a comprehensive schedule for the protection of structures of special importance in the County during the lifetime of the Plan as resources allow.*
- c) Seek the protection of all structures within the County, which are of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. In accordance with this objective, a Record of Protected Structures has been established and is set out in Volume Two Heritage and Amenity, Chapter 1 Record of Protected Structures.*
- d) Ensure the protection of all structures (or parts of structures) contained in the Record of Protected Structures.*
- e) Protect the curtilage and attendant grounds of all structures included in the Record of Protected Structures.*
- f) Ensure that development proposals are appropriate in terms of architectural treatment, character, scale and form to the existing protected structure and not detrimental to the special character and integrity of the protected structure and its setting.*

g) Ensure high quality architectural design of all new developments relating to or which may impact on structures (and their settings) included in the Record of Protected Structures.

h) Promote and ensure best conservation practice through the use of specialist conservation professionals and craft persons.

i) In the event of a planning application being granted for development within the curtilage of a protected structure, that the repair of a protected structure is prioritised in the first instance i.e. the proposed works to the protected structure should occur, where appropriate, in the first phase of the development to prevent endangerment, abandonment and dereliction of the structure.

HE 16-15: Protection of Structures on the NIAH

Protect where possible all structures which are included in the NIAH for County Cork, that are not currently included in the Record of Protected Structures, from adverse impacts as part of the development management functions of the County.

HE 16-16: Protection of Non- Structural Elements of Built Heritage

Protect non-structural elements of the built heritage. These can include designed gardens/garden features, masonry walls, railings, follies, gates, bridges, shopfronts and street furniture. The Council will promote awareness and best practice in relation to these elements.

HE 16-17: Areas of Special Planning Control

Establish areas of special planning control within Architectural Conservation Areas where appropriate. These areas will include a scheme setting out objectives for the conservation and enhancement of the special character of the area, and will be based on an Architectural Appraisal of each town.

HE 16-18: Architectural Conservation Areas

Conserve and enhance the special character of the Architectural Conservation Areas included in this Plan. The special character of an area includes its traditional building stock, material finishes, spaces, streetscape, shopfronts, landscape and setting. This will be achieved by;

(a) Protecting all buildings, structures, groups of structures, sites, landscapes and all other features considered to be intrinsic elements to the special character of the ACA from demolition and non-sympathetic alterations.

(b) Promoting appropriate and sensitive reuse and rehabilitation of buildings and sites within the ACA and securing appropriate infill development.

(c) Ensure new development within or adjacent to an ACA respects the established character of the area and contributes positively in terms of design, scale, setting and material finishes to the ACA.

(d) Protect structures from demolition and non sympathetic alterations.

(e) Promoting high quality architectural design within ACAs.

(f) Seek the repair and re-use of traditional shopfronts and where appropriate, encourage new shopfronts of a high quality architectural design.

(g) Ensure all new signage, lighting advertising and utilities to buildings within ACAs are designed, constructed and located in such a manner they do not detract from the character of the ACA.

(h) Protect and enhance the character and quality of the public realm within ACAs. All projects which involve works within the public realm of an ACA shall undertake a character assessment of the said area which will inform a sensitive and appropriate approach to any proposed project in terms of design and material specifications. All projects shall provide for the use of suitably qualified conservation architects/ designers.

(i) Protect and enhance the character of the ACA and the open spaces contained therein. This shall be achieved through the careful and considered strategic management of all signage, lighting, utilities, art works/pieces/paintings, facilities etc to protect the integrity and quality of the structures and spaces within each ACA.

(j) Ensure the protection and reuse of historic street finishes, furniture and features which contribute to the character of the ACA.

HE 16-19: Vernacular Heritage

- a) Protect, maintain and enhance the established character, forms, features and setting of vernacular buildings, farmyards and settlements and the contribution they make to our architectural, archaeological, historical, social and cultural heritage and to local character and sense of place.*
- b) Cork County Council encourages best conservation practice in the renovation and maintenance of vernacular buildings including thatched structures through the use of specialist conservation professionals and craft persons. Development proposals shall be accompanied by appropriate documentation compiled by experienced conservation consultant.*
- c) There will generally be a presumption in favour of the retention of vernacular buildings and encouragement of the retention and re-use of vernacular buildings subject to normal planning considerations, while ensuring that the re-use is compatible with environmental and heritage protection.*

HE 16-20: Historic Landscapes

- a) Recognise the contribution and importance of historic landscapes and their contribution to the appearance of the countryside, their significance as archaeological, architectural, historical and ecological resources.*
- b) Protect the archaeological, architectural, historic and cultural element of the historic/heritage landscapes of the County of Cork.*
- c) All new development within historic landscapes should be assessed in accordance with and giving due regard to Cork County Councils 'Guidance Notes for the Appraisal of Historic Gardens, Demesnes, Estates and their Settings' or any other relevant guidance notes or documents issued during the lifetime of the Plan.*

The Development Plan also includes policies and objectives in relation to the protection of the cultural heritage resource within the county, including aspects such as the cultural heritage of the county (HE 16-23: Cultural Heritage), linguistic heritage (HE 16-22: Gaeltacht Areas), placenames (HE 16-24: Naming of New Developments) and the arts (HE 16-26: The Arts).

12.3.3 Desktop Study

12.3.3.1 Archaeological and Historical Context

This sub-section identifies the recorded archaeological sites located within the study area. Datasets have been interrogated and retrieved largely from State organisations and are considered accurate and current per publicly available information. Brief overviews of the main Irish archaeological periods are provided for the general reader and the dating framework used for these is based on the *Guidelines for Authors of Reports on Archaeological Excavations* published by the National Monuments Service (2006). There are nine recorded archaeological sites located within the study area and a section of one of these sites, a levelled ringfort (CO030-145----), extends within the boundary of the Proposed Development (Table 12.5 and Figures 12-1 and 12-5).

None of the archaeological sites within the study area are designated as National Monuments in State Care or have been assigned Preservation Orders but they are subject to protection under the National Monuments Act 1930 (as amended).

As described below, a number of the archaeological sites within the surrounding study area have been recorded not retaining any visible surface traces by the Archaeological Survey of Ireland. However, all archaeological sites, including levelled examples, have the potential to possess sub-surface features, artefacts, human burials and other archaeological remains that may be of High or Very High values. While this cannot be ascertained without recourse to archaeological excavation, such attributes are unlikely to be subject to adverse effects in the absence of any proposed works that would result in direct effects on their locations.

Table 12-5: Recorded Archaeological Sites Within Study Area

Monument No.	Classification	Townland	Distance from Proposed Development
CO030-133----	Ringfort - rath	Killetragh	920m northwest
CO030-135----	Ringfort - rath	Killetragh	990m northwest
CO030-138----	Fulacht fia	Killetragh	610m northwest
CO030-145----	Ringfort - rath	Rathcool	Within
CO030-146----	Earthwork	Rathcool	530m southeast
CO030-147----	Ringfort - rath	Rathcool	510m southeast
CO030-231----	Church	Boolyamore	880m southeast
CO030-247----	Bridge	Rathcool, Dromahoe	Adjacent
CO039-021002-	Kiln - lime	Prohus	965m southwest



Figure 12-1 Archaeological Sites (red dots), Zones of Notification (cyan) and NIAH structures (yellow labels) Within Study Area

Prehistoric Periods

Until the recent identification of Palaeolithic human butchery marks on animal bones recovered from cave sites in Munster, the earliest recorded evidence for human activity in Ireland dated to the Mesolithic period (7000–4000 BC) when groups of hunter-gatherers lived on the heavily wooded island. The archaeological record indicates that these mobile groups tended to favour coastal, lake and river shores which provided a transport resource and also provided elements of their varied diet. These groups did not construct any settlements or monuments that have left above ground traces although their presence in an area can often be identified by scatters of worked flints in ploughed fields or during earth-moving works undertaken as part of development projects. The Neolithic period (4000-2400 BC) began with the arrival and establishment of agriculture as the principal form of economic subsistence, which resulted in more permanent settlement patterns in farmlands within areas of cleared forestry. As a consequence of the more settled nature of agrarian life, new site-types, such as more substantial rectangular timber houses and various types of megalithic tombs, begin to appear in the archaeological record during this period.

Metalworking arrived in Ireland with the advent of the Bronze Age period (c. 2400–500 BC) and saw the introduction of a new artefactual assemblage and was also associated with the construction of new monument types such as standing stones, stone rows, stone circles and burnt mounds known as fulachta fiadh. The development of new burial practices during this period also saw the construction of funerary monuments such as wedge tombs, cairns, barrows, ring-ditches, boulder burials and cists. The arrival of iron-working technology in Ireland saw the advent of the Iron Age (600 BC – 400 AD). This period has traditionally been associated with a Celtic ‘invasion’, although recent archaeological evidence points instead to a gradual development following centuries of contacts with Celtic-type cultures in Europe. Relatively little was known about Iron Age settlement and ritual practices in Ireland until recent decades when the corpus of evidence has been greatly increased by the discovery of sub-surface sites dating to this period during archaeological investigations carried out as part of development projects.

There is one recorded prehistoric site located within the study area and this comprises a fulacht fia (CO030-138----). These sites comprise spreads or mounds of burnt stones within charcoal-rich deposits and are generally interpreted as the remains of cooking sites, although other interpretations have also been postulated. They functioned by placing fire-heated stones into a water-filled trough in order to raise the water to boiling point and the mounds gradually built up from material cleaned out from the trough after each use. They are one of the most numerous sites in the Irish archaeological record and are typically located near or adjacent to natural water sources, such as streams, springs or marshy areas. Archaeological evidence indicates that this process may have originated in the Neolithic period but did not become widespread until the Bronze Age. While many examples have been levelled by ploughing or land improvement works, in their undisturbed form they can comprise horseshoe-shaped mounds with a central water trough. The example within the study area has been described by the Archaeological Survey of Ireland as follows:

Fulacht Fiadh CO030-138----

In rough grazing. Grass-covered spread of burnt material, partially covered by farm trackway. Bowman (1934, 333) noted that 'the surface stones have been removed'.

Early Medieval Period

The early medieval (c. 400–1169 AD) period in Ireland broadly commences with the arrival of Christianity to Ireland. While this period saw the emergence of the first phases of urbanisation around the large monasteries and the Hiberno-Norse ports the dominant settlement pattern of the period continued to be rural-based and centred on enclosed farmsteads known as ringforts and their stone-built equivalents known as cashels. The ubiquity of these enclosures within the Irish landscape is attested to by the fact that their original Gaelic names (rath, lios and dun) still form some of the most common placename elements in the country. Archaeological excavations have demonstrated that the majority comprised enclosed farmsteads containing evidence for occupational, agricultural and craft/industrial activities. There are four recorded ringforts located within the study area and one of these (CO030-145----) comprises a levelled example which partially extends within the boundary of the Proposed Development. None of the other ringforts in the study area are located within 500m of the boundary of the Proposed Development.

The study area also contains the recorded locations of an earthwork (CO030-146----) and a church site (CO030-231----) and while the potential exists that these two sites originated in the early medieval period this cannot be confirmed without recourse to archaeological excavation.

The Archaeological Survey of Ireland have published the following inventory descriptions of the ringforts, earthwork and church site within the study area:

Ringfort CO030-133----

In pasture, on S-facing slope. Depicted as hachured circular enclosure (diam. c. 30m) on 1842 OS 6-inch map, with lime kiln on SE side. Levelled; no visible surface trace. Recorded by Bowman (1934, 332) as levelled single-ramparted fort (diam. c. 37yd) on Mrs. Singleton's land.

Ringfort CO030-135----

In pasture, on gentle S-facing slope. Depicted as hachured arc of bank W->N on 1937 OS 6-inch map, immediately outside and skirting curving field fence. Arc formed by two heavily overgrown earthen banks (inner bank: int. H 0.7m; outer bank: ext. H 0.4m) survives W->NE with intervening fosse and shallow external fosse (D 0.25m); low rise continues line of inner bank NE->ESE. Intervening fosse inaccessible due to overgrowth. Inner bank incorporated into field boundary system W->NE. Locally known as remains of fort. Recorded by Bowman (1934, 332) as single-ramparted fort (diam. c. 28yd) in Cornelius O'Keeffe's land; bank c. 4ft high; fosse infilled.

Ringfort CO030-145----

In pasture, on gentle N-facing slope. Depicted as hachured circular enclosure (diam. c. 40m) on 1842 OS 6-inch map. Levelled roadway running NE-SW transects enclosure. On NW side of road is raised area (C c. 22m NE-SW), scarp most clearly defined to W; no visible surface trace of site to SE of roadway. Recorded by Bowman (1934, 357) as one of two levelled single-ramparted forts (CO030-147----) on Mr McCarthy's land; (diam. '39 yards and 34 yards').

Ringfort CO030-147----

In pasture, atop natural rise at W side of new line of Owenbaun River. Depicted as hachured circular enclosure (diam. c. 50m) on 1842 OS 6-inch map. Natural scarp to S appears to defines area of site on S side; low rise (int. H 0.5m; ext. H 0.3m) to N may mark line of levelled bank. According to Bowman (1934, 357) one of two levelled single-ramparted forts (CO030-145----) on Mr McCarthy's land.

Earthwork CO030-146----

On W bank of realigned Owenbaun River, originally 150m further to E. Named 'Rath' on 1937 OS 6-inch map and shown as hachured scarp N->S, with second concentric scarp N->E. Site overgrown and used as dump for farmyard manure; area defined to N by stone field boundary, to E by drainage canal and to S by sunken farm trackway. Within site are a number of low earthen banks (H c. 0.6m; Wth c. 2m), partially overgrown and incomplete, which seem to be part of two E-W rectangular structures. According to local tradition, site of church and burial ground. Recorded by Bowman (1934, 357) as 'church site' in Mr McCarthy's land, 'in field called the graveyard. Fence levelled. Site c. 2ft higher than field level...circular. diam. 35yd. mainly grass covered mounds'.

Church CO030-231----

Bowman (1934, 352) recorded church site and burial ground in John Bourke's land, in field called 'The killeens...The actual site of the church is still discernible - being marked by grass covered mounds - and measure 26 feet by 19 feet. No sign of graves are now to be seen'. Two fields c. 400m S of Boolymore House known as 'Upper Killeen' and 'Lower Killeen'. No visible surface trace of church or burial ground here.

High, Late and Post Medieval Periods

The arrival and conquest of large parts of Ireland by the Anglo-Normans in the late 12th century broadly marks the advent of the high medieval period which continued to c.1400 AD, which was followed by the late medieval period which extended to c.1550 AD. These periods saw the continuing expansion of Irish urbanisation as many of the port cities developed into international trading centres and villages and towns began to develop as local or regional market centres. While masonry castles were already in existence, the descendants of the Anglo-Norman gentry began the widespread construction of tower-houses as fortified residences within their landholdings at the start of the 15th century and this trend was subsequently adopted by wealthy Irish families within areas under Gaelic control.

The centuries following AD 1550 are referred to as the post-medieval period, which is generally considered to continue into the mid-19th century and the period thereafter is described as early modern. These periods saw the continuing expansion of Irish urbanisation as many of the port cities developed into international trading centres and numerous villages and market towns began to develop throughout the country. The early part of the post-medieval period was a turbulent time in Irish history and in the later decades of the 16th century the Tudors sought to re-assert English control over the country. The resultant wars between the 1560s and 1603 brought this unsettled period to a temporary end although further widespread strife ensued during the Cromwellian Wars (1649–53) which ended with extensive dispossession of forfeited Gaelic lands. An agricultural boom in the late 18th and early 19th centuries saw a rise in prices for agricultural produce which resulted in landlords investing in extensive land improvement works within their holdings to increase land productivity. This included the extensive enclosure of open lands into field systems that survive to the present-day.

The post-medieval period also saw the development of high and low status stone houses throughout the Irish countryside and rural settlement clusters at this time typically consisted of single-storey thatched cottages with associated farm buildings while two-storey farmhouses became more common in the 19th century. The settlement pattern throughout much of the rural landscape was greatly affected by the famine period during the middle of the 19th century and subsequent decades saw an intensification of agricultural practices which was further increased by the advent of mechanised farming practices in the 20th century.

The study area contains two recorded archaeological sites of late 19th century date, and these comprise a road bridge (CO030-247----) spanning a section of the River Blackwater outside the northeast end of the Proposed Development site and a lime kiln (CO039-021002-) in the west end of the study area. These sites have been described by the Archaeological Survey of Ireland as follows:

Bridge CO030-247----

Road bridge (Wth 7.7m; long axis NNW-SSE) over River Blackwater. Random ashlar (local sandstone) construction with rock-faced finish. Five large segmental arches, cut and dressed limestone voussoirs, limestone string course. Bluntly pointed limestone cutwaters. Parapet wall on roadside of coursed ashlar limestone, with coping of flat limestone slabs. Plaque on W parapet reads "1858/Colthurst Bridge/Watrag/Surveyor/M. Forrest/Contractor".

Lime Kiln CO039-021002-

Lime kiln survives but inaccessible due to overgrowth. Indicated on 1904 OS 6-inch map adjacent to reservoir with pump house and chimney. Pump house and chimney no longer survive.

Samuel Lewis's *A Topographical Dictionary of Ireland* (1837) provides descriptions of Irish parishes during the 1830s which can include information on contemporary land use patterns, historical events as well as the presence of notable archaeological sites or structures of architectural heritage interest such as country houses and churches. The description of Dromtariffe Parish does not contain any references to the Rathcoole area but in general it describes the lands in the parish as being of middling quality although efforts to improve farming conditions had greatly improved the state of agriculture in the area.

The road bridge (CO030-247----) outside the northeast end of the Proposed Development site is known as Colhurst Bridge and is named after a notable County Cork landowner family whose estate was centred in the Ballyvourney area but also contained other landholdings in the county during the 19th century, including lands within Dromtariffe parish. The NIAH record that the bridge was bombed by the Black and Tans in the early 20th century but was later repaired⁵. The Rathcoole area was the site of a notable ambush of a British Auxiliary convoy by the Irish Republican Army in June 1921. Contemporary accounts record that this event was centred on an east-west section of road to the north of Rathcoole Wood⁶ in an area located c.1.4km to the south of the Proposed Development site.

The Rathcoole Flying Club aerodrome was established within the Proposed Development site in 1962 as a recreational facility and it comprises a single grass runway, measuring c. 450m in length by 18m wide, and associated structures to the south. An Air Ambulance Service was established within the property in 2019 by the voluntary group Irish Community Air Ambulance (ICAA). This service is now operated by the Health Service Executive (HSE) and the National Ambulance Service.

12.3.3.2 Database of Irish Excavation Reports

The database contains two entries for archaeological test trenching investigations within the boundary of the Proposed Development and these are detailed in Section 12.3.5 of this chapter.

12.3.3.3 Architectural Heritage Constraints

There are no protected structures located within the Proposed Development site, or within the surrounding study area, and it is not located within an Architectural Conservation Area. There are two structures within the surrounding study area listed in the NIAH Building Survey, and these comprise Colhurst Bridge (NIAH 20903013), located outside the northeast corner of the Proposed Development, and Ardnagreine House (NIAH 20903012) is located c.335m to the north (Figure 12-1). As detailed in Section 12.3.3.1, Colhurst Bridge is also listed as an archaeological site (CO030-247----). The NIAH inventory entries for these structures describe them as follows:

Colhurst Bridge

Rating: Regional

Description: Five-arch road bridge, built 1880, over River Blackwater. Sneaked rock-faced limestone walls and parapets with limestone copings, tooled limestone string courses over arches. Segmental arches with tooled limestone voussoirs and V-cutwaters with rock-faced course at impost level of arches. Limestone plaque to parapet in form of shield. This wide bridge is a well-executed example

⁵ <https://www.buildingsofireland.ie/buildings-search/building/20903013/colthurst-bridge-dromahoe-cork>

⁶ <http://www.millstreet.ie/blog/archives/69415>

and forms part of a group of multiple-arch bridges over the River Blackwater. The masonry treatments add textural interest and were clearly executed by skilled craftsmen. The bridge is a historical landmark for the local community. It was bombed by the Black and Tans in the early twentieth century but was later repaired.

Ardnagreine House

Rating: Regional

Detached three-bay two-storey house, built c. 1910, having flat roofed single-bay return to rear and recent single-storey extension to rear of return. Pitched slate roof having decorative terracotta ridge tiles and rendered chimneystacks with terracotta chimney pots and some cast-iron rainwater goods. Painted rendered walls with painted plinth course. Square-headed window openings having timber sliding sash windows, tripartite one-over-one pane to facade and two-over-two pane single windows to rear, with painted stone sills. Replacement uPVC windows to return. Square-headed entrance doorway having decoratively half-glazed timber door flanked by fixed timber sidelights. Curved entrance gateway having painted rendered walls, square-plan inner and outer piers with caps and decorative cast-iron double-leaf gates and wrought-iron pedestrian gate. This pleasant middle sized late nineteenth century house is recessed from the road in landscaped grounds. The building retains numerous interesting features such as timber sliding sash windows, some cast-iron rainwater goods and terracotta chimney pots. The central door is highlighted by the flanking sidelights. This pleasant modest rural house is set back from the road in landscaped grounds. The building is notable for its tripartite window openings, and the retention of timber sash windows and an attractive door with sidelights. The entrance gates form a pleasant introduction to the grounds.

The NIAH Survey of Historic Gardens and Designed Landscape does not list any examples within the study area.

12.3.3.4 Review of Cartographic and Satellite/Aerial Imagery

The cartographic sources examined for the study area comprised the first edition 6-inch Ordnance Survey (OS) map published in 1844 (Figure 12-2), the 25-inch edition OS map published in 1904 (Figure 12-3) and the second edition 6-inch OS map published in 1937 (Figure 12-4). The detail on the 17th century Down Survey mapping was also reviewed and shows no structures, routeways, bridges or settlements within the environs of the study area.

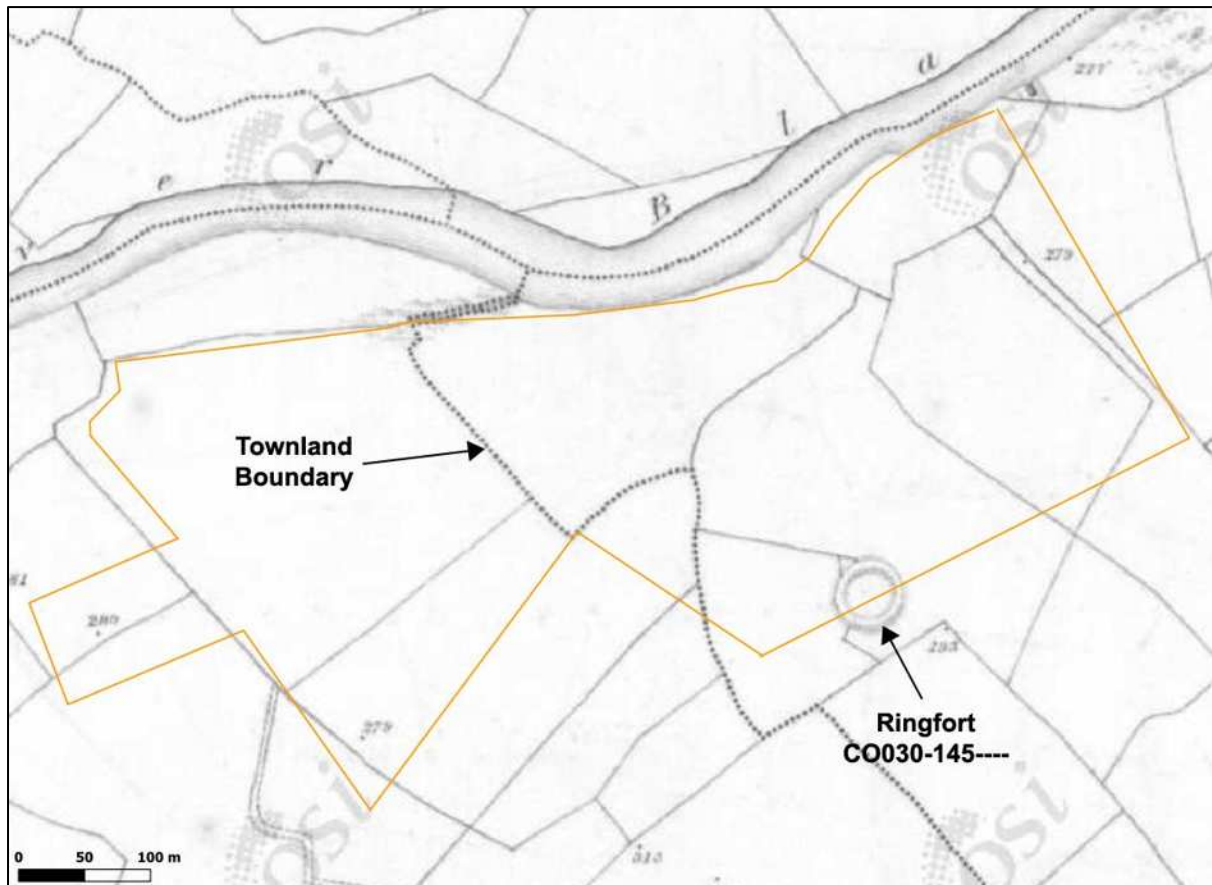


Figure 12-2: Extract from first edition 6-inch OS map (1844)

The first edition 6-inch OS map shows the location of the Proposed Development site within an enclosed pastoral landscape formed by irregularly shaped vacant fields to the south of the River Blackwater. The enclosing element of ringfort CO030-145----, the north end of which is shown extending into the Proposed Development site, is clearly depicted as a circular area measuring c.38m in diameter and includes the southern section of the enclosure which is now occupied by a public road. The map also shows a section of the townland boundary between Rathcoole and Knockcahill extending within the Proposed Development site and its line follows a number of linear and curvilinear field boundaries. The existing public roads flanking the south and east sides of the boundary of the Proposed Development are not present and there is no bridge structure over the River Blackwater shown within the environs of the site.

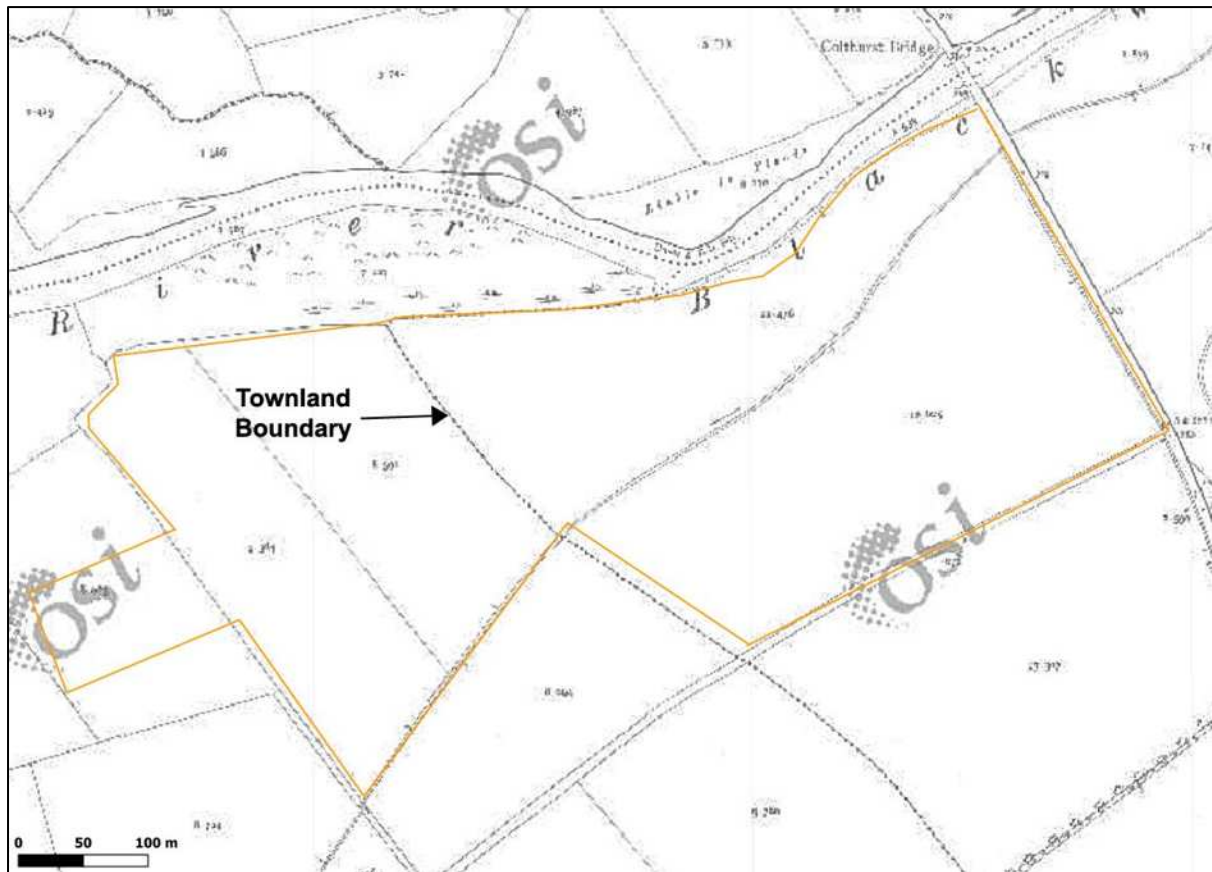


Figure 12-3: Extract from 25-inch OS map (1904)

The detail on the 25-inch OS map (1904) indicates that the surface remains of ringfort CO030-145---- had been levelled during the second half of the 19th century and that the construction of the public road to the south during that time had truncated the southern half of the site. The existing public road to the east of the Proposed Development site, including the road bridge over the River Blackwater, was also constructed during this period. The layout of the field boundaries shown within the Proposed Development site is much altered when compared to the detail on first edition 6-inch OS map with many of the irregular field divisions removed and replaced with more regular boundaries. This also resulted in an alteration to the line of the townland boundary between Rathcoole and Knockcahil within the southern half of the Proposed Development site where is now shown extending in a straight line along one of the field boundaries created during the late 19th century. A drainage channel is also depicted extending across the central area of the Proposed Development site in a southwest to northeast direction.

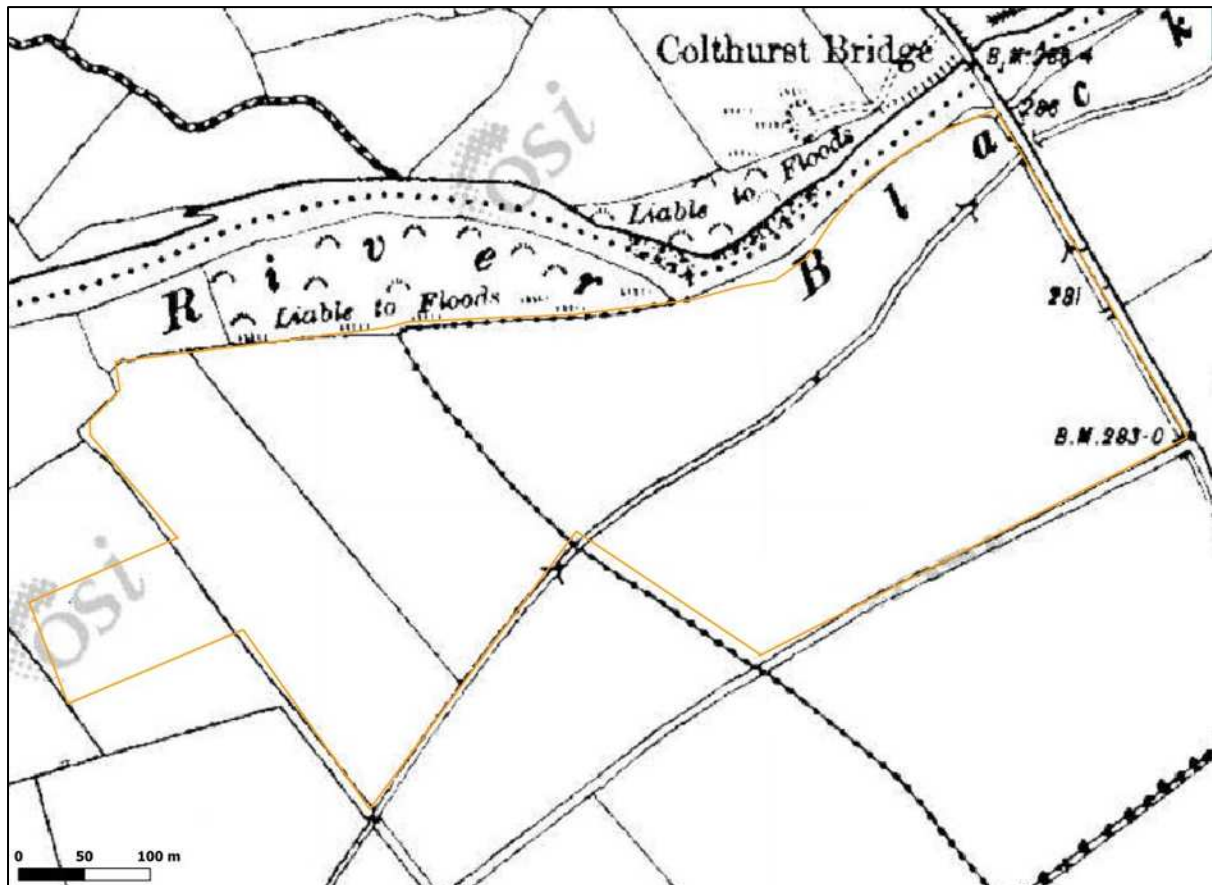


Figure 12-4: Extract from 2nd edition 6-inch OS map (1957)

The detail on the 2nd edition 6-inch OS map (1957) indicates that the layout of the Proposed Development site remained unchanged during the first half of the 20th century. The location of ringfort CO030-145---- is not indicated on this map and no structures are shown within the Proposed Development site.



Figure 12-5: Ringfort CO030-145---- visible as a dark soil-mark in area of enhanced contrast

A review of modern aerial and satellite images published online by Tailte Éireann, Google and Bing and captured between 1995-2023 revealed that a faint outline of the northern portion of the infilled enclosing ditch of the levelled ringfort (CO030-145----) is discernible as a dark soil-mark on certain images in an area which directly correlates with its location as depicted on the first edition 6-inch OS map (Figure 12-2). No potential unrecorded archaeological sites were identified within the Proposed Development site during the review of aerial/satellite imagery.

12.3.3.5 Undesignated Cultural Heritage Assets

While encompassing the designated archaeological and architectural heritage resources, cultural heritage also includes various undesignated assets such as settlements, demesne landscapes, vernacular structures, folklore, cultural traditions, historical associations and place names. There are no historic settlements, vernacular structures or demesne features located within the Proposed Development site and no associations with notable historical events within its boundary were identified. The online archive of the National Folklore Collection (www.duchas.ie) was consulted and contains no records of folklore or traditions associated with potential unrecorded cultural heritage assets associated with the Proposed Development site.

The Proposed Development extends into the townlands of Rathcool and Knockcahill. Townlands are the smallest unit of land division in the Irish landscape, and many may preserve early Gaelic territorial boundaries that pre-date the Anglo-Norman conquest. The boundaries

and names of Irish townlands were recorded and standardised by the Ordnance Survey in the 19th century. The Irish origins of townland names often refer to natural topographical features, but some name elements may also give an indication of the presence of past human activity within the townland, e.g., *lios*, *rath* or *dun* may indicate the presence of a ringfort while *temple*, *saggart*, *termon* or *kill* indicate associations with church sites. The townland name Rathcoole is an anglicisation of the Irish name *Ráth Cúile*, which has been translated as 'rath/fort of the corner or angle'.⁷ This name may be associated with the levelled ringfort (CO030-145----) located within the Proposed Development site, although the potential also exists that it may also refer to a number of other recorded ringforts within the townland. The west end of the Proposed Development site extends into Knockcahill townland which is an anglicisation of *Cnoc Chathail* (Cahill's hill) and does not suggest an association with a potential unrecorded archaeological site.

12.3.4 Site Inspection

The Proposed Development site was subject to field-walking inspections in January and March 2022 and March 2023. The site is bound by the River Blackwater to the north, local third-class public roads to the east and south, a plantation of coniferous forestry to the southwest and agricultural pasture fields to the west. It comprises an area of green field lands with an existing grass runway located in the northern portion which is aligned in an east-northeast to west-southwest direction. The existing modern facilities of the Rathcoole Flying Club and the HSE Air Ambulance are located in the south-eastern corner of the property. The Proposed Development also extends into two level pasture fields to the west to facilitate a proposed runway extension.

The location of the existing grass runway comprises a generally level area of grassland contained within one large field. There is gentle rise in topography to the south towards the existing aerodrome facilities but in general the ground surface within the site is level and was under low grass growth at the time of inspection. A cut drainage channel extends through the field in a northeast to southwest direction and has been culverted at the location where it intersects with the runway. The existing drainage channel follows the line of a field drain depicted on the 25-inch OS map (1904). This drain is not shown on the 1st edition 6-inch OS map (1844) and may be associated with late 19th century land improvement works which also entailed the removal of field boundaries shown on the 1844 OS map (see Section 12.3.3.4).

An inspection of the location of the northern section of the levelled ringfort (CO030-145----) that extends into the south end of the Proposed Development site revealed that the slightly raised area described in the Archaeological Survey of Ireland inventory description of this site is still discernible at ground level (see Section 12.3.3.1). No surface traces of the enclosing bank or ditch were visible, and it is possible that the raised area at the location was created by upcast material from the construction of the adjoining public road through the southern end of the ringfort during the late 19th century.

12.3.5 Archaeological Test Trenching

A programme of archaeological testing within the footprint of the Proposed Development was carried out March 2023 (Excavation Licence 23E0159) as part of a previous planning

⁷ <https://www.logainm.ie/en/12742>

application (CCC ref.: 22/06397). A full copy of the report on the results of this archaeological site investigation is provided in Appendix 12.1.

This site investigation entailed the excavation of seven 2m wide linear archaeological test trenches, ranging between 20m and 200m in length (total length 470m), within accessible areas of the Proposed Development site (Figure 12-6). A metal-detector was used to assist in artefact retrieval as part of the site investigation (Detection Licence 23R0092). The location of the existing grass runway within the Proposed Development was not available for excavation works during the programme of archaeological test trenching.

Trenches 1, 2 & 3 were excavated within an area located to the west of the levelled ringfort (CO030-145----) and no traces of any features associated with the ringfort were identified within these trenches. Trench 4 was excavated along the line of the taxiway extending from the existing hangar facilities to the north-eastern end of the proposed realigned runway. Trenches 5, 6, and 7 were excavated along the line of the proposed runway alignment.

No traces of any potential archaeological remains were revealed in any of the test trenches.

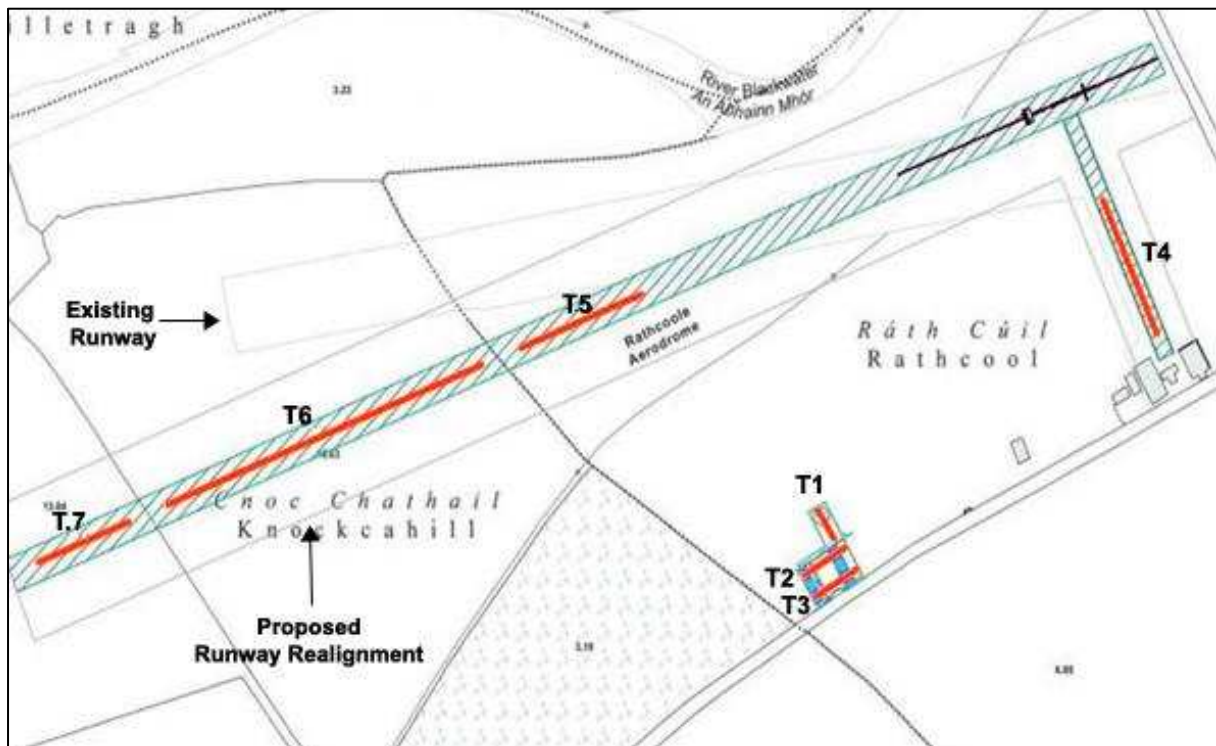


Figure 12-6 Location of Test Trenches Excavated in 2023 (shown in red)

An earlier programme of archaeological test trenching was carried out within south end of the Proposed Development site as part of an application to develop an administrative building (CCC Planning ref. 15/05370) in an area located 30m to the east of the levelled ringfort (CO030-145----). The six 1.8m wide test trenches were excavated with a toothless grading bucket down to the surface of the undisturbed natural subsoil (Figure 12-7). There were no archaeological objects of any date noted within any of the test trenches or during inspections of the upcast topsoil and no potential archaeological features were identified in the exposed natural subsoil layer. A copy of the report on this programme of archaeological test trenching is provided in Appendix 12.2.

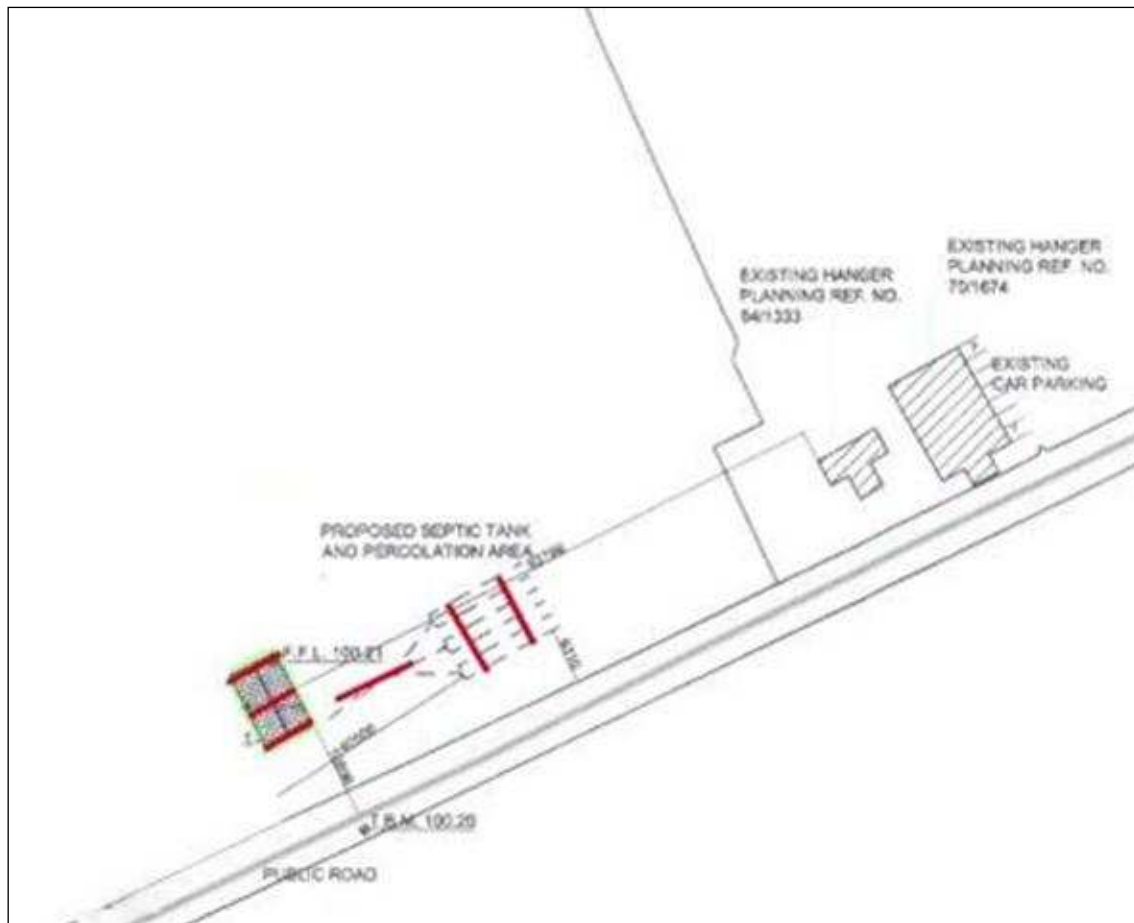


Figure 12-7 Location of Test Trenches Excavated in 2015 (shown in red)

12.4 Characteristics of the Proposed Development

12.4.1 Construction Phase

The Proposed Development will entail the construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing operations building and paramedic base building to the east of the site, and construction of a new operations and paramedic base building to the west of the site; and the demolition of an existing helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary waste water treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, the upgrade of an existing entrance onto the L-5215-0 road, site landscaping and all other associated site development works.

12.4.2 Operational Phase

The operational phase will entail the continued operation of the property as an aerodrome site and will not require ground excavations works that will have the potential to adversely impact any potential unrecorded sub-surface archaeological remains that may exist within the

Proposed Development site. The operational phase will result in the use of the aerodrome by Rathcoole Flying Club increase by c.1,940 flight movements per annum while the use by the air ambulance service is projected to remain broadly in line with current trends. The operation phase will see two paramedics, two pilots and an engineer on site, while there will be a security person present at night-time.

12.5 Potential Impact of the Proposed Development

12.5.1 Construction Phase

There are no recorded archaeological sites located within the footprint of the proposed ground excavation works within the boundary of the Proposed Development. The north end of the ringfort (CO030-145----) adjacent to the southern boundary of the Proposed Development is located c.25m to the east of the nearest area of proposed construction phase ground excavation works within the site. The location of that Proposed Development area was subject to archaeological test trenching in 2023 and nothing of archaeological significance was identified (Section 12.3.5). The Proposed Development will include planting of a secondary hedgerow within the inside of the existing roadside hedgerow along the south boundary of the Proposed Development. This new hedgerow has been designed to avoid the location of the ringfort and will not result in any impacts on the archaeological site. In addition, the levelled ringfort retains no visible surface remains which have the potential to be susceptible to indirect adverse impacts on their setting during the construction phase.

There are no other recorded archaeological sites located within the boundary of the Proposed Development. A road bridge known as Colhurst Bridge is located outside the northeast boundary of the Proposed Development and is in current use as a road transport crossing over the river. This bridge is listed as an archaeological site (CO030-247----) and is also included in the NIAH (Ref. 20903013). No interventions to this structure will occur during the construction phase. There are no other recorded archaeological sites located within 500m of the Proposed Development.

The construction phase of the Proposed Development will, therefore, not result in any predicted direct or indirect effects on the known archaeological resource.

While nothing of archaeological significance was identified during archaeological test trenching investigations within the Proposed Development site, the potential for the presence of unrecorded, sub-surface archaeological remains cannot be entirely discounted. As the existence, nature, depth and extent of any unrecorded, sub-surface archaeological remains within the Proposed Development site are unknown; the magnitude and significance of effects by ground works during the construction phase is indeterminable but the potential for direct, adverse effects is noted and this will require mitigation.

The Proposed Development site is bound to the north by a section of the River Blackwater. There are no construction works proposed within the river channel or along its bank and, therefore, no adverse impacts on any potential unrecorded underwater archaeological remains are predicted.

There are no Protected Structures or structures/gardens listed in the NIAH located within the Proposed Development site and it is not situated within, or in the environs of, an Architectural Conservation Area. In addition, the Proposed Development site does not contain any

undesigned built structures of cultural heritage significance such as vernacular structures. The construction phase will, therefore, not result in any potential impacts on the architectural heritage resource.

The construction phase will entail the removal of a section of a field boundary which forms part of the townland boundary between Rathcool and Knockcahill. This will give rise to a direct, permanent, adverse effect on a localised section of a historic land division that is of local (low) cultural heritage value, and this will result in a slight significance of effect.

12.5.2 Operational Phase

As detailed in Section 12.4, the operational phase will result in an increase in Rathcool Flying Club flight movements within the aerodrome. The archaeological and architectural heritage constraints within the study area (Ringfort CO030-145----, Colhurst Bridge (CO030-247----/NIAH 20903013) and Ardnagreine House (NIAH 20903012)) do not comprise amenity or tourism attractions that retain notable setting sensitivities, and the increase in flight movements is, therefore, not predicted to result in any adverse effects on these cultural heritage constraints. Following the successful implementation of the archaeological mitigation measures detailed in Section 12.6, no operational phase adverse effects on the cultural heritage resource are predicted.

12.5.3 Potential Cumulative Impacts

A search was conducted of planning applications within the environs of the Proposed Development, using the Cork County Council (CCC) and An Bord Pleanála (ABP) online planning portals. The search was limited to a 5-year period preceding the date of the compilation of this assessment and excluded retention applications where a development has already occurred, incomplete, withdrawn, and refused applications. The review revealed that relevant planning applications in proximity to the Proposed Development comprise a GAA sports facility (CCC Ref: 236233), an extension to a dwelling (CCC Ref: 235624), single dwelling houses (CCC Refs: 245380 and 196001), a residential development (CCC Ref. 216188 and ABP Ref. 314526-22) and a small agricultural development (CCC Ref: 204802). A review of the locations of these developments revealed that none contain any recorded cultural heritage constraints, such as recorded archaeological sites or designated architectural heritage structures, within or adjacent to their boundaries. The Proposed Development is, therefore, predicted not to result in any cumulative effects on the cultural heritage resource in combination with the above developments.

12.5.4 “Do Nothing” Impact

A ‘Do Nothing Scenario’ will see to the continued preservation of the known and potential cultural heritage resource within the study area, including any potential sub-surface archaeological remains that may be located within the Proposed Development site.

12.6 Avoidance, Remedial & Mitigation Measures

12.6.1 Construction Phase

Archaeological monitoring of ground excavation works during the construction phase will be carried out by a suitably qualified archaeologist under licence by the National Monument Service. In the event that any archaeological sites or features are identified during monitoring, ground works will halt at that location while they are recorded and then left to remain securely *in situ* within a cordoned off area. The National Monuments Service and the Cork County Council Archaeologist will be notified of the discovery and consulted to determine further appropriate mitigation measures, which may entail preservation *in situ* by avoidance or preservation by record through a licensed archaeological excavation. The appointed archaeologist will also compile an advance written and photographic record of the section of the townland boundary between Rathcool and Knockcahill located within the footprint of the proposed construction works. All ground works within the environs of the townland boundary will also be subject to archaeological monitoring.

The appointed archaeologist will also supervise the establishment of an archaeological exclusion area delimited by secure fencing around the extent of the levelled ringfort (CO030-145----) within the Proposed Development site. Per consultations with the Cork County Council Archaeologist during the compilation of this assessment, the archaeological exclusion area will be set at a distance of 15m from the outer edge of the ringfort enclosure, as visible on aerial/satellite imagery (Figures 12-5 and 12-8). This fencing will remain in place for the duration of the construction phase and the archaeological exclusion area will be clearly signed as a 'no entry area'. No ground reduction works or other ancillary development works including, but not limited to, drainage/services, spoil storage, traffic/parking, compounds, or landscaping/planting, will occur within the archaeological exclusion area.



Figure 12-8 Extent of Archaeological Exclusion Area

There are no Protected Structures or structures/lands listed in the NIAH located within the Proposed Development site and it is not situated within, or in the environs of, an Architectural Conservation Area. In addition, the Proposed Development site does not contain any undesignated structures of cultural heritage significance such as vernacular structures. No mitigation measures for the architectural heritage resource are, therefore, required. The construction phase of the Proposed Development will not result in any predicted effects on other aspects of the architectural cultural heritage resource that will require mitigation.

12.6.2 Operational Phase

The levelled ringfort (CO030-145---) located within the boundary of the Proposed Development does not retain any surviving above ground traces and, therefore, no screening, monitoring or maintenance of extant remains of the archaeological site will be required during the operation phase of the Proposed Development.

The location of the ringfort and its surrounding 15m exclusion area will be excluded from any potential future development proposals within the boundary of the Proposed Development.

The location of the ringfort and the surrounding 15m area will be clearly identified (and mapped) as an archaeological exclusion area on relevant site management plan documents,

including, but not limited to plans in relation to vegetation maintenance, landscaping, contractor inductions, health/safety and emergency procedures.

The location of the exclusion area will be clearly marked by a permanent sign located outside its outer edge which will identify the location as an archaeological exclusion area.

No landscaping, tree-planting, tree root removal, drainage, traffic, storage or other works which will have the potential to result in ground disturbance that may directly impact any sub-surface archaeological deposits, features or objects will occur within the archaeological exclusion zone during the operational phase.

The maintenance of the archaeological exclusion area will be limited to periodic grass-cutting and strimming of roadside trees as required (above ground only), and this will only occur during dry weather conditions in order to minimise any potential disturbance of the existing ground surface within the area.

Given the nature of the proposed aerodrome development no livestock or tillage farming, which have the potential to result in ground disturbance by trampling or ploughing, will occur within the archaeological exclusion area during the operation phase.

A suitably qualified archaeologist will be retained to advise on the design of any future potential development proposals, if any, that may be located within the environs of the archaeological exclusion zone and will prepare an archaeological impact assessment of any such potential development. This will include a process of consultation with the Cork County Council Archaeologist and the National Monuments Service.

12.6.3 “Worst Case” Scenario

If the Proposed Development were to proceed without the implementation of the archaeological mitigation measures outlined in Section 12.6.1, then construction phase ground works will have the potential to result in direct adverse effects on any unrecorded, sub-surface archaeological remains that may exist within the Proposed Development site.

12.7 Residual Impacts

The mitigation measures detailed in Section 12.6 will provide for either the preservation *in situ* of any currently unrecorded, sub-surface archaeological features that may exist within the footprint of the Proposed Development by avoidance or the proper and adequate recording of such features by full archaeological excavation. Preservation *in situ* shall allow for a negligible magnitude of effect resulting in a potential not significant/imperceptible significance of effect in the context of residual impacts on the unrecorded archaeological resource. Preservation by record shall allow for a high magnitude of effect, albeit ameliorated by the creation of a full and detailed archaeological record, the results of which shall be publicly disseminated. This shall result in a potential slight/moderate range of significance of effect in the context of residual adverse impacts on the unrecorded archaeological resource. No other residual effects are predicted following the application of mitigation measures.

12.8 Monitoring

12.8.1 Construction Phase

There are a number of obligatory processes required as part of archaeological licence applications to the National Monuments Service and these will allow for monitoring of the successful implementation of the construction phase mitigation measures presented in Section 12.6.1. A method statement detailing the proposed strategy for archaeological supervision of ground works during the construction phase will be submitted to the National Monuments Service as part of the licence application. This will clearly outline the proposed extent of ground works and outline the consultation process to be enacted in the event that any unrecorded archaeological remains are identified, which may include preservation in situ by avoidance or preservation in record by archaeological excavation. A report will be compiled on all archaeological site investigations which will clearly present the results in written, drawn and photographic formats. Copies of this report will be submitted to the National Monuments Service, Cork County Council and the National Museum of Ireland.

12.8.2 Operational Phase

As detailed in Section 12.6.2, a suitably qualified archaeologist will be retained to advise on the design of any potential future developments (if any) within the aerodrome property which are located within the environs of the archaeological exclusion area around Ringfort CO030-145----. The appointed archaeologist will prepare an archaeological impact assessment of any such potential development which will be carried out in consultation with the Cork County Council Archaeologist and the National Monuments Service.

12.9 Interactions

The Proposed Development will not interact with other aspects of the environment assessed in this EIAR to result in predicted effects on the cultural heritage resource.

12.10 Difficulties Encountered When Compiling

No difficulties were encountered during the compilation of this assessment.

12.11 References

Consulted publications

Cork County Council (2022) *Cork County Development Plan 2022-2028*.

Department of Arts, Heritage, Gaeltacht and the Islands (1999) *Framework and Principles for the Protection of the Archaeological Heritage*. Government of Ireland.

Department of Arts, Heritage, and the Gaeltacht (2011) *Architectural Heritage Protection: Guidelines for Planning Authorities*. Government of Ireland. Government of Ireland.

Environmental Protection Agency (2022) *Guidelines for Information to be Contained in Environmental Impact Assessment Reports*.

International Council on Monuments and Sites (2011) *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*.

Lewis, S. (1837) *Topographical Dictionary of Ireland*. Lewis & Company, London.

National Monuments Service (2006) *Guidelines for Authors of Reports on Archaeological Excavations*. Government of Ireland.

Power, D., *et al* (2000) *Archaeological Inventory of County Cork (Volume 4: North Cork)*. Stationery Office, Dublin.

Consulted online sources

www.archaeology.ie (SMR and NIAH)

www.duchas.ie (Folklore)

<http://www.millstreet.ie> (Local history)

<https://nationalinventoryich.chg.gov.ie/national-inventory/> (Intangible assets)

www.excavations.ie (Archaeological investigations)

www.logainm.ie (Placenames)

www.heritagemaps.ie/WebApps/HeritageMaps/index.html (Various datasets)

13 MATERIAL ASSETS: TRAFFIC

13.1 Introduction

This material assets (Traffic & Transport) chapter assesses and evaluates the likely impact the Proposed Development will have on the existing roads network in the vicinity of the site, as well as identifying proposed mitigation measures to minimise such impacts.

13.1.1 Quality Assurance and Competency of Experts

This chapter was prepared by James Daly BEng CEng MIEI of MHL Consulting Engineers. James has been involved in the preparation of Traffic & Transportation Schemes for over 15 years and is fully competent in the use of traffic modelling software used as part of this assessment, namely Junctions 9: PICADY.

13.2 Study Methodology

The scope of this study has been reviewed and discussed with Cork County Council's area engineer. Key parameters relating to the traffic modelling carried out including, junctions to be assessed, trip generation, trip distribution, assessment years, and the presentation of results were reviewed prior to the commencement of the study.

The Traffic & Transport Assessment (TTA) includes the following tasks:

- Review of the existing infrastructure and traffic conditions.
- Estimation of the trips generated from the Proposed Development in the AM and PM peak hours and the distribution onto the local road network.
- Estimation of the traffic growth rates and calculation of predicted future traffic-volumes.
- Assessment of impacted junctions surrounding the Proposed Development and
- Proposed mitigation measures (if required) to help offset any impact the development may have.

The aim of this TTA is to identify the characteristics of the application site and surrounding area, examine the likely transport implications, ensure sustainable accessibility is maximised and appropriate infrastructure provided to accommodate the Proposed Development.

The key issues that need to be addressed within this TTA, with reference to the size and location of the development proposal, are as follows:

- Review of the site location, composition, and local roads network.
- Analysis of Road Safety data.
- A review of the relevant planning and transport policy.
- Description of the development proposal.
- Forecast trip generation as agreed with the Local Authority.
- The use of appropriate and agreed traffic modelling software for the assessment of individual junctions.
- Provide With/Without Development assessment for each of the critical junctions.

- Assess significance of development generated traffic upon the surrounding transport infrastructure and identify any necessary mitigation.

The TTA concludes that the Proposed Development, in traffic and transportation terms is acceptable, and there are no traffic and transportation reasons that should prevent the Planning Authority from recommending approval of this application.

13.3 The Existing and Receiving Environment (Baseline Situation)

13.3.1 Land Use

The existing site is located at Rathcoole Aerodrome, Knockcahill & Rathcool, Mallow, Co. Cork. This aerodrome is under the license of the Aeronautical Services Department of the Irish Aviation Authority. There is currently a single grass-strip runway on the grounds.

The nature of the surrounding area is greenfield. The lands are bound to the north by the River Blackwater, to the south by the L5215, to the east by the L1117 Local Road and to the west by greenfields.

13.3.2 Existing Roads Network

The L1117 Local Road runs north-south from the R583 (just south of the N72) to Rathcool Town. The N72 runs east-west from Mallow to Killarney.

The site is accessed via an entrance off the L5215.



Figure 13-1: Existing *Site Entrance*

Discussions with the Local Authority resulted in the identification of the following junction as critical and to be included in this traffic analysis.

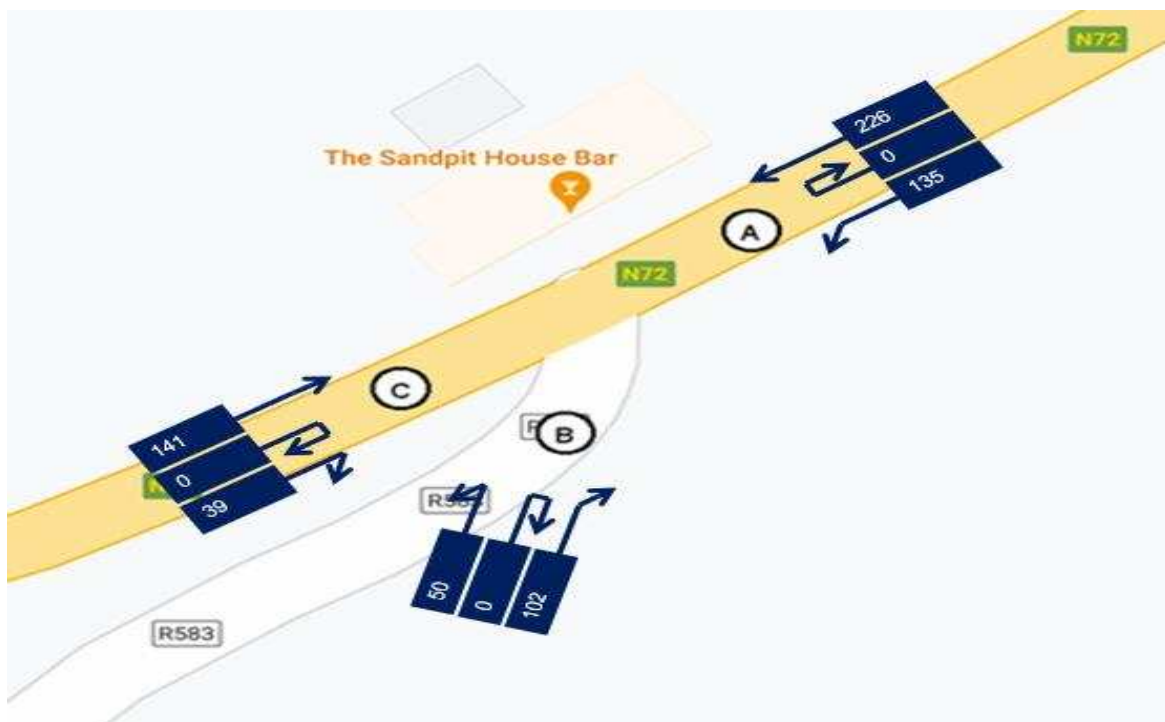


Figure 13-2: Junction 1: T-junction between the N72 & R583.

The N72 is a national primary road which connects Mallow in Co. Cork to Killarney Co. Kerry. The R583 provides a vehicular access for Millstreet and Rathcool towns to the N72. The measured two-way AADT (Annual Average Daily Traffic) at the T-junction is 5,188 vehicles.



Figure 13-3: Image of N72/R583 T-junction



- 12-hour classified turning counts (1 site, refer Fig 13-1).
- Background OS Mapping and aerial photography.
- On-site junction measurements including saturation flows, link speeds, and geometric data for each of the modelled junctions.

Turning count surveys were undertaken at the identified junctions as part of the study on August 2nd, 2023. On-site measurements including lane widths, junction turning radii, lane lengths and saturation flows were undertaken by MHL.

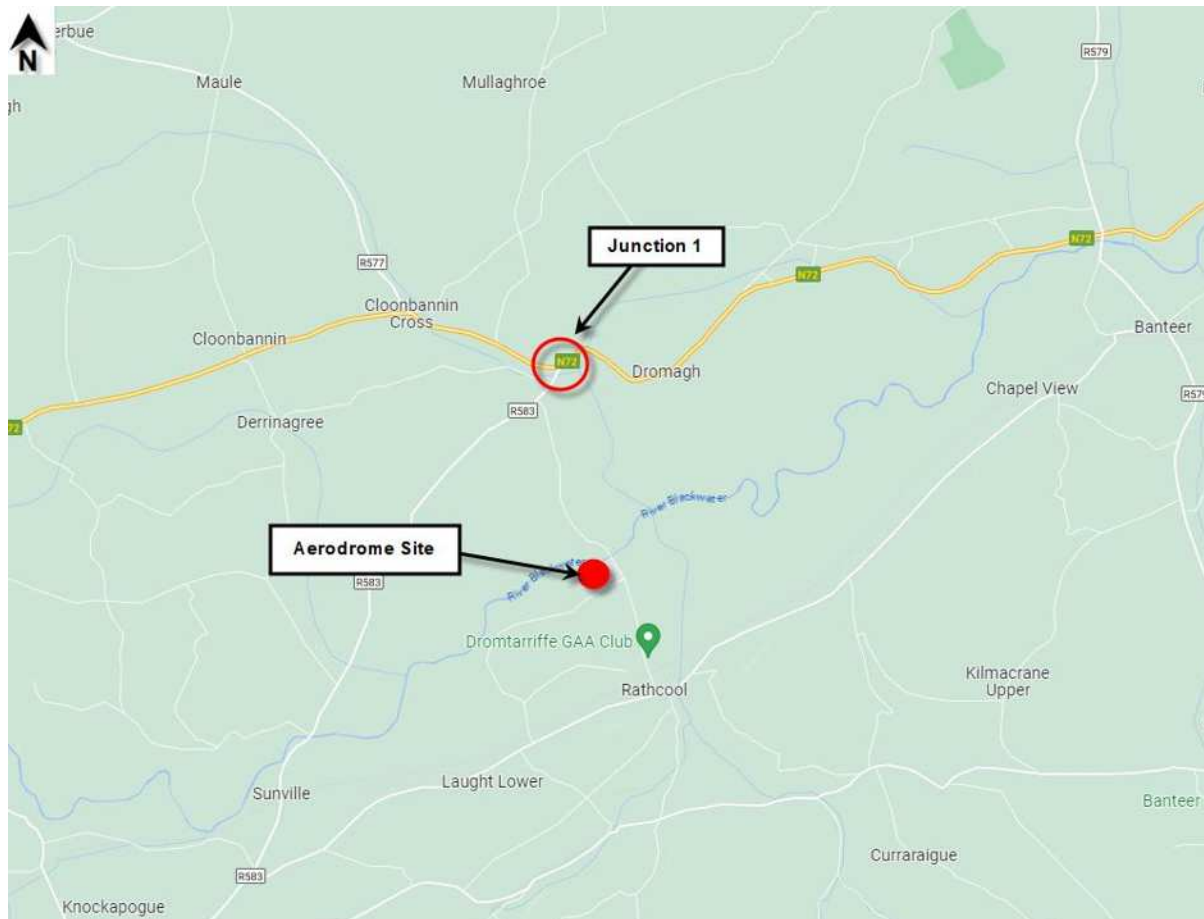
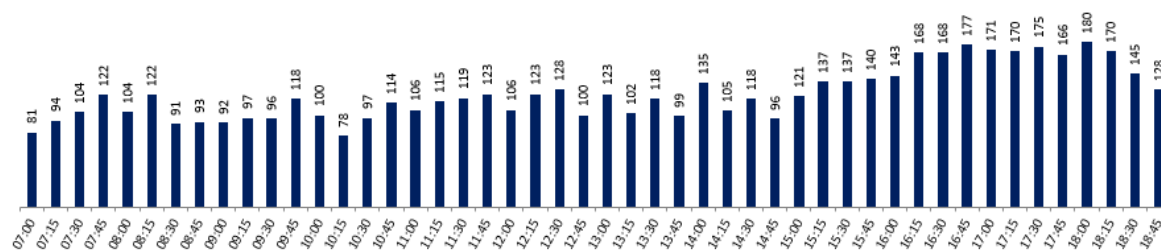


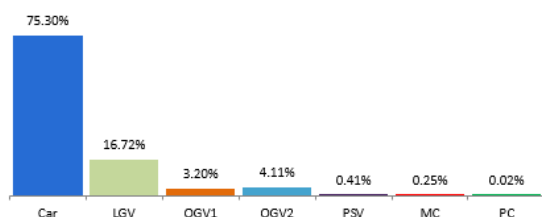
Figure 13-6 Traffic Count Survey Locations – Junction site

The following figure presents the recorded 12-hour traffic profile, percentage of classified vehicles and turning movements for the modelled junction carried out August 2nd, 2023:

Total Number of Vehicles per Interval



Percentage of Classified Vehicles



	A	B	C
A	2	1115	1574
B	997	1	380
C	1507	339	0

Figure 13-7 Percentage of classified vehicles and turning movements

The data presented in the above figure shows the respective morning and evening peak hour traffic periods for the junction to be 07:30 to 08:30 and 16:45 to 17:45. For the purposes of modelling the junction in the network, the respective peak volumes were used. This ensures the worst-case traffic conditions are modelled.

The percentage of classified vehicles was used within the generated traffic models to reflect existing conditions more accurately.

13.3.4 RSA Collision Data

RSA collision data was not available for the area surrounding the development due to GDPR constraints.

13.4 Characteristics of the Proposed Development

13.4.1 Construction Phase

Please refer to Chapter 1 of this EIAR for final development description.

This application involves the construction of a hard surfaced runway (740m in length) and taxiway (147.6m in length) with associated ground level lighting, associated interceptors, along with the demolition of an existing hangar to the east of the site and construction of a replacement hangar of approximately the same size and design to the west of the site; the demolition of the existing operations building and paramedic base building to the east of the site, and construction of a new operations and paramedic base building to the west of the site; and the demolition of an existing helipad to the east of the site, and construction of a new helipad to the west of the site, all associated with the HSE Air Ambulance. The development is to be served by a new proprietary waste water treatment system and includes the closure of an existing vehicular entrance onto the L-5215-0 road and its relocation further west along the same road, the upgrade of an existing entrance onto the L-5215-0 road, site landscaping and all other associated site development works..

The site is to operate between the hours of 7am and 9pm with 5 employees (2 pilots, 1 engineer, and 2 paramedics) present during daytime hours and 1 no. security person present at night.

On average there are 2 callouts per day, wherein the helicopter is primarily used and the flying club experiences approximately 15 flights per week. The paramedics are also called out twice daily on average, in which case their small ambulance is used.

Figures 13-8 and 13-9 present the existing and proposed scheme layout, the subject of this application. Figure 13-10 showing the further details of the Proposed Hardstanding parking, EV parking and Bicycle parking proposed on the site.

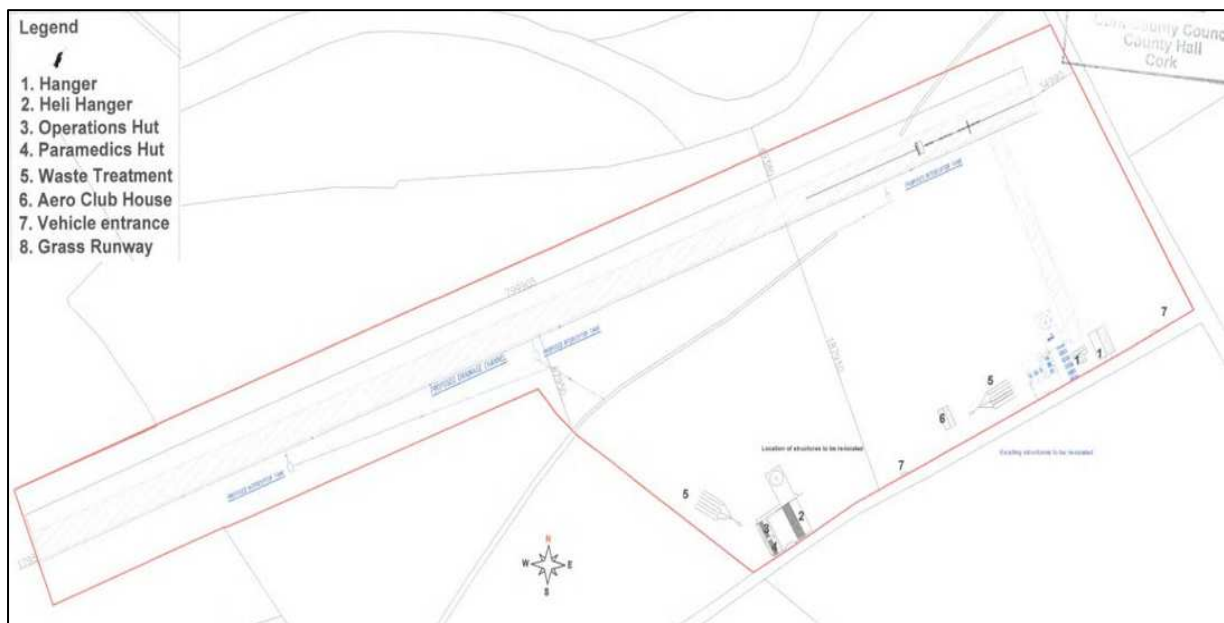


Figure 13-8 Existing Site Layout

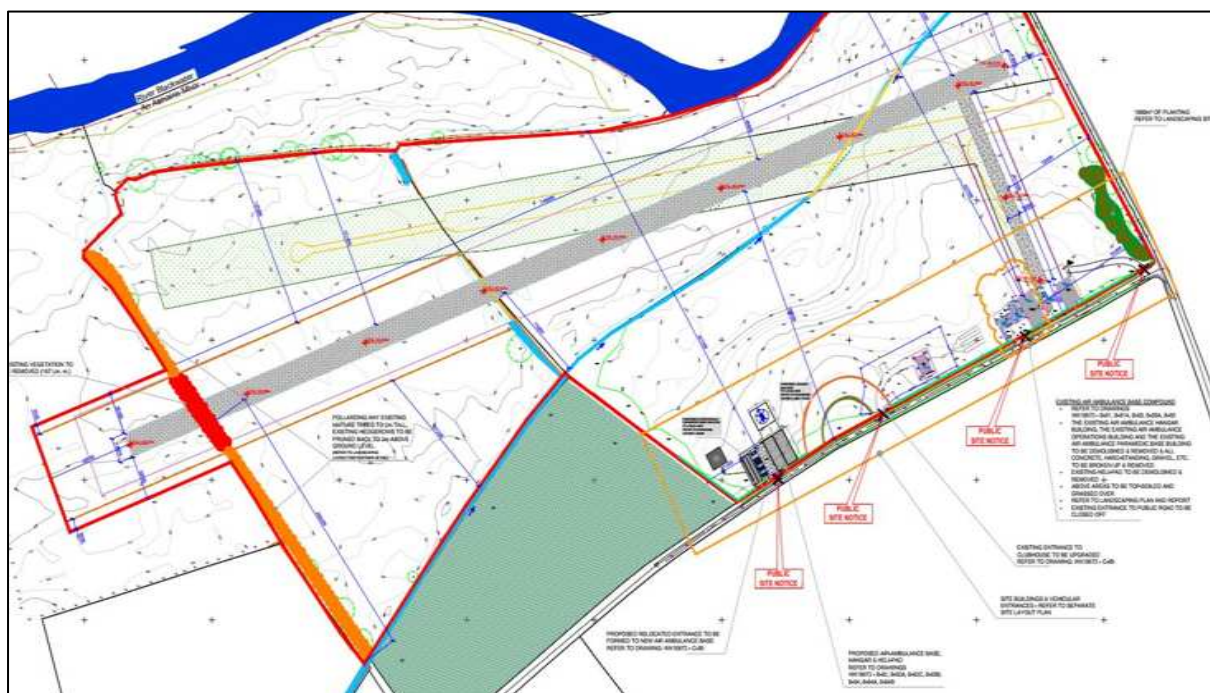


Figure 13-9 Proposed Site Layout

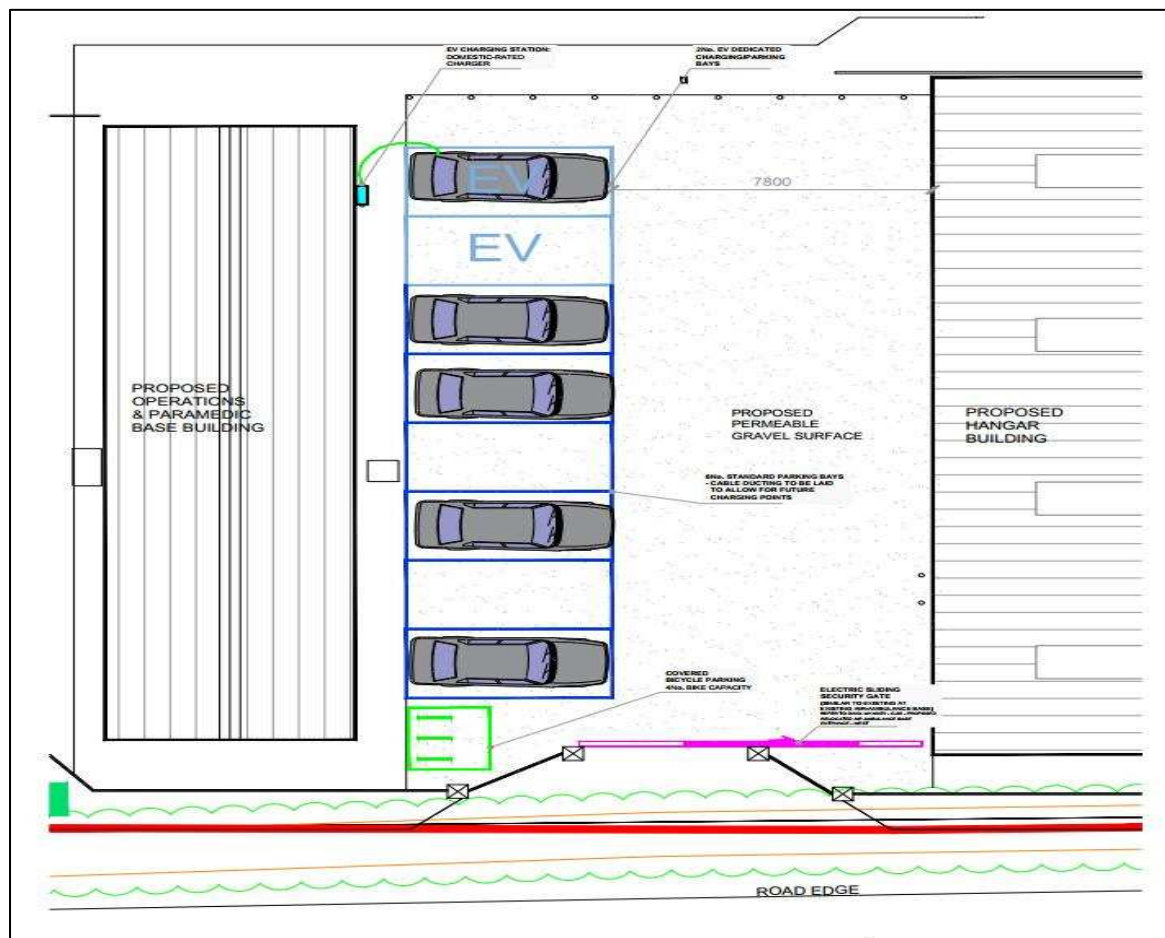


Figure 13-10 Proposed Car Parking including EV Spaces

13.4.2 Operational Phase

The proposed scheme is intended to be completed in a single phase and will cause minimum disruption.

13.5 Potential Impact of the Proposed Development

13.5.1 Construction Phase

The Proposed Development will have minimum impact on the surrounding roads network during construction. The road and existing sightlines re to be kept clear at all times. Contractor parking will be on site which will ensure that no unnecessary congestion or potential traffic hazards on the local roads.

13.5.2 Operational Phase

In order to assess the impact of the Proposed Development on the identified study area, the key junction has been assessed both with/without development traffic for both AM and PM peak hours. As the development will be delivered in a singular phase, results are presented

for the current year 2024, Design Year (2025) when the full development is in operation, 5 years after the full operation start 2030, and 15 years after the full operation start 2040.

The traffic data recorded shows the respective morning and evening peak hour traffic periods for the N72/R583 junction to be 07:30 to 08:30 and 16:45 to 17:45. This priority T-junction was taken to be the only junction modelled as it is expected that all development traffic will travel towards the N72.

13.5.3 Potential Cumulative Impacts

Industry standard growth rates have been applied to background traffic for future year assessments (to account for further development within the area). These growth rates make allowance for modal shift targets as set by national policy but do not take account of site-specific measures that may be implemented to mitigate against traffic generation from a particular development.

13.5.4 “Do Nothing” Impact

The local roads network has been assessed for the Do-Nothing Scenario and is presented as the ‘without dev’ results for the modelled junctions. The results tables generated by the Junctions 9 PICADY traffic modelling package have been constructed to make it easy to make a direct comparison between the with/without scenarios for each of the years and peak periods, refer to Section 13.5.9 Network Modelling Results.

13.5.5 Traffic Forecasting

The TII Guidelines have been followed when forecasting growth rates for background traffic for the area. Recorded background traffic was factored using TII (Transport Infrastructure Ireland) Project Appraisal Guidelines (PE-PAG-02017) for use in future year scenarios. The following table presents the factors used on recorded PCU's based on Link Based Growth Rates (Central Growth) for County Cork.

			Cars/LGV	HGV	Combined
Count %			95%	5%	100%
2024	to	2025	1.010	1.024	1.011
2024	to	2030	1.063	1.151	1.067
2024	to	2040	1.075	1.342	1.088
NRA Project Appraisal Guidelines- 5.5 forecasting					
Appendix 3 - Guidance on traffic modelling					

Figure 13-11 Background Traffic Growth Rates Per Annum

13.5.6 Traffic Generation

This section describes the traffic generation from the development and is based on the number of employees based at the site each day. There are 5 no. employees based at the development every day. Staff are to stay at the site until a call out. Call outs are primarily dealt with by helicopter, so this does not affect vehicular traffic to and from the site. The paramedics are called out twice daily via small ambulance. An additional employee occupies the site at night for security purposes.

While it is projected that the Proposed Development will increase the number of members to up to 60 people by 2029, it is unlikely that there will be an appreciable increase in the maximum number of cars accessing the site, as there are no current proposals to increase the number of planes owned by the club. The site is not open to the general public and so no additional traffic flows are expected to and from the development from the general public.

	2025	AM PEAK		PM PEAK	
		Arrivals	Departures	Arrivals	Departures
Rathcool Aerodrome					
Total Trips Generated by Air Ambulance	7	2	3	7	
	9		10		
Total Trips Generated by Flying Club	9	2	2	9	
	11		9		
Total Trips Generated	16	4	5	16	
	20		21		

Figure 13-12 Traffic Generation from Existing site

	2029	AM PEAK		PM PEAK	
		Arrivals	Departures	Arrivals	Departures
Rathcool Aerodrome					
Total Trips Generated by Air Ambulance	7	2	3	7	
	9		10		
Total Trips Generated by Flying Club	13	2	2	13	
	13		13		
Total Trips Generated	20	4	5	20	
	24		25		

Figure 13-13 Traffic Generation from Proposed Expansion Works

13.5.7 Modal Shift

This section describes the current level of modal shift (the use of sustainable modes of travel) based on available data and compares these to national targets.

The 2016 Census online SAP data was used to assess current modal shift patterns in the Rathcool area. 72% of people in this area said they were commuting by car as either a driver or passenger. 20% of those living in the area said they commute by foot, on bicycle or by public transport.

Means of Travel	Population aged 5 years and over by means of travel to work (Number)	Population aged 5 years and over by means of travel to school or college (Number)	Population aged 5 years and over by means of travel to work, school or college (total) (Number)
On Foot	2	22	24
Bicycle	2	0	2
Bus, minibus or coach	1	17	18
Train, DART or LUAS	0	1	1
Motorcycle or scooter	1	0	1
Car Driver	90	11	101
Car passenger	7	50	57
Van	11	0	11
Other (incl. lorry)	4	0	4
Work mainly at or from home	11	0	11
Not stated	9	9	18
Total	138	110	248

Figure 13-14 2016 Modal Shift by means of travel to work, school, or college. (Small Area Population Rathcool)

The Rathcool Modal Shift is significantly lower than the national target of 20%. For the purposes of this model, no future increase in modal shift has been applied to the background traffic. This should ensure a conservative analysis of the junctions is carried out.

As part of the overlay layout for the site, as shown in Figure 13-10 above, it is proposed to install EV Charging infrastructure within the Car Park. It is also proposed to install secure bicycle parking spaces within the site boundary. These pieces of infrastructure will enable both visitors and employees to shift away from the use of fossil fuel based vehicles to more sustainable forms of transport. Refer to the drawings as submitted within the application for further details.

13.5.8 Trip Distribution

Traffic flow matrices have been developed for the identified junctions. The junctions denominated 1, 2, 3 & 4 have been assessed for the following scenarios:

- 2024 AM/PM Without Dev
- 2025 AM/PM With/Without Dev
- 2030 AM/PM With/Without Dev (full operation +5 years)
- 2040 AM/PM With/Without Dev (full operation +15 years)

Junction 1 - N72/R583													
2024 (Base Year)	O/D	AM PEAK (07:30 - 08:30)					O/D	PM PEAK (16:45 - 17:45)					
		A	B	C	TOT			A	B	C	TOT		
		A	-	70	74			144	A	-	135	226	361
		B	93	-	21			114	B	102	-	50	152
		C	158	36	-			194	C	141	39	-	180
TOT	251	106	95	452	TOT	243	174	276	693				
1.011													
2025 (Opening Year) Without Development	O/D	AM PEAK (07:30 - 08:30)					O/D	PM PEAK (16:45 - 17:45)					
		A	B	C	TOT			A	B	C	TOT		
		A	-	71	75			146	A	-	136	228	365
		B	94	-	21			115	B	103	-	51	154
		C	160	36	-			196	C	143	39	-	182
TOT	254	107	96	457	TOT	246	176	279	701				
2030 (Opening Year+5) Without Development	O/D	AM PEAK (07:30 - 08:30)					O/D	PM PEAK (16:45 - 17:45)					
		A	B	C	TOT			A	B	C	TOT		
		A	-	75	79			154	A	-	144	241	385
		B	99	-	22			122	B	109	-	53	162
		C	169	38	-			207	C	150	42	-	192
TOT	268	113	101	482	TOT	259	186	295	740				
2040 (Opening Year+15) Without Development	O/D	AM PEAK (07:30 - 08:30)					O/D	PM PEAK (16:45 - 17:45)					
		A	B	C	TOT			A	B	C	TOT		
		A	-	76	81			157	A	-	147	246	393
		B	101	-	23			124	B	111	-	54	165
		C	172	39	-			211	C	153	42	-	196
TOT	273	115	103	492	TOT	264	189	300	754				

Figure 13-15 Traffic flow matrices for Junction 1 without development traffic

Junction 1 - N72/R583											
2024 (Base Year)	AM PEAK (07:30 - 08:30)						PM PEAK (16:45 - 17:45)				
	O/D	A	B	C	TOT		O/D	A	B	C	TOT
	A	-	70	74	144		A	-	135	226	361
	B	93	-	21	114		B	102	-	50	152
	C	158	36	-	194		C	141	39	-	180
TOT	251	106	95	452	TOT	243	174	276	693		
1.011											
2025 (Opening Year) With Development	AM PEAK (07:30 - 08:30)						PM PEAK (16:45 - 17:45)				
	O/D	A	B	C	TOT		O/D	A	B	C	TOT
	A	-	71	75	146		A	-	136	228	365
	B	94	-	21	115		B	103	-	51	154
	C	160	36	-	196		C	143	39	-	182
TOT	254	107	96	457	TOT	246	176	279	701		
1.067											
2030 (Opening Year+5) With Phase 1	AM PEAK (07:30 - 08:30)						PM PEAK (16:45 - 17:45)				
	O/D	A	B	C	TOT		O/D	A	B	C	TOT
	A	-	77	79	156		A	-	144	241	385
	B	99	-	22	122		B	112	-	55	166
	C	169	40	-	208		C	150	42	-	192
TOT	268	117	101	486	TOT	262	186	296	744		
1.088											
2040 (Opening Year+15) With Development	AM PEAK (07:30 - 08:30)						PM PEAK (16:45 - 17:45)				
	O/D	A	B	C	TOT		O/D	A	B	C	TOT
	A	-	79	81	159		A	-	147	246	393
	B	101	-	23	124		B	114	-	56	169
	C	172	41	-	212		C	153	42	-	196
TOT	273	119	103	496	TOT	267	189	302	758		

Figure 13-16 Traffic flow matrices for Junction 1 with development traffic

The traffic flows through the junction are shown in the following figure 13-16 below

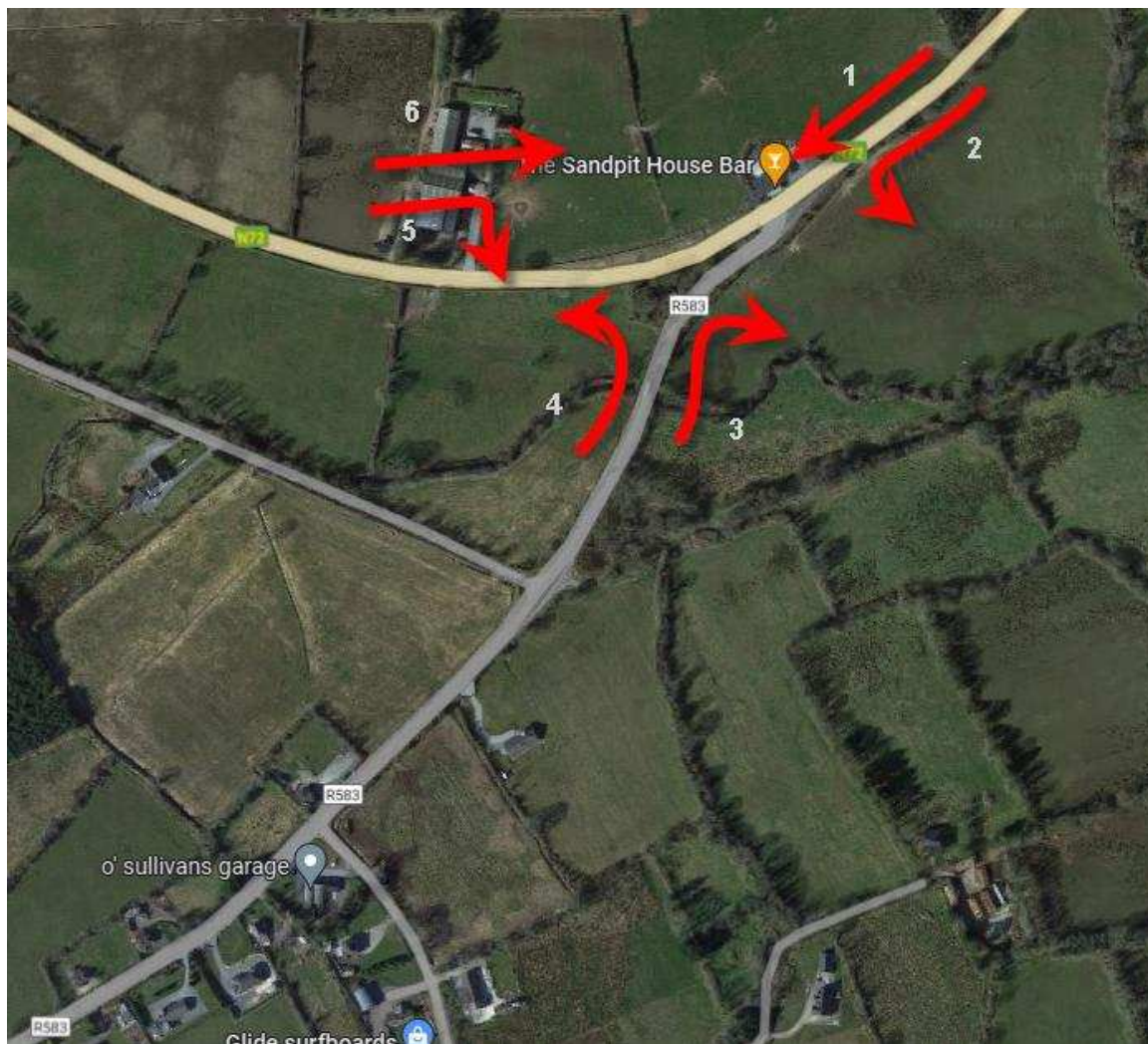


Figure 13-17 Junction 1 Movements

AM PEAK HOUR TRAFFIC FLOWS								PM PEAK HOUR TRAFFIC FLOWS							

13.5.9 Network Modelling Results

This section presents the results of the traffic modelling at each junction. Results for Junction 1 are presented both with/without development in place for the current year 2024, Design Year 2025, 5 years after the full operation start 2030, and 15 years after the full operation start 2040. The Junctions 9: PICADY software package is used to analyse each junction. PICADY (Priority Junction Capacity and Delay) is a computer software program dealing with capacities, queue lengths and delays at priority controlled 'T' junctions.

The Junctions 9: PICADY modelling software produces an RFC % (Ratio of Flow to Capacity), a Delay figure measured in seconds and a LOS (Level of Service) which are used to compare the effects the development will have on the junction being modelled. An RFC of 85% on a T-junction implies that the junction has reached capacity but is still operational with delay incurred. The following table describes the different LOS and the implications for the junction being assessed.

Table 13-1: Level of Service

Level of Service (LOS)	Description
LOS A	Free-Flow
LOS B	Reasonably Free-Flow (no delay incurred)
LOS C	Stable Operation (busy but operational with acceptable delay incurred)
LOS D	Borderline Unstable (Junctions reaching capacity – but still operational- delay incurred)
LOS E	Extremely Unstable (Junctions at capacity or over, any incident will cause a grid-lock situation- significant delay incurred)
LOS F	Breakdown (Junctions over capacity, unacceptable delay traffic at a standstill)

The PICADY results for the selected junctions are presented in following tables.

Summary Results

Show Columns

	AM						PM					
	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity	Set ID	Queue (Veh)	Delay (s)	RFC	LOS	Network Residual Capacity
N72/R583 - 2024												
Stream B-C	D1	0.0	6.87	0.04	A	123 % [Stream B-A]	D2	0.1	8.23	0.11	A	68 % [Stream B-A]
Stream B-A		0.3	11.78	0.25	B			0.4	14.32	0.31	B	
Stream C-AB		0.1	5.76	0.08	A			0.1	6.46	0.09	A	
N72/R583 - 2025 Without Development												
Stream B-C	D3	0.0	6.88	0.04	A	120 % [Stream B-A]	D5	0.1	8.27	0.11	A	67 % [Stream B-A]
Stream B-A		0.3	11.85	0.25	B			0.4	14.44	0.31	B	
Stream C-AB		0.1	5.76	0.08	A			0.1	6.46	0.09	A	
N72/R583 - 2025 With Development												
Stream B-C	D4	0.0	6.88	0.04	A	120 % [Stream B-A]	D6	0.1	8.27	0.11	A	67 % [Stream B-A]
Stream B-A		0.3	11.85	0.25	B			0.4	14.44	0.31	B	
Stream C-AB		0.1	5.76	0.08	A			0.1	6.46	0.09	A	
N72/R583 - 2030 Without Development												
Stream B-C	D7	0.0	6.94	0.04	A	109 % [Stream B-A]	D9	0.1	8.46	0.12	A	57 % [Stream B-A]
Stream B-A		0.4	12.22	0.27	B			0.5	15.23	0.34	C	
Stream C-AB		0.1	5.76	0.08	A			0.2	6.52	0.10	A	
N72/R583 - 2030 With Development												
Stream B-C	D8	0.0	6.95	0.04	A	108 % [Stream B-A]	D10	0.1	8.53	0.13	A	55 % [Stream B-A]
Stream B-A		0.4	12.26	0.27	B			0.5	15.45	0.35	C	
Stream C-AB		0.1	5.77	0.09	A			0.2	6.52	0.10	A	
N72/R583 - 2040 Without Development												
Stream B-C	D11	0.0	6.98	0.05	A	105 % [Stream B-A]	D13	0.1	8.54	0.12	A	55 % [Stream B-A]
Stream B-A		0.4	12.38	0.28	B			0.5	15.51	0.35	C	
Stream C-AB		0.1	5.76	0.09	A			0.2	6.52	0.10	A	
N72/R583 - 2040 With Development												
Stream B-C	D12	0.0	6.99	0.05	A	104 % [Stream B-A]	D14	0.1	8.61	0.13	A	53 % [Stream B-A]
Stream B-A		0.4	12.42	0.28	B			0.5	15.74	0.35	C	
Stream C-AB		0.1	5.78	0.09	A			0.2	6.52	0.10	A	

Values shown are the highest values encountered over all time segments. Delay is the maximum value of average delay per arriving vehicle. Network Residual Capacity indicates the amount by which network flow could be increased before a user-definable threshold (see Analysis Options) is met.

Figure 13-19 Junctions 9: PICADY Traffic Modelling Results – Junction 1

The current year (2024) results are representative of how the junction currently operates during peak periods. This is borne out in terms of measured queue and observed delay recorded as part of the data collection process. The constructed model is deemed to be fit for purpose.

Junction 1: T-junction between the N72 & R583.

The results indicate that the junction operates within capacity currently and will continue to do so up to and including the design year 2040 with the development in place. The maximum future year RFC (Ratio of Flow to Capacity) is 35% in 2040 PM peak. The Level of Service is C Stable Operation.

The maximum increase in RFC% as a result of the development is 1% in the PM peak. This falls below the 5% threshold stipulated by the Transport Infrastructure Ireland (TII) Traffic and Transport Assessment Guidelines 2014 and therefore, there is no requirement for a Traffic and Transport Assessment of the development to be carried out at this junction.

The full results are included in the Appendix section of this report.

13.5.10 Summary of Operational Phase Impacts

A summary of predicted operational phase impacts are presented in Figure 13-19.

Table 13-2: Development Related Impacts

Mode	Cause	Impact
Operation Stage		
Traffic	Low Level of Development Generated Traffic onto Roads Network	Slight Negative

13.5.11 Risk of Major Accidents and Disasters

The likelihood of an accident occurring involving development traffic is unlikely due to the additional traffic generated not being a significant increase on the existing volumes on the road network.

13.6 Avoidance, Remedial & Mitigation Measures

13.6.1 Construction Phase

In terms of traffic impact from the Proposed Development, the following measures are proposed prior to the completion of the development.

Mitigation Measure 1

The parking of contractor's vehicles will be set out on site, ensuring traffic does not cause any unnecessary congestion and potential traffic hazards along the public road. All trucks are to enter site and are not to park on the public road.

13.6.2 Operational Phase

No Operational Phase measures required

13.6.3 "Worst Case" Scenario

The local roads network has been assessed for the Worst-Case Scenario and is presented as the 'with dev' results for the modelled junctions. The results tables generated by the Junctions 9 Picady traffic modelling package have been constructed to make it easy to make a direct comparison between the with/without scenarios for each of the years and peak periods, refer to Section 13.5.9 Network Modelling Results.

13.7 Residual Impacts

No residual impacts anticipated from the minimum increase in traffic generation associated with the development.

13.8 Monitoring

13.8.1 Construction Phase

Refer to the CEMP for more details in relation the expected traffic associated with the Construction phase of the project. If deemed to be required, site specific TMP's will be developed by the contractor to minimise the impact of the works on the existing road network.

Deliveries will be timed and coordinated to avoid conflict with collection of waste, other deliveries (particularly adjoining landowners) and rush hour traffic (AM & PM peak hours as identified in this chapter). Large deliveries will be scheduled outside peak hours to minimise disruption.

13.8.2 Operational Phase

As stated in section 13.5.6, the number of members is expected to increase from the current 43 up to 60 people by 2029. It is expected that this increase in members will result in an increase in peak daily car trips from 9 to 13. The site is not open to the general public and so no additional traffic flows are expected to and from the development from the general public. The majority of visitors to the site are via air and use the site for refuelling etc. If the projected traffic figures change based on the developments, the traffic modelling figures can be revised to reflect any changes.

13.9 Interactions

No Interactions with other chapters of the EIAR.

13.10 Difficulties Encountered When Compiling

RSA collision data was not available for the area surrounding the development due to GDPR constraints.

13.11 References

- TII. Traffic and Transport Assessment Guidelines, PE-PDV-02045
- National Roads Authority (2014) Traffic and Transport Assessment Guidelines
- Institution of Highways & Transportation (1994) Guidelines for Traffic Impact Assessment IHT, London
- National Roads Authority (2000) Road Geometry Handbook NRA, Dublin
- National Roads Authority Design Manual for Roads and Bridges NRA, Dublin
- Design Manual for Urban Roads and Streets
- Transport for Ireland (Oct 2016) Project Appraisal Guidelines for National Roads Unit 16.1 – Expansion Factors for Short Period Traffic Counts

- Transport for Ireland 2017. Geometric Design of Junctions, DN-GEO-03060
- Transport for Ireland 2017. Rural Road Link Design, DN-GEO-03031
- National Disability Authority (NDA) guidelines – Towards Best Practice in Provision of Transport Services
- Guidelines on the information to be contained in Environmental Impact Assessment Reports (2022)
- TII approved junction simulation modelling program, Junctions 9
- Traffic Surveys: Irish Traffic Surveys Ltd
- PCU (passenger carrying units) factors, Transport in The Urban Environment, The Institution of highways and Transportation.
- Google Maps
- Openstreetmaps

13.12 Appendix – PICADY Modelling Results

14 MATERIAL ASSETS: WASTE AND UTILITIES

14.1 Introduction

This chapter provides an assessment of the potential impacts of the Proposed Development on Material Assets or physical resources in the environment of human origin including built services and infrastructure comprising:

- Electricity supply;
- Gas supply;
- Information and communications technology;
- Surface water drainage;
- Water supply and demand;
- Wastewater management; and
- Waste management

Natural resources (water, land, biodiversity, air) are addressed in their respective chapters of this EIAR.

Material assets have been defined as “Resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reason” (EPA 2002).

This definition was further expanded by the EPA in 2022 in ‘Guidelines on the information to be contained in Environmental Impact Assessment Reports’ which states:

‘The meaning of this factor is less clear than others. In Directive 2011/92/EU it included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.’

The scope and definition of material assets within the context of the EIA process has been defined by the EIA Directive as including Architectural and Archaeological Heritage or Cultural Heritage. These elements are assessed separately in Chapter 11 under Archaeology and Cultural Heritage.

14.1.1 Quality Assurance and Competence

This chapter was prepared and updated by Rachel Redmond, Environmental Consultant with Enviroguide (now DNV). Rachel has a Bachelor of Science (Hons) in Environmental Science from University College Cork. Rachel has worked as an Environmental Consultant with Enviroguide since 2023, is now a part of the DNV team and has over 3 years of experience as an environmental consultant preparing Environmental Impact Assessment Reports of a similar scale and nature to the Proposed Development.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at Enviroguide (now DNV). Catherine is an environmental consultant with 37 years’

experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

14.2 Study Methodology

The methodology adopted for the assessment takes cognisance of relevant guidelines, in particular the following:

- Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR) (2022)
- EPA (2021) Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects

The scope of work undertaken for the impact assessment included a desk-based study of built services, utilities and waste management infrastructure within the study area. The desk study involved collecting all the relevant data for the Proposed Development Site and surrounding area, including published information and details pertaining to the Proposed Development provided by the Applicant and the Design Team. Information on utilities and waste in the vicinity of the site of the Proposed Development was assembled by reviewing the following information:

- ESB Networks Utility Maps;
- Irish Water Utility Plans;
- Gas Networks Ireland Service Plans;
- EIR E-Maps;
- <http://mywaste.ie>
- EPA's Waste Application, Licence or Environmental Information Search Engine <https://epawebapp.epa.ie/terminalfour/waste/index.jsp>
- National Waste Collection Permit Office (NWCPO) – Waste Collector and Waste Facility Permit Search Engine <http://www.nwcpo.ie/permitsearch.aspx>.

All phases of the Proposed Development were considered in the assessment of potential impacts on built services, utilities and waste management infrastructure within the study area. Assessment of the likely impact of features of the Proposed Development, was carried out in accordance with the following codes of practice, guidelines, legislation, and plans:

- ESB Networks National Code of Practice for the Customer Interface Version 5 (2021);
- ESB Networks Construction Standards for MV Substation Buildings (2019);
- Irish Water Code of Practice for Water Infrastructure Connections and Developer Services Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2);
- IS EN752, Drain and Sewer Systems Outside Buildings;
- Water Services Acts 2007 to 2017;
- CIRIA Report c753 “The SuDS Manual” (2015);
- Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste) as amended by Directive (EU) 2018/851;

- European Union (Waste Directive) Regulations 2011 – 2020, S.I. No. 323 of 2020;
- Waste Management Acts 1996 to 2011; and
- The National Waste Management Plan for a Circular Economy 2024-2030.

14.2.1 Prediction and Assessment of Impacts

Impacts were predicted and assessed by using the definitions detailed in Tables 13-1 to 13-5. Impacts vary from negative to neutral or positive and vary in significance on the receiving environment.

Table 14-1 Terminology Used to Assess the Quality Potential Impacts and Effects (Source: EPA Guidance, 2022)

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment.
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment.

Table 14-2 Terminology Used to Assess the Significance of Potential Impacts and Effects

Significance of Effects / Impacts	Definition
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	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant	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 a sensitive aspect of the environment.
Profound	An effect which obliterates sensitive characteristics.

Table 14-3 Terminology Used to Assess the Duration of Potential Impacts/Effects

Duration of Effects / Impacts	Definition
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting one year or less

Duration of Effects / Impacts	Definition
Short-term	Effects lasting one to seven years
Medium-term	Effects lasting seven to fifteen years
Long-term	Effects lasting fifteen to sixty years
Permanent	Effects lasting over sixty years
Reversible	Effects that can be undone, for example through remediation or restoration

Table 14-4 Definition of the Extent and Context of Effects

Quality	Definition
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

Table 14-5 Definition of the Probability of Effects

Quality	Definition
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.

14.3 The Existing and Receiving Environment (Baseline Situation)

14.3.1 Site Location

The site is located in the townland of Rathcool, Co. Cork and sits approximately 1.5km northwest of Rathcool village. The site contains the existing aerodrome facility used by the Rathcool Flying Club and the HSE Air Ambulance service. The site contains two warehouse hangers – one is used by the Rathcool Flying Club and the other is used by the HSE Air Ambulance service. The site also contains a clubhouse which is used by the Rathcool Flying Club. It also contains a paramedic prefabricated base, crew prefabricated bases and a helipad which are used by the HSE Air Ambulance Service. Designated parking for Air Ambulance employees is provided adjacent to the paramedic prefabricated base. There is a grass runway

which is used by The Rathcool Flying Club and the Air Ambulance. The remainder of the site is made up of grassland.

A full description of the site and its location is detailed in Chapter 3 of this EIAR.

14.3.2 Immediate Surroundings

The site is subject to the Cork County Development Plan 2022-2028 (CCDP). The site is located within the North Cork Strategic Planning Area and is not zoned for a specific use.

The site is surrounded by agricultural land in all directions. The River Blackwater borders the site at the north, while there is woodland bordering the site to the south west. There are three access points to the site. The primary access point is at the southeastern corner of the site and is used by members of the Rathcool Flying Club (L1117). There is a separate access point further west which is designated for members of the Air Ambulance Service and the most southerly access point is used as an emergency exit. These access points adjoin the L-5215 road.

14.3.3 Electricity Supply

The electricity supply grid infrastructure on the island of Ireland is owned and maintained by ESB Networks and operated on a day-to-day basis by EirGrid. The grid today comprises of two types of networks, transmission lines which carry very large amounts of electricity long distances connecting power stations to local transformer stations and local distribution grids which carry electricity from the transformer stations into individual consumers' premises. The distribution system delivers electricity from the transmission system to 2.3 million customers in Ireland.

The site is currently connected via a single phase ESB connection to the site. The existing air ambulance base and the flying club building have separate oil-fired central heating systems.

14.3.4 Gas Supply

Gas Networks Ireland (GNI) builds, develops, and operates Ireland's gas infrastructure, maintaining over 14,664 km of gas pipelines and two sub-sea interconnectors. GNI is responsible for connecting all new gas customers to the network, and for work on service pipes and meters at customers' premises, on behalf of all gas suppliers in Ireland. There are no gas pipelines serving the Proposed Development.

14.3.5 Information and Communications Technology (ICT)

National Broadband Ireland was set up by the Irish Government to facilitate the roll out of fibre broadband across the Country. The Department of the Environment, Climate and Communications have developed an interactive map which details the progress of the rollout of the National Broadband Plan. The High-Speed Broadband map¹ identifies locations and premises as amber or blue and the map is updated on a quarterly basis. Amber areas depict target areas for the State intervention of the National Broadband Plan. Blue areas indicated that commercial operators have instated or are in the process of delivering high speed

¹ <https://www.gov.ie/en/publication/5634d-national-broadband-plan-map/#interactive-map>

broadband services. The site is located within an amber area which will be covered under the State Intervention of the National Broadband Plan.

In terms of mobile telecommunication for transmission and reception, there are a number of mobile masts or base stations in the local area. The closest mobile/ICT communications masts hosting Three, Imagine and Eir antennae are located approximately 2.57km to the southwest of the site.

14.3.6 On-site Surface Water Drainage

The site is currently predominantly greenfield in nature and lies within a north east trending segment of the River Blackwater valley. The lowest lying areas of the site are adjacent to a stream which runs west-southwest to east-northeast diagonally across the site. A drain exists beneath the existing grass covered runway which is culverted. Waterlogging of the low-lying areas has occurred historically following heavy persistent rainfall events and rainfall also ponds naturally on the low-lying areas (Chapter 6 Hydrology).

Any surface water will either pond, infiltrate or make its way to the drains surrounding the site and the stream running through the site.

The site drainage is critical for alleviating ponding or water logging water because of the soil permeability at the site. The drains bounding the site are capable of taking local surface water runoff without over-topping but the stream drain running through the site backs up frequently during heavy and prolonged rainfall events.

14.3.7 Water Supply and Demand

The site is not currently served by the Uisce Éireann mains network. All water used onsite is sourced from an onsite production well that was drilled in 2016. The site owner reports that the depth of the borehole is 48 feet (c. 15 m) below ground level (mbgl). The well is used for drinking water supply and will be used for drinking water supply for the proposed paramedic prefab base and crew prefab base all associated with the Irish Community Air Ambulance.

14.3.8 Local Hydrology and Hydrogeology

The site is located in the River Blackwater Catchment (HA: 18) and in sub-catchment of Blackwater (Munster) SC 040 under the Water Framework Directive (WFD).

The northern boundary of the site bounds the River Blackwater. The site is within 368 m west of the River Rathcool which is a tributary of the River Blackwater. The area of the Proposed Development is approximately 60 m south of the River Blackwater.

There is generally a relatively low density of wells and springs in the wider area. Based on the GSI website, the nearest well to the site is 4.2 km northwest of the site (1109SEW005). It is designed to abstract from subsoil and is 37.2 m deep. Along the valley containing the site, the nearest well is 6Km northeast, at Banteer. It is 42.7 m deep and abstract from the bedrock for agri-domestic purposes. Its yield is 27.2 m³/d.

The nearest public water supply (PWS) source protection zone is 20.5 km northeast of the site, the Mountnorth RWSS. After that the Oliver Cross PWS is 25 km northeast of the site. The distances group water scheme wells (GWS) are even greater (in excess of 30 km). The site is mapped as straddling the faulted contact between bedrocks of different distinguished ages, Dinantian (Early Carboniferous) Limestone (undifferentiated) underlies a stripe of the

southern margin of the site and southward dipping thrust separates the rocks of Westphalian (Late Carboniferous) age (undifferentiated; GSI, 2023) underlying the remainder of the site. The former is summarised as just Dinantian Limestone while the latter is summarised as consisting of grey shale, thin siltstone & sandstone (GSI, 2024).

14.3.9 Waste Management

The National Waste Management Plan for a Circular Economy (NWMPCE) 2024 -2030, sets out the framework for the prevention and management of waste across Ireland. This document is a statutory document underpinned by national and EU waste legislation, and reflects the targets set out for C&D waste in the Waste Framework Directive (WFD).

The strategic vision of the Plan is to rethink the approach to managing waste, and to move towards a 'circular economy' approach where resources are reused or recycled as much as possible and the overall generation of waste is minimised.

In order to achieve this vision, the Plan has set out a number of specific and measurable performance targets in relation to Construction and Demolition waste:

- Achieve a 2% reduction per annum is proposed for total construction and demolition waste to achieve a cumulative 12% reduction by 2030 (Baseline is 9 Million tonnes)
- Achieve 70% of C&D waste sent for reuse, recycling and other recovery of construction and demolition waste (excluding natural soils and stones and hazardous wastes)

The Plan aims to “prioritise waste prevention and circularity in the construction and demolition sector to reduce the resources that need to be captured as waste”.

Additionally, Cork County Development Plan 2022 - 2028 sets out a number of policies, objectives and actions for County Cork in line with the objectives of the regional waste management plan. Waste objectives and actions include:

- **BE 15-14: Waste Prevention and Management**
 - o a) Support the policy measures and actions outlined in ‘A Waste Action Plan for a Circular Economy Ireland’s National Waste Policy 2020-2025’, and Southern Region Waste Management Plan 2015 – 2021, or any successor plans;
 - o Support circular and climate resilient economy principles and associated strategic infrastructure, prioritising prevention, reuse, recycling and recovery, and to sustainably manage all types of waste by ensuring the provision of adequate waste recovery, recycling and disposal facilities for the county.
- **BE 15-15: Waste Prevention and Management of Waste Facilities**
 - o a) The expansion of existing waste facilities and the creation of new waste facilities shall comply with the criteria of the Southern Region Waste Management Plan set out above and be assessed through the development management process.
 - o b) Support the sustainable development of the Bottlehill facility for specialised and appropriate uses primarily associated with achieving the aims of the circular waste economy.
- **BE 15-16: Waste Prevention and Management:**

- o Drinking Water Treatment and/or Wastewater Treatment Ensure that sludge from drinking water treatment and/or wastewater treatment is appropriately managed, optimising potential for circular economy gains.
- **BE 15-17: Waste Prevention and Management**
 - o a) Planning applications for infilling of marginal land through soil importation will be supported where it can be demonstrated that the developments accord with proper planning and sustainable development, ensuring that they are compatible with the protection of environmental resources including water quality, Natura 2000 sites, biodiversity, archaeological and landscape resources.
 - o b) Support will be provided for locating suitable sites within the county for the safe disposal of construction and demolition waste in conjunction with the Southern Waste Region.
 - o c) Construction and Environmental Management Plans (CEMPs)/ Construction and Demolition Management Plans shall be prepared for larger scale projects as set out in paragraph 15.12.24 and this requirement shall be assessed on a case-by-case basis as part of the development management process.
 - o d) Support the implementation of the recommendations and policies of the National Hazardous Waste

Contracts are in place with appropriately authorised waste management service providers who have the appropriate skills and expertise to manage the various waste types generated. All waste contractors are appropriately permitted to collect and transport waste under the National Waste Collection Permit Office (NWCPO) and all wastes are transported to appropriately licenced or permitted waste recovery/disposal facilities.

14.4 Characteristics of the Proposed Development

The Proposed Development includes for the following:

- Construction of a hard-surfaced runway (740m in length) and taxiway
 - o This will be in the general location of the existing grass air-strip – with a c.30-degree rotation
- Runway-associated drainage measures
- Runway-associated ground level lighting,
- Relocation of the existing hanger and paramedic prefabricated base buildings
- Construction of a new helipad adjacent to the relocated base building.

See Chapter 3 for a detailed description of the Proposed Development.

14.5 Potential Impact of the Proposed Development

This section assesses the potential impact of the Proposed Development on the Material Assets of the study area.

14.5.1.1 Construction Phase

During the construction phase, all wastes generated on-site will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility. As the quantity of waste that will be generated is small in scale, it is not considered that there will be any impact on waste management in the area.

The topsoil from the site will be removed offsite to a suitably permitted or licenced facility.

Electricity and fuel will be required for the onsite machinery and plant, however it is not expected that the required fuel and electricity will be significant.

As the Rathcool Flying Club is an operational development already, drinking water, welfare facilities including showering facilities, and ICT infrastructure are already in place and currently being used. There will be a slight increase in the use of these items due to the expected 20 employees during the construction phase, however it is expected to be not significant.

The potential effects of the waste and utilities during the construction phase is expected to be not significant, slight, negative and short-term.

14.5.1.2 Operational Phase

During the operational phase, it is not expected that there will be an effect on the waste or utilities in the area. The Rathcool Flying Club is currently operational, and it is not expected that any further material assets will be required as a result of the Proposed Development, apart from the operation of the proposed wastewater treatment system.

The Rathcool Flying Club is a fully operational facility with existing ICT connections in place. The Proposed Development will not create any additional ICT demand or infrastructure development. Impacts on ICT infrastructure are therefore not anticipated as a result of the Proposed Development.

There are no additional employees expected during the operational phase, therefore there will not be an increase in municipal waste, drinking water and electricity demand.

The Proposed Development is not expected to result in a significant increase to the existing electricity supply at the site. The Request for Further Information received from Cork County Council suggests the inclusion of more sustainable forms of transport. This has been considered and it is now proposed that Electric Vehicle (EV) charging infrastructure is included at the Proposed Development with two dedicated EV parking stations included at the site. This may result in an increase in electricity use at the site.

Another addition to the site as a result of the Request for Further Information received from Cork County Council is the addition of secure bike parking. This has been considered and an eco bike shelter is now proposed for the site.

Drinking water at the site will be supplied via a drinking water well onsite which is already currently in use at the site.

The potential effect of the operational phase on the material assets is expected to be negligible, neutral and long term.

14.5.2 Potential Cumulative Impacts

Cumulative Impacts can be defined as *“impacts that result from incremental changes caused by other past, present or reasonably foreseeable actions together with the project”*. Effects which are caused by the interaction of effects, or by associated or off-site projects, are classed as indirect effects. Cumulative effects are often indirect, arising from the accumulation of different effects that are individually minor.

A review of other off-site developments was completed as part of this assessment. Chapter 2 of this EIAR details the existing and approved planning permissions on record in the area, a review of these planning permissions has been completed as part of this assessment. It is not expected that the Proposed Development will have a negative effect on the surrounding material assets in combination with an existing or permitted development, as the Rathcool Flying Club is currently operational and there are no additional employees expected during the operational phase.

14.5.3 “Do Nothing” Impact

If the Proposed Development did not go ahead, the site would remain as a grass-runway flying club. The “do nothing” scenario from a material assets perspective during the operational phase is not very different to the predicted Proposed Development effects. During the construction phase, if the Proposed Development did not go ahead, topsoil would not be removed off site.

14.6 Avoidance, Remedial and Mitigation Measures

As the use of material assets for the Proposed Development is considered to be minimal, it is not foreseen that any avoidance, remedial or mitigation measures will be required for the Proposed Development.

Specific avoidance, remedial and mitigation measures have been detailed in other chapters of this EIAR to ensure that there will be no significant impact on the surrounding environment and associated sensitive receptors.

14.6.1 “Worst Case” Scenario

The worst-case scenario would be if the waste at the Proposed Development was not disposed of correctly or unexpected hazardous waste was encountered although is deemed unlikely due to the greenfield nature of the site, or if utilities and material assets were negatively effected as a result of the Proposed Development.

14.7 Residual Impacts

Potential residual impacts from the Proposed Development were considered as part of this environmental assessment. Having regard to the mitigation measures proposed within this and other chapters of the EIAR, no significant residual impacts are anticipated. The implementation of good environmental practices will ensure that there will be no significant adverse residual impacts on Material Assets associated with the Proposed Development.

14.8 Monitoring

During the construction phase, an environmental monitoring programme will be developed and implemented by a site Contractor for the operational lifetime of the Proposed Development. The monitoring programme will verify (i) that implemented controls prevent and minimise emissions from the Proposed Development and (ii) that there is no negative impact on the receiving environment via uncontrolled releases of pollutants, sediment, dust, noise or vibration. The monitoring programme and sampling frequency will be agreed with Cork County Council.

14.9 Interactions

Material assets, utilities and waste interact with other environmental receptors as follows:

- Chapter 4 Population and Human Health: In the event of unmanaged waste from the site this could negatively impact on the surrounding human population and their overall health; and
- Chapter 7 Hydrology and Hydrogeology: The potential demand on the groundwater drinking supply has the potential to negatively effect the source of the drinking water. Chapter 7 addresses the potential effects on the groundwater drinking supply;
- Chapter 6 Lands and Soils: In the event of spillage / leaks from waste storage areas, this could negatively impact on the land and soil. Potential impacts on land and soils are addressed in Chapter 6.
- Chapter 13 Traffic: The Proposed Development will require the removal of excavated soil and transportation to appropriate waste facilities during the construction phase. This has the potential to negatively effect the surrounding road network. Potential impacts on traffic are addressed in Chapter 13 of this EIAR.

14.10 Difficulties Encountered When Compiling

No difficulties were encountered in the preparation of this chapter.

14.11 References

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

EPA (2021) Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects

EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

EPA (2013) Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites.

ESB Networks (2021) National Code of Practice for the Customer Interface Version 5.

ESB Networks (2019) Construction Standards for MV Substation Buildings.

European Union (Waste Directive) Regulations 2011-2021.

Guidance on the Setting of Trigger Values for Stormwater Discharges to Off-site Service Waters at IE and Waste Licenced Facilities.

Health and Safety Authority (2010) Code of Practice for Avoiding Danger from Underground Services.

<https://siteviewer.comreg.ie/#site/1318/53.3334867275/-6.2920326981/1/Site%201318>

<https://www.gov.ie/en/publication/5634d-national-broadband-plan-map/#interactive-map>

<http://mywaste.ie>

<https://epawebapp.epa.ie/terminalfour/waste/index.jsp>

<http://www.nwcpc.ie/permitsearch.aspx> vie

Irish Water Code of Practice for Water Infrastructure Connections and Developer Services
Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2).

The National Waste Management Plan for a Circular Economy 2024-2030.

Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the
Council of 19 November 2008 on waste) as amended by Directive (EU) 2018/851.

Waste Management Acts 1996 to 2011.

Water Services Acts 2007 to 2017.

15 RISK MANAGEMENT

15.1 Introduction

This chapter sets out the assessment of the vulnerability of the Proposed Development to risks of major accidents and/or disasters. It assesses the expected effects of the project to risk of major accidents and disasters including the methodology used for the assessment. The interactions and mitigation and monitoring measures are included in Chapters 15 and 16 respectively.

15.1.1 Quality Assurance and Competency of Experts

This chapter was prepared and updated by Rachel Redmond and Lakshmi Priya Mohan.

Rachel has a BSc (Hons) in Environmental Science from University College Cork. Rachel has over 3 years professional experience as an Environmental Consultant, preparing EIA Screening Reports and a range of chapters for EIARs of a similar scale and nature to the Proposed Development.

Lakshmi has a Master of Science in Environmental Science degree from University College Dublin, Master of Science degree in Zoology from Ethiraj College for Women, India, and Bachelor of Science in Zoology from Madras Christian College India. Lakshmi has worked as an Environmental Consultant with Enviroguide since 2023, is now a part of the DNV team and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Effects Interactions and Mitigation and Monitoring chapters of the EIARs.

This report was reviewed by Catherine Keogan, Technical Director and EIA Lead at Enviroguide (now DNV). Catherine is an environmental consultant with over 20 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology System.

15.2 Study Methodology

15.2.1 Scope and Context

The relevant legislation that applies to this chapter is the Planning and Development Regulations 2001 as amended, and in particular Schedule 6 – Information to be contained in EIAR. The following paragraph of Schedule 6, Paragraph 2(e)(i)(IV), specifically refers to "*a description of the likely significant effects on the environment of the proposed development resulting from ... the risks to human health, cultural heritage or the environment (for example due to accidents or disasters)*".

Paragraph 2(h) further expands with "*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."

Additionally, the Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the "COMAH Regulations"), which implement the Seveso III Directive (2012/18/EU), and which revoked the 2006 Major Accident Regulations also applies to this Chapter.

15.2.2 Guidelines and Reference Material

Cognisance has been taken of the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022). This document follows the requirements laid out in the Directive 2014/52/EU.

Specifically, the EPA Guidelines state that the EIAR must take 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)... 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 plants. 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 EIAR should refer to those separate assessments while avoiding duplication of their contents."

Reference has also been made to the Department of the Environment, Heritage & Local Government (DoEHLG) Publication 'Guide to Risk Assessment in Major Emergency Management 2010' and the Office of Emergency Planning, Department of Defence (DOD) Publication 'A National Risk Assessment for Ireland 2020'. A consolidated list of national hazards for Ireland identified in the DOD document are identified in Table 15-1.

Table 15-1 Consolidated List of National Hazards (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

Hazard: Civil	Hazard: Natural
• Large Crowd Event • Pandemic • Water Supply Distribution and Contamination • Food Chain Contamination • Animal Disease • Terrorist Incident	• Storm • Snow and Ice (including prolonged low temperature) • Flooding (including pluvial, fluvial and coastal)
Hazard: Transportation	Hazard: Technological

Hazard: Civil	Hazard: Natural
• Maritime Incident • Air Incident • Transport Hub (including Airports, Ports and Rail Stations)	• Structural Collapse (including Dam, Tunnel, Bridge and Building) • Nuclear Incident (Abroad) • Cyber Incident • Disruption of Energy Supply (including oil, gas, electricity and communications)

15.2.3 Risk Assessment Methodology

The risk assessment methodology has been supported by general risk assessment methods. Hazard analysis and risk assessment are accepted internationally as essential steps in the process of identifying the challenges that may have to be addressed by society, particularly in the context of emergency management. Mitigation as a risk treatment process involves reducing or eliminating the likelihood and/or the impact of an identified hazard (DoEHLG, 2010).

Table 15-2: Classification of National Likelihood Criteria (Source: A National Risk Assessment for Ireland (2020) Department of Defence)

National Likelihood Criteria		
Rating	Classification	Average Recurrence Interval
1	Extremely Unlikely	500 or more years between occurrences
2	Very Unlikely	100-500 year between occurrences
3	Unlikely	10-100 years between occurrences
4	Likely	1-10 years between occurrences
5	Very Likely	Less than 1 year between occurrences

15.3 Predicted Impacts

The EIAR chapters within this report identify that the Proposed Development has been designed in accordance with best practice and that the Proposed Development can be safely undertaken without risk to health.

In order to understand the potential consequences and predicted impacts of any major accident or disaster due to the Proposed Development and the vulnerability of the project a desk study was undertaken. The assessment reviewed:

- The vulnerability of the project to major accidents or disasters.
- The potential for the project to cause risks to human health, cultural heritage and the environment, as a result of that identified vulnerability.

A methodology has been used including the following phases:

Phase 1 Assessment:

The DOD Consolidated List of National Hazards was used to identify a preliminary list of potential major accident and disasters. Receptors covered by legislation were not included within the assessment, for example, the quarry operatives.

Phase 2 Screening:

The list was screened, and major events caused by geological faults or natural phenomena were not included given the unlikely event of one occurring. Elements already addressed as a key part of the design e.g. risks of building collapse, are not repeated.

Phase 3: Mitigation and Evaluation

In the event that mitigation measures included did not mitigate against the risk, then, the potential impacts on receptors are identified in the relevant chapter. Table 15-3 lists the major accidents and/or disasters reviewed.

Table 15-3: Major Accidents and/or Disasters Reviewed

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
<u>Civil</u>				
Large Crowd Event (An event with over 5,000 people)	N	Not considered vulnerable due to the nature of the Proposed Development, i.e., aerodrome.	N/A	N/A
Water Supply Contamination	Y	Waterborne diseases can be caused by consuming contaminated drinking water. No public health issues have been identified for the Proposed Development. The drinking supply at the Proposed Development is from a well drilled on the site.	Local water users including staff at the Rathcool Flying Club	Chapter 7 (Hydrology) of this report identifies the control measure required to avoid contamination of water supplies during operational works.
Food Chain Contamination	N	Not considered vulnerable	N/A	N/A
Animal Disease	N	Not considered vulnerable	N/A	N/A
Terrorist Incident	N	Not considered vulnerable	N/A	N/A
<u>Transportation</u>				
Maritime Incident	N	Not considered vulnerable. The closest port is Ringaskiddy which is located approximately c.a. 55km southeast of the site.	N/A	N/A
Air Incident	N	Not considered vulnerable. The closest international airport is Kerry Airport which is located approximately 38km northwest of the site. The next nearest airport is Cork Airport which is located approximately 44km southeast of the site. The Proposed Development is located outside the flight zone for Kerry Airport and Cork Airport and the air ambulance helicopter will avoid these flight zones.	N/A	Public Safety Zones for Cork and Kerry Airport are assessed in Section 15.4 of this chapter.

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Transport Hub (Includes Airports, Ports and Rail Stations)	N	The site is not considered as a transport hub.	N/A	N/A
Natural				
Cultural, Archaeological and Architectural Heritage	N	There are no recorded archaeological sites located within the footprint of the proposed ground excavation works within the boundary of the Proposed Development.	Cultural Heritage	Chapter 12 (Archaeology and Cultural Heritage) of this EIAR assesses impact of the Proposed Development on the Archaeological and Cultural Heritage and proposes mitigation measures where required.
Landslides	N	The GSI database (GSI, 2025) indicated that the site is located within an area of low susceptibility to landslides. There are no recorded landslides recorded on the GSI database (GSI, 2025) at the site or within a 2km radius of the site.	N/A	Chapter 6 (Land and Soils) of this EIAR assessed the vulnerability of the Proposed Development to landslides.
Earthquakes	N	Earthquakes are not likely to occur in the vicinity of the site at a sufficient intensity to pose a risk for the Proposed Development.	N/A	N/A
Floods/ Storm surge/tidal flooding	N	There are no recurring flood incidents within the Proposed Development site boundary according to the OPW's flood mapping. There are no areas within the site boundary mapped as "Benefiting Lands".	Proposed Development	Chapter 7 (Hydrology) of this EIAR identifies the vulnerability of the project to flooding.
Severe weather such as storms, blizzards, droughts, tornados, heatwaves	N	Not considered vulnerable. In the event of severe weather events, the national meteorological service, Met Éireann, provides advance notice of severe weather, usually several days in advance. When appropriate, colour-coded weather warnings are issued. The Office of Emergency Planning works with the government departments and other key public authorities in order to ensure the best possible use of resources and compatibility across different emergency planning requirements.	N/A	N/A

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Air Quality events	Y	Dust emissions from operational activities and vehicular emissions during the operational phase.	Residents/ workers	Chapter 8 and Chapter 9 (Air Quality and Climate) of this EIAR identifies the impact of the construction and operation of the development on ambient air quality.
Wildfires	N	Not considered vulnerable to wildfires.	N/A	N/A
Fire	N	The risk of fire may lead to loss of life. Aerodromes inherently involve the storage and handling of aviation fuel, operation of aircraft, and use of electrical and mechanical systems, all of which present potential ignition sources. While the Proposed Development is expected to fall within the category of normal hazard fire risks, as encountered in most infrastructure projects, the consequences of a fire event in an aerodrome setting could be substantial due to the potential for rapid escalation, risk to human health, and environmental damage. The nature and scale of the Proposed Development, combined with adherence to established fire safety regulations, design standards, and operational protocols, reduce the likelihood of a fire event resulting in serious environmental or human health impacts.	Residents, service users, members of the public and nearby properties.	Section 15.4.1 of this chapter details fire prevention measures.
Invasive species	N	No invasive species were recorded at the site. Therefore, the proposed works are not expected to result in the spread of invasive species.	Native species / local biodiversity	Chapter 5 (Biodiversity) identifies the vulnerability of the project to invasive species and details measures to avoid the introduction or dissemination of invasive species to and from the site of the Proposed Development.
<u>Technological</u>				
Structural Collapse (Building)	N	There is demolition and construction of a replacement hanger, existing operations building and paramedic base building, existing helipad, crew prefabricated bases are proposed.	N/A	N/A

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Structural Collapse (Dam, Bridge, Tunnel)	N	Not considered vulnerable as no dams, bridges or tunnels are proposed as part of the Proposed Development.	N/A	N/A
Flood defence failure	N	Appropriate drainage design, SuDS and attenuation design, have all been included in the design of the Proposed Development and will be installed according to appropriate regulations and guidelines.	Residents, service users, members of the public and nearby properties.	Chapter 7 (Hydrology) of this EIAR identifies the vulnerability of the project to flooding.
Nuclear incident	N	Not considered vulnerable.	N/A	N/A
Cyber incident	N	Not considered vulnerable.	N/A	N/A
Disruption of energy supply (oil, gas, electricity)	N	Not considered vulnerable. ESB Networks maintain the electricity network in Ireland. Gas Networks Ireland maintain the natural gas network in Ireland.	N/A	Chapter 14 (Material Assets) contains information on energy supply.
Utilities failure (communications)	N	Not considered vulnerable. In Ireland, the fixed-line communications market is dominated by Eir; while Eir, Three, and Vodafone own Ireland's mobile telecommunications infrastructure.	N/A	Chapter 14 (Material Assets) contains information on telecommunications.
Utilities failure (water supply)	N	Not considered vulnerable	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on water supply
Utilities failure (wastewater, sewage)	N	Not considered vulnerable	N/A	Chapter 7 (Hydrology) and Chapter 12 (Material Assets) of this EIAR contain information on wastewater and sewage removal and treatment
Utilities failure (solid waste)	N	Not considered vulnerable	N/A	Chapter 14 (Material Assets) of this EIAR contains information on solid waste removal and treatment

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Industrial accidents (defence, energy, oil and gas refinery, food industry, chemical industry, manufacturing, quarrying, mining)	N	There are no Upper Tier Seveso sites located near the Proposed Development. The closest is LP Gas filling services located approximately 23km east of the site.	N/A	N/A

15.4 Management Plans

15.4.1 Emergency Response Plan

Emergency Response Plans will be put in place in advance of activities commencing on site. Maintenance checks system will be employed once the aerodrome is operational. Due to the nature of proposed operations on-site the risk of fire is considered to be low. However, the strategy must allow for the increase in labour on site and additional machinery and vehicles to and from the facility.

15.4.2 Public Safety Zone

Public Safety Zones (PSZs) are mapped out around airport runways to protect the public on the ground from possible aircraft crashes in populated areas. PSZs are used to prevent inappropriate use of land where the risk to the public is greatest, for example, by limiting the type and allowable height of buildings and structures within the zones.

The closest airport to the site is Kerry Airport which is approximately 39km northwest and the second closest airport is Cork Airport which is approximately 44km southeast of the site. There are no PSZs directly over the site of the Proposed Development. Considering the distance between the Proposed Development and the nearest airport and associated PSZs, an aircraft strike disaster is not considered relevant to the Proposed Development.

15.4.3 Potential Major Emergency Management Sites and Seveso Sites

The site is located in the Garda Division of Cork County which includes the districts of Bandon, Bantry, Clonakilty, Fermoy, Macroom, Mallow, Midelton.

There is one Lower Tier Seveso Sites located within 30km of the site and no Upper Tier Seveso Sites. The closest Upper is Grasslands Agro Fertilizer, Carrigrohane Road, Cork City, Co. Cork (37km southeast of the site). The closest Lower is LPG Cylinder Filling Ltd, Quarters town Industrial Estate, Mallow, Co. Cork (23km east of the site).

Based on the distance of the Proposed Development from any Seveso Sites the risk of a potential major emergency is not considered relevant to this Proposed Development.

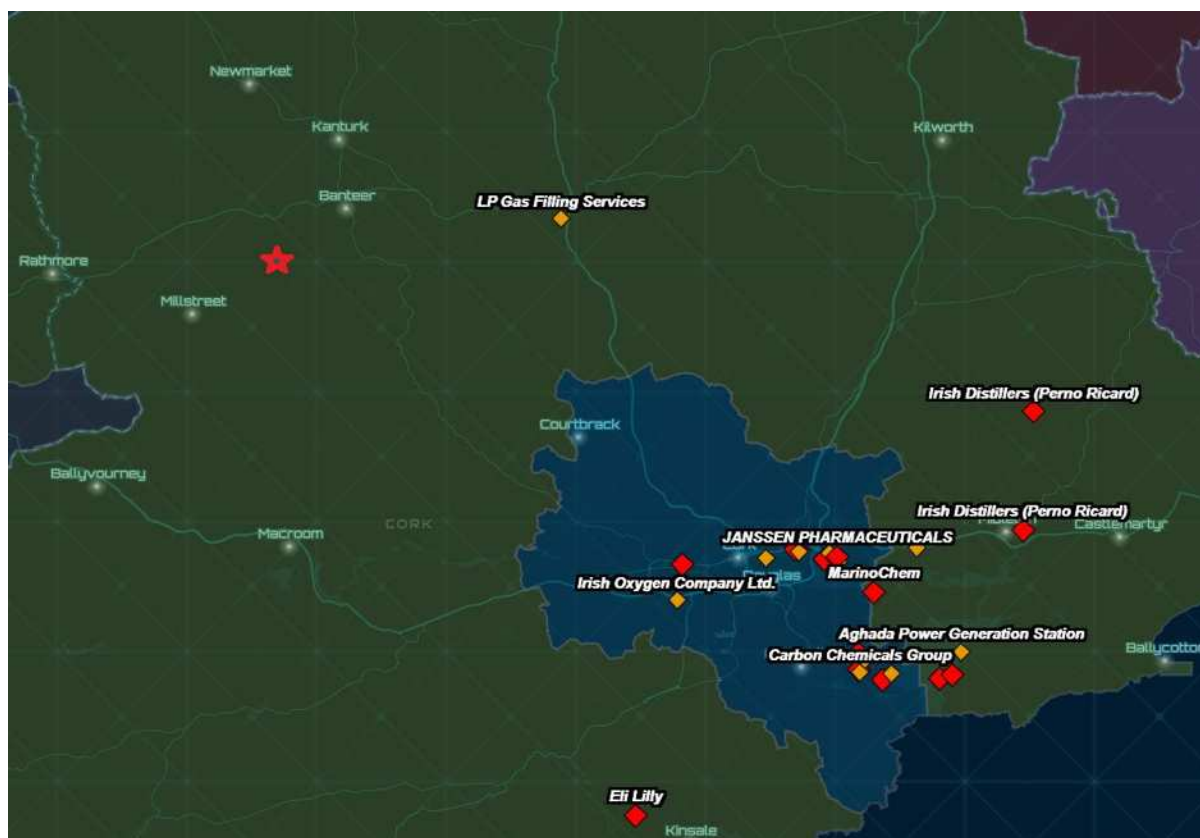


Figure 15-1 Seveso Sites located within near to the Proposed Development (Seveso Site Locations, GardaMappingSection, 2024)

15.4.4 Flood Risk

The primary potential flood risk to the Proposed Development site can be attributed to an extreme fluvial event in the River Blackwater. The site is not at risk of pluvial or groundwater flooding.

Based on the 'Planning System and Flood Risk Management Guidelines, DOEHLG, 2009' the assessment and analysis undertaken for the Site-Specific Flood Risk Assessment indicates that the area of the site where the new runway and new taxiway are proposed falls within a delineated fluvial Flood Zone 'A' and Flood Zone 'B'.

The area of the site where the new HSE Air Ambulance hanger, paramedic prefab base, crew prefab base and new proprietary wastewater treatment system are proposed falls within Flood Zone 'C'.

The Proposed Development is not expected to result in an adverse impact to the existing hydrological regime of the area or increase flood risk elsewhere (Site Specific Flood Risk Assessment, 2024).

15.4.5 Noise Management Plan

Strategies for noise management during the operational phases of Proposed Development are detailed in Chapter 10, Noise and Vibration. The potential for noise generation during the operational phase of the Proposed Development is limited to a small quantify of additional HEMS staff cars on the surrounding road network.

15.4.6 Spill Response Plan

Chapter 6, Land and Soils, and Chapter 7, Hydrology and Hydrogeology, has assessed the potential for spillages during the Proposed Development.

The potential accidental release of hazardous material including aviation fuel for helicopters, with any associated impact on the receiving land, soil and geology environment would only occur through the failure of secondary containment or a major incident on the site.

Spill kits will be made available onsite and identified with signage for use in the event of an environmental spill or leak. A spill kit will be kept in close proximity to the fuel storage area for use in the event of any incident during refuelling or maintenance works. Heavy machinery used on the site will also be equipped with its own spill kit. All works will be undertaken in accordance with conditions of granted planning.

15.5 Residual Impacts

Control measures will put in place for health and safety and environmental management as per conditions of the planning permission, relevant code of practices and relevant legislation. The residual impacts will be negligible once all control, mitigation and monitoring measures have been implemented.

15.6 Monitoring

There is no monitoring required with regards to risk management. All monitoring proposals for the interacting chapters have been detailed in the relevant technical chapters and are included in Chapter 17 Mitigation Measures and Monitoring.

15.7 Difficulties Encountered When Compiling

No difficulties were encountered in completing this chapter.

15.8 References

Chapters 4 to 14 of Volume 2 of this EIAR

Environmental Resources Management Ireland Ltd (2005) Public Safety Zones Report

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

Garda Mapping Section – Seveso Sites Ireland WebMap

<https://www.arcgis.com/home/item.html?id=a01b5a0a6ff24f10adff30beaa3b6fd0>

Irish Water Greater Dublin Area water restrictions chart

<https://www.water.ie/help/supply/water-shortages/>

Office of Emergency Planning (2020) 'A National Risk Assessment for Ireland 2020'

Department of Defence Publication

Statutory Instrument (SI). No. 296/2018 - European Union (Planning and Development)

(Environmental Impact Assessment) Regulations 2018

16 INTERACTIONS

16.1 Introduction

As a requirement of Planning Regulations and the Environmental Protection Agency's 'Guidelines on information to be contained in Environmental Impact Assessment Reports' (2022), interrelationships between various environmental aspects must be considered when assessing the impact of the Proposed Development, as well as individual significant impacts. The significant impacts of the Proposed Development and the proposed mitigation measures have been detailed in the relevant chapters of this report. However, as with all developments that pose potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts. This chapter of the EIAR addresses the interactions between the various environmental factors of the Proposed Development.

The following Section is directed by Article 3 Section 1(e) of the EIA Directive. The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022), Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015) and OPR Practice Note PN02 Environmental Impact Assessment Screening (June 2021) were also considered.

Article 3 of the Directive states:

1. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
 - a) population and human health;
 - b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
 - c) land, soil, water, air and climate;
 - d) material assets, cultural heritage and the landscape;
 - e) the interaction between the factors referred to in points (a) to (d).

16.1.1 Quality Assurance and Competence

This chapter was prepared by Lakshmi Priya Mohan, Environmental Consultant with Enviroguide Consulting (now DNV). Lakshmi has a Master of Science in Environmental Science degree from University College Dublin, Master of Science degree in Zoology from Ethiraj College for Women, India, and Bachelor of Science in Zoology from Madras Christian College India. Lakshmi has worked as an Environmental Consultant with Enviroguide since 2023, is now a part of the DNV team and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Effects Interactions and Mitigation and Monitoring chapters of the EIARs.

This chapter has been reviewed by Rachel Redmond, Environmental Consultant with Enviroguide (now DNV). Rachel has a Bachelor of Science (Hons) in Environmental Science

from University College Cork. Rachel has worked as an Environmental Consultant with Enviroguide since 2023, is now a part of the DNV team and has over 3 years of experience as an environmental consultant preparing Environmental Impact Assessment Reports.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at Enviroguide (now DNV). Catherine is an environmental consultant with over 20 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

16.2 Study Methodology

The interactions between impacts on different environmental factors have been addressed throughout this EIAR. Close co-ordination and management with the EIAR team was carried out to ensure that all likely relevant interactions were addressed at the scoping stage of the EIAR, and interactions have been adequately assessed.

Following an assessment of the EIAR, a matrix was produced to display where interactions between impacts on different factors have been addressed. This has been carried out by use of chapter headings included in the EIAR and details of any interaction during all phases of the Proposed Development.

16.3 Interactions

The following matrix has been produced to show where potential significant interactions between effects on different factors have been addressed, see Table 16-1.

As this EIAR has been prepared by a number of specialist consultants, an important aspect of the EIA process was to ensure that interactions between the various disciplines have been taken into consideration. The principal interactions requiring information exchange between the environmental specialists and the design team are summarised in Table 16-2 to Table 16-11.

Table 16-1: Interactions between Factors

Interaction	4. Population and Human Health	5. Biodiversity	6. Land and Soils	7. Hydrology and Hydrogeology	8. Air Quality and Climate	9. Climate	10. Noise and Vibration	11. Landscape and Visual	12. Archaeology and Cultural Heritage	13. Material Assets - Traffic	14. Material Assets Waste and Utilities
Population and Human Health		x	✓	✓	✓	✓	x	x	x	x	✓
Biodiversity	x		✓	✓	✓	✓	✓	✓	x	x	x
Land and Soils	x	x		✓	✓	✓	x	x	x	x	✓
Hydrology and Hydrogeology	✓	✓	✓		x	✓	x	x	x	x	✓
Air Quality	✓	x	✓	x		x	x	x	x	x	x
Climate	✓	x	✓	x	✓		x	x	x	x	x
Noise and Vibration	✓	x	x	x	x	x		x	x	x	x
Landscape and Visual Amenity	x	✓	✓	x	x	x	x		x	x	x
Archaeology, Architectural and Cultural Heritage	x	x	x	x	x	✓	x	x		x	x
Material Assets - Traffic	✓	x	✓	x	✓	x	x	x	x		✓
Material Assets – Waste and Utilities	x	x	✓	x	x	x	x	x	x	x	

	No Interaction
	Potential Interaction
	N/A

Table 16-2 Population and Human Health

Population and Human Health	
Summary	
Chapter 4 of this EIAR, <i>Population and Human Health</i>, details the direct and indirect effects of the Proposed Development on Population and Human Health; and sets out any required mitigation measures where appropriate. The Proposed Development has the potential to cause dust nuisances during the construction phase as well as noise and vibrations from plant machinery and traffic.	
Interactions	
Hydrology and Hydrogeology	Interactions with Hydrology and Hydrogeology during the operational phase has the potential to interact with Population and Human Health due to the drinking source being from an existing groundwater well. Chapter 7 Hydrology and Hydrogeology outlines the potential effects of hydrology and hydrogeology.
Air Quality and Climate	Interactions with air quality during operational phase has the potential to cause nuisances. However, the mitigation measures that will be put in place at the Proposed Development will ensure that the impacts and their effects comply with all ambient air quality legislative limits and therefore the predicted impact is not significant with a neutral effect on human health.
Noise and Vibration	The noise and vibration from the Proposed Development has the potential to cause nuisances, however given the mitigation measures proposed within Chapter 10 Noise and Vibration, it is not expected that the effects will be significant.
Material Assets: Traffic	Operational activities will result in an increased number of HGV and car movements. There is a potential impact on population and human health in relation to the capacity and operation of the surrounding road network. Chapter 13 of this EIAR has predicted traffic volumes. The overall impact of the Proposed Development on the transportation infrastructure in the local area will not be significant and subsequently there will be no significant impact on population and human health.
Conclusions	
It is unlikely that significant adverse impacts on Hydrology, Air Quality, Noise and Vibration and Traffic and Transport will occur, and mitigation measures have been set out for any of these potential interactions.	

Table 16-3: Biodiversity

Biodiversity	
Summary	
Chapter 5 of this EIAR, <i>Biodiversity</i> , details the direct and indirect effects of the Proposed Development on the local flora and fauna; and sets out any required mitigation measures where appropriate.	
Interactions	
Hydrology and Hydrogeology	The hydrology of the site when assessing the potential impacts of the Proposed Development on natural hydrological processes of the Blackwater (Munster) River. The Biodiversity Chapter has had regard to the assessment of hydrological processes enclosed within Chapter 7: Hydrology and Hydrogeology.
Landscape and Visual	Biodiversity also interacts with the landscape, particularly when considering the impacts of habitat loss and the habitat gain built into the landscaping design. The Biodiversity Chapter has had regard to Chapter 11: Landscape and Visual.
Conclusions	
Potential negative impacts have been identified for Hydrology and Hydrogeology, and Landscape and Visual. Mitigation measures have been outlined in Chapter 7 and 11 respectively.	

Table 16-4: Land and Soils

Land and Soil	
Summary	
Chapter 6 of this EIAR, <i>Land and Soils</i>, details the direct and indirect effects of the Proposed Development on the local land, soils, and geology; and sets out any required mitigation measures where appropriate. There are a number of potential pollutants associated with the construction and operational phases which have the potential to impact on the environment. The excavation and infilling of soils at the site have the potential to generate nuisance impacts such as dust, noise and sediment run-off. Consideration is given to habitats and species protected by national and international legislation or considered to be of particular conservation importance.	
Interactions	
Population and Human Health	There is a potential risk of dust generated from excavation and stockpiling of soil during the construction phase of the Proposed Development posing a human health risk in the absence of standard avoidance and mitigation measures which will be implemented to be protective of human health. Appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers.
Biodiversity	An assessment of the potential impacts of the Proposed Development on the Biodiversity of the site, with emphasis on habitats, flora and fauna which may be impacted a result of the excavation and importation of materials to the site are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.
Hydrology and Hydrogeology	An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR. In the absence of avoidance, remedial and mitigation measures, piling during the construction phase of the Proposed Development, may potentially create pathways for potential sources of contamination in shallow soils to enter underlying groundwater. Procedures for the protection of receiving water environment are set out in Chapter 7 of this EIAR.

Air Quality and Climate	The excavation of soils across the site and the temporary stockpiling of soils pending reuse or removal offsite has the potential to generate nuisance impacts (i.e., dust) during the construction phase of the Proposed Development. An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 8 and Chapter 9 of this EIAR.
Landscape and Visual	During the construction phase and into the operational phase of the Proposed Development, the site landscape will undergo a change from undeveloped lands to commercial / industrial with associated landscaping. An assessment of the potential impact of the Proposed Development on the receiving landscape is included in in Chapter 11 of this EIAR.
Material Assets: Traffic, Transport, Utilities, Infrastructure and Waste	Where possible, it is intended to retain and re-use the excavated soil and subsoil on the site for engineering fill and landscaping. However, it is anticipated that surplus material will require removal offsite. There is also a requirement to import aggregates during the construction phase of the Proposed Development. An assessment of the potential impact of the Proposed Development on the Material Assets (Traffic and Transport) and Material Assets (Utilities, Infrastructure and Waste) are included in Chapter 13 and Chapter 14 of this EIAR respectively.
Conclusions	
Potential impacts have been outlined in the respective Chapters specified above. The mitigation measures outlined in the OCEMP, and the respective Chapters outlined above, will ensure that there will be no significant adverse impacts on the receiving land, soil and geology associated with the construction phase and the operational phase of the Proposed Development.	

Table 16-5: Hydrology and Hydrogeology

Hydrology and Hydrogeology	
Summary	
Chapter 7 of this EIAR, <i>Hydrology and Hydrogeology</i> , provides an assessment of the potential impacts of the Proposed Development on hydrology, water and hydrogeology and sets out any required mitigation measures where appropriate. Consideration is given to habitats and species protected by national and international legislation or considered to be of particular conservation importance.	
Interactions	
Population and Human Health	Human health/drinking water – groundwater contamination from hydrocarbons or wastewater systems during flood events.
Biodiversity	An assessment of the potential impact of the Proposed Development Site on Biodiversity has been set out in Chapter 5 of this EIAR. Proximity to the River Blackwater SAC - changes in water quality or flow in this sensitive waterbody could affect aquatic ecosystems.
Land and Soils	An assessment of the potential impact of the Proposed Development Site on the existing land, soils and geological environment during the Operational Phase of the Proposed Development Site is set out in Chapter 6 Land and Soils. Construction activities – e.g. installation of the hard surface runway and culverts, may interact with soil erosion and sediment runoff.
Conclusions	
The protective/avoidance/mitigation measurements that will be applied as set out in the OCEMP, will ensure that the Proposed Development will not give rise to any likely significant impacts.	

Table 16-6: Air Quality

Air Quality and Climate	
Summary	
Chapter 8 of this EIAR, <i>Air Quality</i>, provides an assessment of the potential impacts of the Proposed Development on ambient air quality and climate, and sets out appropriate mitigation measures where necessary. The greatest potential effects on air quality include dust from the construction phase of the Proposed Development.	
Interactions	
Population and Human Health	The Proposed Development has the potential to generate dust during construction and emissions from traffic and aircraft during operation, which could affect nearby sensitive receptors if not properly managed. However, the mitigation measures employed at the Proposed Development, will ensure that all effects are compliant with ambient air quality standards, and that exposure levels remain below thresholds known to impact human health. Detailed dispersion modelling confirms that emissions from aircraft operations will not result in exceedances of any statutory limits, and the incremental contribution to local air quality is minor. Traffic-related pollutants have also been assessed and determined to have an overall not significant effect. Given the scale and nature of the aerodrome and its operational profile, air quality effects from the Proposed Development are not expected to have any significant adverse effect on population and human health.
Biodiversity	Interactions between air quality and biodiversity have been considered in conjunction with Chapter 5 (Biodiversity). During the construction phase, dust emissions could potentially affect nearby habitats and species. However, the mitigation measures outlined in the chapter will minimise dust deposition, and no significant impacts on designated sites or sensitive ecological receptors are anticipated. During the operational phase, emissions from aircraft and associated ground activities have also been considered. Dispersion modelling demonstrates that pollutant concentrations at ecological receptors, including the Blackwater River SAC, remain within applicable air quality standards, with the annual mean NO_x approaching but not exceeding the ecosystem protection limit under worst-case

	conditions. Given the low frequency of aircraft movements and the conservative nature of the modelling assumptions, the potential for significant impacts on biodiversity is considered to be low, and no adverse effects on designated sites are expected.
Land and Soil	Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential to generate dust, which may interact with land and soils. This interaction has been considered alongside Chapter 6 (Land and Soils). With the application of the appropriate dust control measures, no significant effects are predicted during the construction phase. There are no potentially significant interactions identified during the operational phase between air quality and land and soils.
Climate	Air quality and climate are linked because they share common emission sources, particularly from the combustion of fossil fuels during both the construction and operational phases of the Proposed Development. These activities generate pollutants that affect local air quality (e.g., NO_x, PM₁₀, PM_{2.5}) and greenhouse gases (e.g., CO₂) that contribute to global climate change. During the operational phase, emissions arise primarily from aircraft movements and associated ground vehicles. While air quality does not directly influence climate, both assessments use the same activity data to ensure consistency. The climate assessment (see Chapter 9) concludes that, following the implementation of all mitigation measures and best practice, the Proposed Development will not give rise to any significant effects on climate change during either the construction or operational phases.
Traffic	There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed not significant. Therefore, the impact of the interaction between air quality and climate is not significant.
Conclusions	
Mitigation measures employed at the Proposed Development will ensure that no significant impacts occur.	

Table 16-7: Climate

Climate	
Summary	
Chapter 9 of this EIAR, <i>Climate</i>, provides an assessment of the potential impacts of the Proposed Development on ambient climate and sets out appropriate mitigation measures where necessary. The greatest potential effects on climate include Green House Gas (GHG) from the construction phase of the Proposed Development.	
Interactions	
Population and Human Health	Human health and well-being are closely linked to climate factors, with climate change potentially exacerbating health issues such as heat stress, respiratory conditions, and vector-borne diseases. The development's impact on local climate conditions and its potential influence on public health must be carefully assessed to prevent adverse health outcomes.
Biodiversity	The relationship between climate and biodiversity is significant as well. Changes in temperature and precipitation patterns can alter habitat conditions, disrupt species distributions, and affect ecological balances. These shifts may impact local flora and fauna, necessitating careful consideration of conservation measures to protect biodiversity within and around the development area.
Land and Soil	Soil interactions with climate are critical, with changes in climate affecting soil moisture, erosion rates, and land productivity. Increased rainfall may lead to soil erosion, while extended dry periods can degrade soil quality. Addressing these interactions is essential for maintaining soil health and implementing sustainable land use practices.
Hydrology and Hydrogeology	Interactions between climate and water resources are also notable. Climate variability, such as increased rainfall or prolonged droughts, can affect water availability, quality, and management practices. This includes impacts on stormwater runoff, flood risk, and water supply. The development must incorporate effective water management

	strategies to address these potential issues and ensure resilience to changing climate conditions.
Archaeology and Cultural Heritage	Cultural heritage sites are also at risk due to climate change, with increased weathering, flooding, and temperature fluctuations potentially accelerating their deterioration. Protecting these valuable resources requires assessing the potential impacts of climate change and implementing appropriate conservation measures.
Conclusions	
Mitigation measures employed at the Proposed Development will ensure that no significant impacts occur.	

Table 16-8: Noise and Vibration

Noise and Vibration	
Summary	
Chapter 10 of this EIAR, <i>Noise and Vibration</i> , provides a description and assessment of the likely impact of the proposed activities from noise, and sets out appropriate mitigation measures where necessary.	
Interactions	
Biodiversity	When considering the Proposed Development, the noise change is insignificant compared to the site's existing noise levels. Accordingly, the likely effects on flora and fauna are not expected to significantly affect local birdlife and wildlife. Chapter 5 of the EIAR specifically addresses biodiversity. Generally, the primary receptors sensitive to noise at the site would be birds and bats, or the breeding sites of mammals such as badgers or otters. It is understood that there is no potential for significant disturbance impacts on fauna in the Biodiversity Chapter or NIS.
Conclusions	
Noise associated with the operational plant or machinery will not create any significant adverse impacts beyond the site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development.	

Table 16-9: Landscape and Visual

Landscape and Visual	
Summary	
Chapter 11 of the EIAR, <i>Landscape and Visual Assessment</i> , provides a description and assessment of the likely impact of the Proposed Development on the landscape and visual amenities of the area.	
Interactions	
Biodiversity	It is important to note that the proposed design has responded to the requirement to lower the height of the existing hedgerows (to maintain critical flight paths) by adding supplementary species throughout these affected hedgerows, more suitable to regular pruning. In this regard Landscape and Visual impacts chapter also interact with Biodiversity in Chapter 5.
Conclusions	
No significant effect interactions identified for Landscape and Visual aspects of the surrounding environment are expected from the Proposed Development.	

Table 16-10: Archaeology and Cultural Heritage

Archaeology and Cultural Heritage	
Summary	
Chapter 12 of the EIAR, <i>Archaeology and Cultural Heritage</i> , provides information on the known architectural, archaeological, and cultural heritage sites in the study area.	
Interactions	
N/A	No interactions have been identified.
Conclusions	
No interactions have been identified.	

Table 16-11: Material Assets: Traffic and Transport

Material Assets - Traffic, Waste and Utilities	
Summary	
Chapter 13 of the EIAR, <i>Material Assets: Traffic and Transport</i> , provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic.	
Interactions	
N/A	No interactions have been identified.
Conclusions	
No interactions have been identified.	

Table 16-12: Material Assets - Waste and Utilities

Material Assets - Traffic, Waste and Utilities	
Summary	
Chapter 14 of the EIAR, <i>Material Assets</i> ,: Waste and utilities provides an assessment of the potential impacts of the Proposed Development on Material Assets including built services and infrastructure.	
Interactions	
Population and Human Health	In the event of unmanaged waste from the site this could negatively impact on the surrounding human population and their overall health
Hydrology and Hydrogeology	The potential demand on the groundwater drinking supply has the potential to negatively effect the source of the drinking water. Chapter 7 addresses the potential effects on the groundwater drinking supply
Land and Soil	In the event of spillage / leaks from waste storage areas, this could negatively impact on the land and soil. Potential impacts on land and soils are addressed in Chapter 6.
Material Assets: Traffic	The Proposed Development will require the removal of excavated soil and transportation to appropriate waste facilities during the construction phase. This has the potential to negatively effect the surrounding road network. Potential impacts on traffic are addressed in Chapter 13 of this EIAR.
Conclusions	
With the implementation of all mitigation measures detailed in the respective Chapters, there will be no negative residual impacts upon the Material Assets: Waste and Utilities.	

16.4 References

Chapter 4 Population and Human Health

Chapter 5 Biodiversity

Chapter 6 Land and Soil

Chapter 7 Hydrology and Hydrogeology

Chapter 8 Air Quality

Chapter 9 Climate

Chapter 10 Noise and Vibration

Chapter 11 Landscape and Visual Impact Assessment

Chapter 12 Archaeology and Cultural Heritage

Chapter 13 Material Assets: Traffic and Transport

Chapter 14 Material Assets: Waste Management and Utilities

17 MITIGATION AND MONITORING MEASURES

17.1 Introduction

This EIAR has assessed the impacts and resulting effects likely to occur as a result of the Proposed Development on the various aspects of the receiving environment.

The Proposed Development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of particular impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects.

This chapter of the EIAR collates and summarises the mitigation commitments made in Chapter 4 to Chapter 14.

17.1.1 Quality Assurance and Competence

This chapter was prepared by Lakshmi Priya Mohan, Environmental Consultant with Enviroguide Consulting (now DNV). Lakshmi has a Master of Science in Environmental Science degree from University College Dublin, Master of Science degree in Zoology from Ethiraj College for Women, India, and Bachelor of Science in Zoology from Madras Christian College India. Lakshmi has worked as an Environmental Consultant with Enviroguide since 2023, is now a part of the DNV team and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Effects Interactions and Mitigation and Monitoring chapters of the EIARs.

This chapter has been reviewed by Rachel Redmond, Environmental Consultant with Enviroguide (now DNV). Rachel has a Bachelor of Science (Hons) in Environmental Science from University College Cork. Rachel has worked as an Environmental Consultant with Enviroguide since 2023, is now a part of the DNV team and has over 3 years of experience as an environmental consultant preparing Environmental Impact Assessment Reports.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at Enviroguide (now DNV). Catherine is an environmental consultant over 20 years' experience in consultancy, specialising in EIAs for large-scale residential, commercial developments, pharmaceutical, BESS and solar projects working closely with a range of developers, planning consultants and architects within the public and private sector. Catherine has a B.Sc. (Hons) in Analytical Science and a Post Graduate Diploma in Renewable Energy Technology Systems.

17.2 Summary of Mitigation Measures

17.2.1 Population and Human Health

17.2.1.1 Construction Phase

17.2.1.1.1 Mitigation

No specific mitigation measures are required during the construction phase of the Proposed Development in relation to population and human health, given the lack of direct, adverse effects resulting from the Proposed Development. However, mitigation measures in relation to air quality, noise, traffic, and waste are identified in their respective chapters in this EIAR.

17.2.1.1.2 Monitoring

No specific monitoring is proposed in relation to population and human health during the construction phase.

17.2.1.2 Operational Phase

17.2.1.2.1 Mitigation

No specific mitigation measures are required during the operational phase of the Proposed Development in relation to population and human health, given the lack of direct, adverse effects resulting from the Proposed Development. However, mitigation measures in relation to air quality, noise, traffic, and waste are identified in their respective chapters in this EIAR.

17.2.1.2.2 Monitoring

No specific monitoring is proposed in relation to population and human health during the operational phase.

17.2.2 Biodiversity

17.2.2.1 Construction Phase

17.2.2.1.1 Mitigation

General

The control measures for the Proposed Development will follow the following current best practice guidelines:

- H. Masters-Williams et al (2001) Control of water pollution from construction sites. Guidance for consultants and contractors (C532). CIRIA;
- Guidelines on protection of fisheries during construction works in and adjacent to waters (IFI, 2016); and
- Murnane et al (2002) Control of Water Pollution from Construction Sites- Guide to Good Practice. SP156.

The Contractor, appointed by Rathcool Flying Club, shall be required to comply with and implement the requirements and mitigation measures as set out here and incorporated in full

in the OCEMP (Waterman Kelly, 2024) and any conditions or restrictions imposed as part of the granted planning approval.

Supervision

- Rathcool Flying Club shall appoint a suitably qualified person(s), to the role of Environmental Clerk of Works (EnCoW). The role of the EnCoW will be to monitor the construction works, appoint the relevant specialists required and to ensure compliance with relevant legislation, planning conditions, to ensure the implementation of the mitigation measures in the planning approval as may be granted;
- The EnCoW shall have the authority to advise the Contractors and all site staff on the contract/project requirements, decide on elements that require direct supervision and instruct action, as appropriate, including the authority to require the temporary cessation of works, where necessary and to ensure the implementation of the mitigation measures in the planning approval as may be granted; and
- The EnCoW shall have the authority to advise the Contractors and all site staff to ensure that all personnel working on site are trained in pollution incident control response. A regular review of weather forecasts of heavy rainfall is required, and the Contractor is required to prepare a contingency plan for before and after such events.

The following mitigation measures outlined in Table 17-1 shall be implemented in full by the appointed contractor.

Table 17-1: Table of Construction Phase Mitigation Measures

Ecological Objective(s)	Feature/	Measure	Details of Mitigation
Control of Sediment Loss		Best Practice during Construction (Specific Silt Control Measures)	Any surface vegetation and spoil removed during site clearance shall be retained in an area over 10m away from any watercourse or active drainage ditch. The spoil must be surrounded by a silt fence and preferably placed on a well vegetated area. In very heavy rain, provision for covering of the stockpile with geotextile should be made. Surplus soil should be removed or re-used on site and immediately re-seeded.
Control of Sediment Loss		Best Practice during Construction (Specific Silt Control Measures)	No vegetation clearance shall take place within 10 meters of the riparian corridor with the Blackwater River. There shall be no instream works and no machinery shall be permitted to enter the Blackwater River at any point during the Proposed Development.
Control of Sediment Loss		Best Practice during Construction (Specific Silt Control Measures - Drains)	Culverting of the drainage ditches under the new runway shall be undertaken during a period of low flow. The drainage ditches shall have a series of temporary check-dams installed in advance of construction works to slow run-off velocity and prevent excessive sediment run-off from the site. These shall be a series of stake & geotextile dams backed up with gravels. A careful site drainage audit shall be carried out to identify any shallow drains / depressions and preferential flow paths from the works area towards the Blackwater River or active drainage ditches. Depressions/ preferential flow paths shall be fitted with e.g., cut-off drains/structures, geo-textile and stake and/or staked down strawbale silt traps that will intercept and slow water velocity, encourage dispersal of flows and settlement of silt prior to meeting the interface with the river or check-dams in the drainage ditch. Any sediment/silt-traps, and check dams necessary to control run-off will be regularly checked, maintained, cleaned and/or replaced, if necessary, during the construction phase.

Ecological Feature/ Objective(s)	Measure	Details of Mitigation
Avoid loss of contaminated material or leachate to the Blackwater River	Best Practice during Construction (Contaminated Materials)	Prior to undertaking any works on site, a silt fence will be erected adjacent to the bank of the Blackwater River (as illustrated in the CEMP) to intercept any silt and contamination laden runoff from excavated areas that may arise during heavy rainfall. The silt fence shall be maintained until excavation has been completed and vegetation is well established on topsoiled areas and the risk of silt laden runoff entering the river is minimised. The extent of the silt fence is shown within the OCEMP included as part of the planning application. The efficacy of the silt fence shall be monitored daily and a second silt fence erected as required to avoid or reduce mobilisation of sediment into the river.
Control of Sediment Loss	Best Practice during Construction – Sediment	There must be no discharge of suspended solids or any other deleterious matter to the drainage channels within the site or the Blackwater River during the construction phase. Any silt contaminated water from the works area must be treated prior to discharge. If dewatering is required after heavy rain from e.g., excavated areas, contaminated water must be treated prior to discharge. The Contractor shall employ best practice settling systems to ensure maximum removal of suspended solids prior to discharge of any surface water or groundwater from excavations to receiving waterbodies. This may include treatment via settlement tanks; settlement tanks shall be used in preference to settlement ponds to avoid the risk of affecting natural flow regimes. There must be no direct pumping of silt/sediment laden water from the works area to drains or an active watercourse at any time.
Avoid Hydrocarbon Loss to Water	Best Practice during Construction (Hydrocarbons)	Temporary parking and refuelling areas shall be within a designated area within and adjacent to the construction compound. As illustrated within the OCEMP accompanying the planning application, these areas are at the south of the site and are over 150m away from watercourses and drains. Best practice for hydrocarbon use and storage will be followed as set out in Section 4.2.2 of the OCEMP.
Avoid loss of concrete to water	Best Practice during Construction (Concrete)	Best practice for concrete use, disposal and wash down will be followed as set out in Section 4.2.4 of the OCEMP.
Hedgerows	Timing	No clearance of hedgerows on site shall occur during the bird breeding season from 1st March to 31st August. The removal of hedgerows, considered to be Locally Important (Higher Value) shall be kept to a minimum and loss of hedgerow shall be compensated for by a planting scheme comprising native species as described in Chapter 11: Landscape and Visual. The hedgerow planting shall link to other linear habitats (hedgerows, treelines and watercourses) to provide connectivity to the wider landscape.
Meadows	Re-establishment	The existing air ambulance base will be dismantled and the area topsoiled over. The topsoil will be seeded with native grass seed and managed with the surrounding grassland as a meadow.
Avifauna	Timing of works	No clearance of hedgerows or other removal of vegetation on site shall occur during the bird breeding season from 1st March to 31st August. The hangar supports breeding Starling and shall be dismantled outside of the bird breeding season from 1st March to 31st August.

Ecological Objective(s)	Feature/	Measure	Details of Mitigation
Bats		Best Practice Felling	No potential roosting features were recorded during the site survey. However, as a precaution and in accordance with best practice, pre-construction Potential Roost Feature (PRF) inspection/presence absence surveys of all trees scheduled for felling or pollarding shall be undertaken. Following this examination, should any of the trees be identified as a bat roost then a derogation licence application will be made to the NPWS to exclude the bats and fell the tree. Where bats are recorded roosting in the trees scheduled for felling, the following mitigation will be required: - Timing: tree-felling can be undertaken from late August to late October/early November and all works should ideally be undertaken in this period. During this period bats are still capable of flight having not entered hibernation and undertaking works in this period may reduce the risks of tree-felling if proper measures are undertaken. To carry out the works any later in the bat season creates an additional risk that bats may be in hibernation and thus unable to fly out from a tree that is being felled, although bats can be removed by hand by a licenced bat handler if required. Additionally, disturbance during winter may reduce the likelihood of survival as the bats' body temperature is too low and they may have to consume too much body fat to survive. Trees to be felled under the supervision of the bat specialist (as identified during the pre-construction survey) will be examined and where bats are found, they will be translocated to an area where bat boxes will already be installed on appropriate trees within the proposed site. The proposed process for felling the trees with PRFs is outlined below: - The bat specialist will be present during the tree felling works; - Works will be undertaken in mild weather to ensure that if bats are found during works that they can be released or safely removed; - Tree(s) identified as having potential to support bats will be surveyed during the daytime for bats prior to felling, on the day the felling is due to take place. The bat specialist will inspect all potential bat roost features of the tree, including those above ground level. This will require the services of a qualified arborist to climb the trees/ use a cherry picker and fell the tree in sections and lower potential roost features slowly to the ground to allow the bat specialist to inspect them. This will include visual inspection as well as use of an endoscope to inspect cavities/crevices; - The arborist will be briefed on the technique to be followed prior to the commencement of

Ecological Objective(s)	Feature/Measure	Details of Mitigation
		operations. Felling will follow best practice and mitigation measures, including wedging open cracks/crevices prior to load removal and cutting limbs in sections and lowering to the ground. Trees will only be felled in longer sections if the bat worker is satisfied that there are no potential roost features present; • When using a chainsaw, the rate of fall of branches will not be accelerated by the use of a chain and vehicle; • Any bats found in the trees will be removed by hand to a bat box and will then be relocated to the bat boxes installed in advance of works. Notes of any such activities will be maintained; • The tree and/or tree sections will be left on the ground for a minimum period of 24 hours to enable any unidentified bats residing in deeper crevices to make good their escape during night time hours.
Bats	Lighting	To minimise disturbance to bats and other fauna that are active at night, construction operations during the hours of darkness should be kept to a minimum. In circumstances where, during the bat activity period (April to September), daylight hours stretch beyond the likely permitted hours of operation on site, there will be no requirement for lighting to be used on the site during this period.
Badger	Pre-construction survey	No evidence of badger setts within the site was recorded during the site surveys undertaken in 2024. However, badgers create new setts regularly, therefore a pre-construction survey shall be undertaken prior to the commencement of construction to identify active badger setts occurring within the site. In the event of badger setts being identified within proximity to the proposed works area, the following mitigation measures are proposed to ensure no disturbance of the local badger population during the construction phase of the proposed works (NRA 2009): • A buffer distance of 10m from sett entrances should be employed in instances where light works such as digging by hand or in the event of scrub clearance. • A buffer distance of 20m from Badger sett entrances should be incorporated where light machinery (generally wheeled vehicles) are in operation within the site. • A buffer distance of 30m from Badger setts should be employed where heavy machinery is in operation within the site. • None of the above activities should be undertaken within 50m of active setts during the breeding season (1st December to 31st June inclusive). In the unforeseen event that the project requires works to be undertaken within the recommended buffer distances outlined above, further measures as outlined in NRA (2009) will be adopted in liaison with local NPWS staff.

Ecological Objective(s)	Feature/	Measure	Details of Mitigation
Otter		Pre-construction survey	Pre-construction otter surveys shall be undertaken prior to the commencement of any works in order to identify any changes in otter activity and holt locations since surveys for this report were completed to address possible impacts on otters. It is also important to ensure that no new holts have been created in the intervening period. This shall be conducted by a suitably qualified ecologist The removal of otters from affected holts, and the subsequent destruction of these holts, can only be conducted under a Section 25 derogation under the 1997 Habitats Regulations. Derogations are also required for any works likely to cause disturbance to active breeding holts (when present within c.150m of a scheme). Derogations are required for any works likely to cause disturbance to active breeding holts (when present within c.150m of a scheme). The removal of otters from affected holts, and the subsequent destruction of these holts, must be conducted under a Section 25 derogation under the 1997 Habitats Regulations. The National Parks and Wildlife Service (NPWS), of the Department of the Environment, Heritage and Local Government, is responsible for processing these licenses. An application for a Section 25 derogation shall be submitted to the NPWS along with the relevant ecological information from otter surveys. Closure of holts requires a monitoring period to ensure that there is no current otter activity at the holt. Derogations may not be provided by the NPWS for the closure of holts containing a breeding female or young otters. In the event of otter holts being identified within proximity to the proposed works area, the following mitigation measures shall take place to ensure no disturbance of the local otter population during the construction phase of the proposed works (NRA 2008): ▪ No works shall be undertaken within 150m of any holts at which breeding females or cubs are present. Following consultation with NPWS, works closer to such breeding holts may take place – provided appropriate mitigation measures are in place, e.g. screening and/or restricted working hours on site. ▪ No wheeled or tracked vehicles (of any kind) shall be used within 20m of active, but non-breeding, otter holts. Light work, such as digging by hand or scrub clearance shall not take place within 15m of such holts, except under licence. ▪ The prohibited working area associated with otter holts will be fenced with temporary fencing prior to any possibly invasive works. Appropriate awareness of the purpose of the enclosure shall be conveyed through notification to site staff and sufficient signage shall be placed on each exclusion fence. All contractors or operators on site shall be made fully aware of the procedures pertaining to each affected holt.

Ecological Objective(s)	Feature/	Measure	Details of Mitigation
Invasive Species		Best Practice (Invasive Plant Species)	No invasive species were identified on site during the site walkovers. However, in line with best practice, the following measures shall be undertaken: ▪ Undertake further invasive species survey prior to the commencement of construction. ▪ In the event that any such species are identified an Invasive Species Management Plan shall be prepared and implemented by the Contractor. This shall include plant specific control measures for any invasive species identified. ▪ Biosecurity measures shall be undertaken to prevent the importation of invasive species from contaminated areas into the study area. ▪ For any material entering the site, the supplier shall provide an assurance that it is free of invasive species. ▪ Machinery or plant to be inspected upon arrival and departure from site and cleaned when necessary. ▪ Ensure all site users are aware of invasive species management plan and treatment methodologies. This can be achieved through "toolbox talks" before works begin on the site. ▪ Adequate site hygiene signage shall be erected in relation to the management of non-native invasive species material.

17.2.2.1.2 Monitoring

Pollution Prevention

The aim of monitoring is to alert personnel to any increase in threat to aquatic QI species and, in particular, freshwater pearl mussel so that timely mitigation may be deployed as appropriate, and to assess the effectiveness of mitigation already in place. Monitoring shall include inspection and photographic records of potential pathways for pollutants to reach and impact on freshwater pearl mussel populations. Effective monitoring with well documented results will aid in auditing and revising emergency response plans.

A biological and chemical monitoring system will be put in place on the Blackwater River and the drainage ditch within the site. As a minimum the monitoring system will measure turbidity, suspended solids, phosphorus, BOD/ dissolved oxygen & pH on the Blackwater River upstream and downstream of the area of the site situated adjacent to the Blackwater River (Monitoring Sites A and B, figure 17-1) and within the drainage ditch upstream and downstream of the location of the new runway (Monitoring Sites C & D, figure 17-1).

The details of the monitoring system, including duration, frequency of sampling, monitoring locations, and parameters to be monitored will be agreed in advance with Inland Fisheries Ireland and the National Parks & Wildlife Service. Chemical analysis will be carried out only at laboratories that have been accredited by EPA for the analyses to be carried out.



Figure 17-1: Water quality monitoring sites

Habitat Restoration

Hedgerow planting shall be monitored for 60 months after the date of completion of all of the initial planting works. Throughout the aftercare period, all shrub planting areas will be weeded regularly. An area of 1m diameter will be kept clear around each planted tree to help ensure the early establishment. A minimum of 3-visits per growing season will be required to keep injurious weeds under control. The growth of herbaceous material between the weeded areas will be controlled by twice yearly strimming. All stakes and trees shall be maintained in firm positions within the ground and all ties securely fixed and adjusted to allow for the increase in stem girth. Plants that fail to thrive will be removed and replaced with equivalent plants as soon as possible during the following planting season.

17.2.2.2 Operational Phase

17.2.2.2.1 Mitigation

No potential for significant adverse effects has been identified during the operational phase, therefore no specific mitigation measures are required.

17.2.2.2.2 Monitoring

No monitoring requirements have been identified for the operational phase.

17.2.3 Land and Soils

17.2.3.1 Construction Phase

17.2.3.1.1 Mitigation

During the construction phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP) (Waterman Consulting Engineers, 2025) submitted with the planning application. Following appointment, the contractor will be required to further develop the OCEMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water with regard to the relevant industry standards (e.g., Guidance for Consultants and Contractors, CIRIA-C532', CIRIA, 2001). The OCEMP will be implemented for the duration of the construction phase, covering construction and waste management activities that will take place during the construction phase of the Proposed Development.

Import of Aggregates and Materials

Contract and procurement procedures will ensure that all imported aggregates and materials required for the construction phase of the Proposed Development will be sourced from reputable suppliers operating in a sustainable manner and in accordance with industry conformity/compliance standards and statutory obligations. The importation of aggregates and materials will be subject to management and control procedures which will include testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. Therefore, any unsuitable material will be identified prior to unloading / placement onsite.

Airborne Dust

Excavated soils will be carefully managed and maintained in order to minimise potential impact on soil quality and soil structure. Handling of soils will be undertaken in accordance with documented procedures that will be set out in order to protect ground and minimise airborne dust. As outlined in the OCEMP (Waterman Consulting Engineers, 2025), the measures required to prevent airborne dust emissions and associated nuisance arising from site work will be in place including measures to prevent uncovered soil drying out leading to wind pick up of dust and mud being spread onto the local road network and adjoining properties. This may require additional wetting at the point of dust release, dampening down during dry weather and wheel cleaning for any vehicles leaving the site. Potential impacts and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 8 of this EIAR.

Reuse of Soil

Subsoil materials to be reused within the Proposed Development (i.e., for landscaping on site) will be subject assessment of the suitability of for use in accordance with engineering and environmental specification for the Proposed Development.

Management and Control of Soils and Stockpiles

Segregation and storage of soils for removal off-site and waste for disposal off-site will be segregated and temporarily stored on-site pending removal or for reuse on-site.

Where possible, stockpiling of soils and subsoils onsite will be avoided. However, in the event that stockpiling is required, stockpiled materials, pending reuse on-site, will be located away from the location of any sensitive receptors (watercourses and drains). In accordance with Inland Fisheries Ireland guidelines, stockpiles will not be allowed within 30m of the open water where sufficient working areas are available within the site boundary.

The re-use of suitable cut material on-site for the Proposed Development (i.e., landscaping, raising levels or engineering fill) will be undertaken in accordance with the engineered design of the Proposed Development. Surplus or unsuitable soils will be removed offsite.

Surplus material will be segregated, and stockpiled appropriately for removal offsite. For any excavated material identified for removal offsite, while assessment and approval of acceptance at a destination re-use, recovery site or waste facility is pending, excavated soil for recovery/disposal shall be stockpiled as follows:

- A suitable temporary storage area will be identified and designated. The storage area will be fully enclosed with an appropriate silt-fencing system
- All stockpiles shall be assigned a stockpile number.
- Material identified for reuse on site, off site and waste materials will be individually segregated and all segregation, storage and stockpiling locations will be clearly delineated on the site drawings.
- Soil stockpiles will be covered to prevent run-off from the stockpiled material generation and/or the generation of dust.
- Material identified for reuse on site, off site and waste materials will be individually segregated.
- Any waste that will be temporarily stored / stockpiled will be stored on impermeable surface high-grade polythene sheeting, hardstand areas or skips to prevent cross-contamination of the soil below or cross contamination with soil.
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust.
- Stockpiles will be a minimum of 30m from drainage channels and watercourses (i.e., the Blackwater River).

Export of Resource (Soil and Subsoil) and Waste

All surplus materials and any waste will be removed off-site and managed in accordance with all legal obligations. A Construction Waste Management Plan (CWMP) should be prepared by the appointed main contractor once appointed) prior to commencement of works. It will be the contractor's responsibility to either; obtain a waste collection permit or, to engage specialist waste service contractors who will possess the requisite authorisations, for the collection and movement of waste off-site.

The re-use of soil and subsoil offsite will be undertaken in accordance with all statutory requirements and obligations including where appropriate re-use as by-product in accordance with Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended.

Any surplus material not suitable for re-use as a by-product and other waste materials arising from the construction phase will be removed offsite by an authorised contractor and sent to the appropriately authorised (licensed/permitted) receiving waste facilities. As only authorised facilities will be used, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures.

Any waste soils will be transported under a valid waste collection permit issued under the Waste Management (Collection Permit) Regulations 2007, as amended and will be delivered to an appropriately authorised waste management facility.

Waste bins, containers, skip containers and storage areas will be clearly labelled with waste types which they should contain including photographs as appropriate.

Materials and waste will be documented prior to leaving the site. All information will be entered into a waste management register kept on the site. Waste collection permits for registered hauliers and certs of registration/ licenses/permits for authorised waste facilities will be kept on file at head office.

All site personnel and sub-contractors will be instructed about the objectives of the CWMP and informed of their responsibilities as a consequence of its provisions

Vehicles transporting material with potential for dust emissions to an off-site location shall be enclosed or covered with a tarpaulin at all times to restrict the escape of dust.

Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary. The main contractor will carry out road sweeping operations, employing a suction sweeper or similar appropriate method, to remove any project related dirt and/or material deposited on the road by construction / delivery vehicles. Vehicles exiting the site shall make use of a wheel wash facility where appropriate, prior to entering onto public roads.

Concrete Works

The cementitious grout and other concrete works during the construction phase, will avoid any contamination of ground through the use of appropriate design and methods implemented by the appointed contractor and in accordance with relevant industry standards.

As documented in the OCEMP (Waterman Consulting Engineers, 2025), excess concrete which may need to be removed from foundations/formwork during construction will be contained and removed to a designated area on site where the concrete will be allowed to set in temporary forms until set. Once fully set, the concrete will be removed to an approved facility.

Wash water from cleaning ready mix concrete lorries and mixers may be contaminated with cement and is therefore highly alkaline. Due to the size of the site and the proximity of sensitive watercourses, it is recommended that lorries and mixers are washed out of offsite.

The pouring of concrete, sealing of joints, application of water proofing paint or protective systems, curing agents etc. will be completed during dry conditions.

Where required, a suitable risk assessment for wet concreting will be completed prior to works being carried out. Pumped concrete will be monitored to ensure there is no accidental discharge.

Handling of Fuels, Chemicals and Materials

Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the OCEMP (Waterman Consulting Engineers, 2025), in a designated area of the site away from any watercourses and drains (where not possible to carry out such activities offsite).

As documented in the OCEMP (Waterman Consulting Engineers, 2025), any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas. These areas will be bunded and located away (minimum of 50m) from drainage and watercourse (i.e., the Blackwater River). Bunds will have regard to current best practice for oil storage (Enterprise Ireland, BPGCS005) and Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013). All tank and drum storage areas will, as a minimum, be bunded to a volume not less than the greater of the following:

- 110% of the capacity of the largest tank or drum within the bunded area; or
- 25% of the total volume of substance that could be stored within the bunded area.

Environmentally friendly materials will be used during the construction process including the use of biodegradable lubricants and hydraulic fluids for machinery and equipment.

Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised on-site is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the site. Only emergency breakdown maintenance will be carried out on-site. Drip trays and spill kits will be available on-site to ensure that any spills from vehicles are contained and removed off-site.

There may also be the requirement for use of portable generators or similar fuel containing equipment during the construction phase of the Proposed Development, which will be placed on suitable drip trays. Regular monitoring of drip tray content will be undertaken to ensure sufficient capacity is maintained at all times

The appointed contractor will maintain an emergency response action plan and emergency procedures will be developed by the appointed contractor in advance of any works commencing. Construction staff will be familiar with the emergency response plan.

Spill kits will be made available onsite and identified with signage for use in the event of an environmental spill or leak. A spill kit will be kept in close proximity to the fuel storage area for use in the event of any incident during refuelling or maintenance works. Heavy machinery used on the site will also be equipped with its own spill kit.

Emergency Procedures

Emergency procedures will be developed by the appointed contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site. Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site.

- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants.
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained.
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the site and compliantly disposed of off-site. Residual soil will be tested to validate that all potentially contaminated material has been removed. This procedure will be undertaken in accordance with industry best practice procedures and standards.
- All construction works staff will be familiar with emergency procedures in the event of accidental fuel spillages.
- All construction works staff on-site will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving land, soil and geological environment associated with the construction phase of the Proposed Development.

Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Foul drainage from temporary welfare facilities during the construction phase of the Proposed Development will be discharged to temporary holding tank(s) the contents of which will periodically be tankered off site to a licensed facility. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations by tankering of waste offsite by an appropriately authorised contractor.

Any connection to the public foul drainage network during the construction phase of the Proposed Development will be undertaken in accordance with the necessary temporary discharge licences issued by UE.

17.2.3.1.2 Monitoring

During the construction phase the following monitoring measures will be considered:

- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with avoidance, remedial and mitigation measures.
- Inspections and monitoring will be undertaken during excavations and other groundworks to ensure that measures that are protective of water quality are fully implemented and effective.
- Materials management and waste audits will be carried out at regular intervals to monitor the following:
 - Management of soils on-site and for removal offsite.
 - Record keeping.
 - Traceability of all materials, surplus soil and other waste removed from the site; and

Ensure records are maintained of material acceptance at the end destination.

17.2.3.2 Operational Phase

17.2.3.2.1 Mitigation

There is no requirement for mitigation measures for the operational phase taking account of the design measures for the Proposed Development.

During the operational phase of the Proposed Development there is limited to no potential for any impact on the receiving land, soil and geology environment and therefore there is no mitigation required in regard to the Proposed Development.

The avoidance measures, as outlined below, which are in place as part of the baseline condition at the site, will ensure that there will be no significant impact on the receiving land, soil and geological environment.

The Proposed Development will continue to be operated in accordance with the conditions of the Aviation Licence issued annually by the Irish Aviation Authority (IAA).

The aircraft use Avgas fuel, which is similar in composition to petrol. No aircraft fuel will be stored onsite during the operational phase of the Proposed Development. The fuelling of the planes will take place offsite at either Cork Airport, Farranfore (Kerry Airport), or other airfields which have fuel stores on-site. By 2030 it is an objective to convert the Cessna aircraft to Sustainable Aviation Fuel (SAF). This fuel will be available from Cork airport by 2025 and this will provide a stopgap until fully electric aircraft are viable from the airfield.

The helicopters use Jet fuel, which is similar in composition to kerosene. There will be no fixed fuel storage tank for re-fuelling aircraft located at site of the Proposed Development and the helicopters will be refuelled by way of on point refuelling on request from the operator. Once a request for refuelling has been received the fuel will be delivered in a bunded aviation fuel bowser. Bunded tanks will adhere to ISO 9000 regulations and will be able to hold 110% of the tanks capacity to prevent overfilling, sudden tank failure, loss of tank contents and to facilitate rainfall during spillages. Further details are provided in Chapter 15 of this EIAR.

During the operational phase of the Proposed Development, the planes will be hosed down with water from the existing supply onsite or 'dry' cleaned. Chemicals will not be used in the cleaning process as this could cause the aluminium of the planes to rust.

17.2.3.2.2 Monitoring

There are no monitoring requirements specifically in relation to land, soil and geology during the operational phase of the Proposed Development.

17.2.4 Hydrology

17.2.4.1 Construction Phase

17.2.4.1.1 Mitigation

During construction, silt fencing will be installed to control surface runoff and prevent sediment from entering nearby water bodies. Contractors will adhere to Met Éireann weather warnings, particularly in the case of heavy rainfall or potential flooding, to minimize the risk of water pollution. In response to such forecasts, all equipment will be relocated outside of flood-prone areas. Additionally, comprehensive spill prevention and response plans will be implemented to manage any accidental releases effectively.

17.2.4.1.2 Monitoring

Ongoing monitoring of water quality (visual inspection to examine for oil sheen, excess suspended solids or discoloration and turbidity; plus in situ measurement to include pH, temperature, electrical conductivity, turbidity, suspended solids) in land drain and stream adjacent to construction activity will be essential to identify and mitigate any adverse impacts during this phase of works.

17.2.4.2 Operational Phase

17.2.4.2.1 Mitigation

Any runoff from the proposed runway is discharged to vegetation adjacent to the stream rather than directly into the stream because the vegetation will aid on the attenuation of any hydrocarbons spilled.

The car park between the huts and the hangar will have a concrete surface.

The helipad and runway will be constructed with a lip to collect runoff and the runoff will flow through interceptors.

Mobile bowser will be kept on a concrete surface at all times with a lip for collecting runoff when spills occur for the interceptors.

17.2.4.2.2 Monitoring

Ongoing monitoring should include a monthly visual inspection of drains to examine for oil sheen, excess suspended solids or discoloration and turbidity to ensure no hydrocarbons or excess sediment will be essential to identify and mitigate any adverse impacts during operations.

17.2.5 Air Quality and Climate

17.2.5.1 Construction Phase

17.2.5.1.1 Mitigation

Communications

- Develop and implement a stakeholder communications plan that clearly outlines how engagement will occur before work commences on site. This plan should include:
 - Establishing an online information page dedicated to the Proposed Development, which will provide:
 - Project updates and timelines;
 - Contact details for key personnel; and
 - A clear process for submitting queries or complaints.
 - Providing a complaints feedback mechanism, including:
 - A dedicated section of the website for complaints feedback and/or provision of contact details; and
 - A log of complaints and responses to ensure transparency;
- Display on the site boundary:
 - The name and contact details of person(s) accountable for air quality and dust issues (e.g., Environmental Manager/Engineer or Site Manager); and
 - Contact details for the head or regional office.
- Publicise the complaints process on both the site signage and online page to ensure members of the public know how to raise concerns.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken;
- Make the complaints log available to the local authority when asked;
- Record any exceptional incidents that cause dust and/or air emissions, either on- or off-site, and the action taken to resolve the situation in the log book; and
- Hold regular liaison meetings with other high risk construction sites within 250m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/deliveries which might be using the same strategic road network routes.

Monitoring

- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of the site boundary, with cleaning to be provided if necessary; and
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Preparing and Maintaining the site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible;
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site;
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period;
- Avoid site runoff of water or mud;
- Keep site fencing, barriers and scaffolding clean using wet methods;
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below; and
- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles;
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable; and
- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles using unpaved haul roads.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems;
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/ mitigation, using non-potable water where possible and appropriate;
- Use enclosed chutes and conveyors and covered skips;
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate; and
- Ensure equipment is readily available on site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable;
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and

- Only remove the cover in small areas during work and not all at once.

Measures Specific to Construction

- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

Measures Specific to Trackout

- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use;
- Avoid dry sweeping of large areas;
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport;
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable;
- Record all inspections of haul routes and any subsequent action in a site log book;
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowzers and regularly cleaned;
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable);
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and
- Access gates to be located at least 10 m from receptors where possible.

17.2.5.1.2 Monitoring

The monitoring of construction dust during the construction phase of the Proposed Development is recommended to ensure that impacts are not experienced beyond the site boundary. Monitoring of dust can be carried out by using the Bergerhoff Method. This involves placing Bergerhoff Dust Deposit Gauges at strategic locations along the site boundaries for a period of 30 +/- 2 days. The selection of sampling point locations should be carried out in consideration of the requirements of VDI 2119 with respect to the location of the samplers relative to buildings and other obstructions, height above ground, and sample collection and analysis procedures. After the exposure period is complete, the Gauges should be removed from the site; the dust deposits in each Gauge will then be determined gravimetrically and expressed as a dust deposition rate in mg/m²/day in accordance with the relevant standard.

17.2.5.2 Operational Phase

17.2.5.2.1 Mitigation

Due to the scale and nature of the Proposed Development, the potential for significant air quality impacts during the operational phase is considered low. Nonetheless, appropriate mitigation measures are proposed to ensure that emissions from aircraft and associated ground activities are minimised. These measures reflect best practice for low-intensity aviation operations and are designed to support the long-term environmental sustainability of the site,

in line with the objectives of the EIA Directive. The following measures will be adopted as appropriate to the scale and nature of the works:

- Minimising Engine Idling: Pilots and operators will be encouraged to minimise unnecessary engine idling during taxiing and pre-flight checks;
- Efficient Operational Practices: Adoption of efficient ground movement practices to reduce fuel use and associated emissions;
- Use of Low-Emission Aircraft: Where feasible, promotion of the use of light aircraft with lower emission profiles, including electric or hybrid models as they become more widely available; and
- Awareness and Education: Engagement with aerodrome users to raise awareness of air quality considerations and promote environmentally responsible flying practices.

17.2.5.2.2 Monitoring

Given the limited scale and nature of operations at the Proposed Development, continuous ambient air quality monitoring is not considered necessary. Instead, a complaint log will be maintained to record and respond to any air quality-related concerns raised by members of the public or local stakeholders. Should complaints indicate a potential issue, or if there is a significant change in operational activity, a reassessment of air quality impacts may be undertaken to ensure continued compliance with relevant standards.

17.2.6 Climate

17.2.6.1 Construction Phase

17.2.6.1.1 Mitigation

Climate Resilience Avoidance, Remedial & Mitigation Measures

During the construction phase specific climate resilience measures should focus on ensuring durability, water management, and energy efficiency while mitigating risks associated with extreme weather. Regarding the development's resilience to climate change, the Contractor will be required to mitigate the effects of extreme weather, such as heavy rainfall, flooding, windstorms, and temperature fluctuations, through site risk assessments and method statements.

Here are key Avoidance, Remedial & Mitigation Measures:

Foundation and Site Preparation

- **Flood Resilient Foundations:** Use raised foundations, elevated platforms, or piling where necessary in flood-prone areas.
- **Sustainable Drainage Installation:** Implement permeable surfaces, drainage channels, and attenuation tanks early in construction.
- **Soil Stabilisation:** Prevent erosion with silt fences, geotextiles, and retaining structures to withstand heavy rainfall.

Structural Reinforcement

- **Wind-Resistant Framing:** Use reinforced concrete or steel frames with proper anchoring to withstand storms.
- **Secure Roof Fixings:** Ensure hurricane straps, reinforced trusses, and mechanically fixed roof tiles to prevent wind damage.
- **Impact-Resistant Windows & Doors:** Install reinforced glass or shutters to reduce storm-related damage.

Water & Moisture Management

- **Damp-Proofing Measures:** Use high-quality damp-proof membranes (DPM) and damp-proof courses (DPC) in walls and floors.
- **Proper Drainage on Site:** Ensure temporary drainage solutions (e.g., trenches, sumps) to manage rainwater during construction.
- **Weatherproofing Structures:** Apply breathable but water-resistant membranes on external walls before cladding installation.

Material Selection & Handling

- **Use Climate-Resilient Materials:** Opt for treated timber, marine-grade plywood, concrete with low permeability, and corrosion-resistant steel.

- **Storage & Protection of Materials:** Keep materials covered and off the ground to prevent water damage or degradation.
- **Low-Carbon Concrete & Insulation:** Use alternatives like GGBS (Ground Granulated Blast-furnace Slag) concrete and eco-friendly insulation.

Energy Efficiency & Passive Design Implementation

- **High-Performance Insulation Installation:** Ensure proper fitting to avoid thermal bridging and moisture ingress.
- **Airtightness Testing During Construction:** Conduct interim blower door tests before final finishes to confirm air sealing effectiveness.
- **Green Roof Base Layers:** Install waterproofing and root barriers early if a green roof is part of the design.

On-Site Climate Adaptation Measures

- **Construction Scheduling Considerations:** Plan for extreme weather events, avoiding major excavation or external works in heavy rain seasons.
- **Cold/Hot Weather Plan:** Strategies such as planned road gritting, thermal protection, chemical accelerants, temporary enclosures, and alternative heating/cooling solutions enable builders to overcome these obstacles and achieve successful project outcomes.
- **Temporary Wind & Rain Barriers:** Use tarpaulins, scaffolding covers, and temporary roofing to protect partially built structures.
- **Emergency Power Supply:** Have generators or battery backups on site to maintain critical construction processes.

GHG (Green House Gas) Resilience Avoidance, Remedial & Mitigation Measures

Embodied carbon of materials and construction activities is the primary source of climate impacts during the construction phase. Pre-construction carbon Avoidance, Remedial & Mitigation Measures include:

Design for Performance

- Request a Design for Performance approach from design teams and contractors.
- Include contractual targets for whole life carbon with a focus on Net Zero and nature-positive goals where possible.

Circularity in Design

- Require design teams to develop a circularity concept for projects, focusing on adaptability, disassembly, and reuse.
- Set a target for a percentage of reused and recycled materials in designs.

Carbon Literacy

- Develop carbon literacy within design and construction teams by providing training on carbon literacy, ESG reporting, and disclosure.
- Incorporate sustainability and carbon considerations into site team talks, construction targets, and reporting.
- Include training clauses for contractors and sub-contractors to upskill their teams in low-energy construction techniques.

Cement Reduction

- Specify the minimum amount of cement needed in concrete and substitute where feasible to reduce cement usage.

Sustainable Procurement

- Review sustainable procurement and material choices during detailed design to identify and implement lower embodied carbon options.
- Request Environmental Product Declarations (EPDs) and prefer products with EPDs where possible within procurement restrictions.
- Drive demand for EPDs by increasing the percentage of products used in the project with EPDs.

Energy and Carbon Performance Reporting

- Plan to disclose the operational energy and carbon performance of the project in your annual reporting.

Construction Waste Management

- Create a demolition and construction programme allowing sufficient time to determine reuse and recycling opportunities for demolition waste.
- Appoint a competent demolition contractor to undertake a pre-demolition audit detailing resource recovery best practice and identifying materials for reuse and recycling.
- Reuse materials on site in the new build areas where possible.

Local Material Sourcing

- Source materials locally where possible to reduce transport-related CO2 emissions.

Rathcool Flying Club sustainability goals outlines the Aerodrome's strategies to reduce carbon emissions. The Rathcool Flying Club has set ambitious sustainability goals to enhance its environmental impact in the medium to long term. By 2030, the club aims to convert its Cessna aircraft to Sustainable Aviation Fuel (SAF), which will be available from Cork airport by 2025. This transition to SAF is expected to reduce CO2 emissions by 90%, noise by 40%, and increase the aircraft's range by 40%, thereby reducing refuelling requirements. Additionally, by 2040 to 2050, the club plans to have all its planes either using SAF or being fully electric. The adoption of electric planes, which are anticipated to become more viable and economical over the next 15 to 20 years, will further reduce noise and operating costs. The club also envisions utilising solar panels on the aircraft hangar roof to provide clean power for the site. These strategies collectively contribute to a comprehensive approach to reducing the club's carbon footprint across Scope 1, 2 and 3 of the GHG Protocol of emissions.

Scope 1: Direct emissions from sources owned or controlled by the organisation, such as fuel use in vehicles. The club's strategy to convert its Cessna aircraft to Sustainable Aviation Fuel (SAF) by 2030 directly addresses Scope 1 emissions. SAF is expected to reduce CO2 emissions by 90%, which significantly lowers the direct emissions from the club's aircraft. Additionally, the long-term goal of transitioning to fully electric planes by 2040-2050 will further reduce direct emissions, as electric planes produce no direct CO2 emissions

Scope 2: Indirect emissions from the company's energy consumption, like electricity usage. The plan to install solar panels on the aircraft hangar roof to provide clean power for the site addresses Scope 2 emissions. By generating renewable energy on-site, the club can reduce its reliance on electricity from the grid, which may be generated from fossil fuels. This shift to renewable energy sources will decrease the club's indirect emissions associated with electricity usage.

Scope 3: Emissions not directly produced by the company but indirectly tied to its value chain, including product sourcing, usage, and disposal. Scope 3 encompasses emissions not covered by Scopes 1 and 2. Direct emissions from sources owned or controlled by the organisation, such as fuel use in vehicles. The club's strategy to convert its Cessna aircraft to Sustainable Aviation Fuel (SAF) by 2030 directly addresses Scope 1 emissions. SAF is expected to reduce CO2 emissions by 90%, which significantly lowers the direct emissions from the club's aircraft.

Additionally, certified datasheets for construction materials will outline their operational temperature limits, ensuring that temperature-sensitive materials perform adequately. The Contractor will also address risks associated with fog, lightning, and hail through appropriate risk assessments and mitigation plans.

During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- **Energy-Efficient Equipment:** Use energy-efficient machinery and equipment on-site. Regular maintenance and proper operation can also help reduce fuel consumption and emissions.
- **Renewable Energy:** Incorporate renewable energy sources, such as solar panels, to power construction activities. This can significantly reduce reliance on fossil fuels
- **Reduce Idling:** Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- **Sustainability Awareness:** Ensure that sustainability and carbon specifically is incorporated into site team talks, construction and reporting targets. Integrate training clauses for contractors and sub-contractors to upskill their onsite personnel including sub-contractors in low energy construction skills. Appoint sustainability champions to ensure that the project continues to perform in a sustainable manner.
- **Sustainable Transportation:** Encourage carpooling, use of public transportation, or electric vehicles for workers commuting to the site.
- **Monitoring and Reporting:** Regularly monitor and report GHG emissions from the construction site. This helps in identifying areas for improvement and ensuring compliance with environmental standards Sustainability spot checks should be added to ongoing site inspections and feedback shared with all onsite to ensure measures are being adopted.

- **Maintenance:** Ensure all plant and machinery are well maintained and inspected regularly.
- **Waste Management:** Implement a robust waste management plan to reduce, reuse, and recycle construction waste. Proper waste management can significantly cut down on emissions. Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. Application of the waste hierarchy to all waste material generated.
- **Sustainable Procurement:** Sourcing low carbon materials locally where possible to reduce transport related CO2 emissions.

17.2.6.1.2 Monitoring

We recommend the following monitoring strategies to ensure compliance with the environmental objectives outlined in this EIA. These strategies are essential for effectively managing the environmental impacts associated with the demolition and construction phases, with a particular focus on resource recovery, waste management, and the reduction of GHG emissions.

Monitoring of Demolition Waste Reuse and Recycling

To optimise the reuse and recycling of demolition materials, we recommend implementing the following:

- **Material Reuse Tracking System:** A digital tracking system could be established to monitor materials identified for reuse or recycling. This system will log details such as quantities, conditions, and intended applications within the new construction areas. It is important that this system is regularly updated to reflect ongoing recovery efforts.
- **Weekly Progress Reports:** It is suggested that the demolition contractor be required to submit weekly progress reports. These reports should provide detailed metrics on the volumes of materials recovered, reused, and recycled, alongside any challenges encountered. This approach will allow for the early identification of issues and timely adjustments to the recovery plan.
- **Regular On-Site Inspections:** It is suggested that regular inspections are conducted to verify that materials earmarked for reuse are being properly stored and handled. These inspections should ensure that materials remain in suitable condition for their intended use in the new build areas.

Competency and Performance of Demolition Contractor

To ensure that the demolition process aligns with the project's environmental goals, we propose the following monitoring measures:

- **Verification of Pre-Demolition Audit:** The pre-demolition audit conducted by the appointed contractor should be thoroughly reviewed to confirm that all materials and components suitable for reuse or recycling have been accurately identified. This review will ensure that the audit reflects best practice in resource recovery.
- **Periodic Contractor Performance Reviews:** We suggest conducting periodic performance reviews of the demolition contractor. These reviews should focus on their adherence to the resource recovery plan, the accuracy of material identification, and their overall compliance with project timelines without compromising environmental standards.

Compliance with EU Taxonomy for Circular Economy

Given the project's commitment to meeting EU taxonomy requirements, we recommend the following:

- **Comprehensive Documentation and Reporting:** It is essential to maintain detailed records that document compliance with the circular economy principles outlined in the EU taxonomy. This documentation should include logs of all recycled materials, percentages of materials reused on-site, and detailed descriptions of how circular economy practices are being implemented.
- **Independent Third-Party Audits:** It is suggested that an independent auditor is engaged to periodically assess the project's compliance with the EU taxonomy. The audit should verify the accuracy of reported data and ensure that the circular economy requirements are fully adhered to throughout the project.

Monitoring of GHG Emissions Reduction Measures

To mitigate the project's impact on climate change, the following monitoring activities are proposed:

- **Appoint sustainability champions** to ensure that the project continues to perform in a sustainable manner including monitoring and reporting of performance on site.
- **Idle Time Monitoring for Vehicles and Machinery:** It is suggested that GPS or telematics systems are installed on all vehicles and machinery used on-site to monitor engine idling times. Automatic alerts should be set up to notify site managers when idling exceeds a specified threshold, enabling prompt corrective action to reduce unnecessary emissions.
- **Maintenance Logs for Plant and Machinery:** Implementing a digital maintenance log system to track the inspection and maintenance of all on-site equipment is recommended. This system should record inspection dates, maintenance activities, and any identified issues, ensuring that all machinery operates efficiently and with minimal emissions.
- **Material Waste Minimisation Tracking:** A monitoring system should be developed to track material orders and usage. This system should identify trends in over-ordering or inefficient material use, enabling the project team to take corrective actions that will help minimise the embodied carbon footprint of the site.

Application of Waste Hierarchy

To optimise waste management on-site, the following monitoring protocols are suggested:

- **Waste Segregation Audits:** Regular audits should be conducted to ensure that waste is being properly segregated according to the waste hierarchy (reduce, reuse, recycle). These audits will help identify opportunities for improving waste management practices and reducing overall waste generation.
- **Monthly Waste Management Reports:** It is suggested that monthly reports are generated detailing the volume of waste reduced, reused, and recycled. These reports should be compared against predefined targets to assess the effectiveness of the waste management strategies and to identify areas for improvement.

Local Sourcing of Materials

To reduce transport-related emissions and support local suppliers, the following measures are suggested:

- **Supplier Distance Monitoring:** A database of suppliers should be developed, documenting the distance of each supplier from the construction site. This database should be used to monitor and minimise the carbon footprint associated with material transportation, prioritising local suppliers wherever possible.
- **Transport-Related Carbon Footprint Analysis:** Conducting a carbon footprint analysis for the transportation of all materials to the site is recommended. This analysis should inform the selection of suppliers, with a preference for those within a closer radius to reduce CO₂ emissions.

These monitoring recommendations are designed to ensure that the project adheres to its environmental commitments, particularly in the areas of resource recovery, waste management, and greenhouse gas emissions reduction. By implementing these strategies, the project will not only comply with regulatory requirements but also contribute to broader environmental sustainability goals. Regular reporting, on-site inspections, and third-party audits will be critical to maintaining compliance and achieving the desired environmental outcomes.

17.2.6.2 Operational Phase

17.2.6.2.1 Mitigation

A number of measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the Proposed Development to climate change.

The Proposed Development has been designed to reduce the impact on climate as a result of energy usage during operation. There are a number of incorporated design mitigation measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible.

Such measures included in the Proposed Development to reduce the impact to climate are:

- **Landscape Design Considerations include:**
 - **Biodiversity Net Gain (BNG):** Hedgerows will be planted to enhance biodiversity. This involves planting 500 linear meters of diverse species such as Hawthorn, Blackthorn, Crab Apple, Willow, and Holly. Additionally, a secondary hedgerow will be planted inside the existing hedge, doubling its width and adding 290 linear meters. This increased vegetation will help sequester carbon and improve air quality.
 - **Compensatory Woodland Planting:** A new native woodland planting area of 1000m² is to be planted to the south of the site. The selected native tree species, such as Scots Pine, Common Holly, Common Alder, Downy Birch, Willow, Bird Cherry, and Common Oak, are compatible with the existing site conditions and will contribute to carbon sequestration.
 - **Retention of Existing Landscape Features:** The Proposed Development seeks to retain as many existing landscape features as possible, including stands of

trees, hedgerows, and grassland meadows. This minimizes the need for new planting and reduces the carbon footprint associated with landscaping activities.

- Use of Native Species: The planting of native species is emphasized throughout the design. Native species are well-adapted to the local environment, requiring less maintenance and reducing the need for chemical inputs such as fertilizers and pesticides.
- Hay Strewing for Meadow Restoration: The construction works will include the decommissioning of the existing grass runway and the restoration of the meadow using a process called Hay Strewing. This involves collecting seed from the existing meadow and distributing it on bare soil, avoiding the need for imported seed and reducing the carbon footprint associated with transportation.
- Pollarding of Hedgerows: The existing hedgerows will be reduced to a maximum height of 2 meters at several locations to facilitate the approach to the runway. This practice helps maintain the health of the hedgerows and reduces the need for frequent pruning, thereby lowering carbon emissions from maintenance activities.
- Low-Carbon Operational Practices include:
 - Transition to Sustainable Aviation Fuel (SAF): By 2030, the club aims to convert its Cessna aircraft to SAF, which will be available from Cork airport by 2025. SAF is expected to reduce CO₂ emissions by 90%, noise by 40%, and increase the aircraft's range by 40%, thereby reducing refuelling requirements.
 - Adoption of Electric Planes: By 2040 to 2050, the club plans to have all its planes either using SAF or being fully electric. Electric planes, which are anticipated to become more viable and economical over the next 15 to 20 years, will further reduce noise and operating costs.
 - Solar Panels on Aircraft Hangar Roof: The club envisions utilizing solar panels on the aircraft hangar roof to provide clean power for the site. This will reduce the reliance on grid electricity and lower indirect emissions associated with energy consumption.
 - Efficient Aircraft Operations: The increased range of SAF-powered aircraft will reduce the frequency of refuelling, leading to lower emissions associated with fuel transportation and handling.
 - Improved Runway and Taxiway Design: The construction of a hard-surfaced runway, taxiway, and helipad with associated ground-level lighting will enhance the efficiency and safety of aircraft operations, potentially reducing fuel consumption and emissions during take-off and landing.

In addition, electric vehicle and bicycle parking will be provided within the development which will promote the use of more sustainable modes of transport and reduce potential transport emissions.

17.2.6.2.2 Monitoring

Environmental Management Plan that incorporates adaptive management principles.

Ensure climate change resilience plans are robust; continued monitoring of trends in weather events; and continued review of resilience measures related to interdependencies.

We recommend the following monitoring strategies to ensure that the Proposed Development meets its environmental objectives. These strategies focus on mitigating the impacts of climate change, enhancing energy efficiency, and promoting sustainable transport, all of which are aligned with best practices outlined in ISEP guidelines.

Monitoring of Climate Change Mitigation Measures

- **Attenuation and Drainage Systems Monitoring:** Consistent with ISEP's guidance on climate resilience, regular inspections should be undertaken to verify the functionality of the attenuation and drainage systems. These inspections should be conducted during construction, after significant rainfall events, and periodically thereafter to ensure long-term effectiveness in preventing flooding.
- **Climate Vulnerability Assessment Review:** In accordance with ISEP's recommendation to periodically reassess climate risks, we suggest reviewing the climate vulnerability assessment (as detailed in Section 9.7.3) at regular intervals. This review should incorporate the latest climate projections to ensure the mitigation measures remain adequate and effective.

Monitoring of Energy Efficiency and Climate Impact Reduction

To minimise the environmental impact of aircraft operations and align with Rathcool Flying Club's sustainability objectives, the following monitoring measures are recommended:

- **Fuel Efficiency Monitoring:** Track fuel consumption per flight hour and per passenger to ensure efficient engine performance. Implement regular engine health checks and propeller balancing to maintain optimal efficiency.
- **Carbon Emissions Tracking:** Record and report CO₂ emissions for all flights. Compare performance against industry benchmarks and identify opportunities for reduction through operational improvements.
- **Sustainable Aviation Fuel (SAF) Integration:** Where feasible, monitor the use of SAF or blended fuels. Establish targets for SAF adoption and verify compliance through fuel purchase records.
- **Flight Planning Optimisation:** Monitor adherence to efficient flight planning practices, including optimal routing, reduced taxi times, and weight management. Use GPS and flight data to assess and improve operational efficiency.
- **Maintenance and Engine Performance Audits:** Conduct periodic audits to ensure engines and systems are operating within manufacturer specifications for fuel burn and emissions. Implement predictive maintenance to avoid inefficiencies.
- **Noise and Environmental Impact Monitoring:** Track noise levels during take-off and landing to ensure compliance with local regulations and minimise community impact. Consider quieter approach procedures where possible.

Monitoring of Sustainable Transport Initiatives

To promote sustainable transport and reduce transport-related emissions, the following monitoring strategies are suggested:

- **Electric Vehicle (EV) and Bicycle Parking Usage:** Regular monitoring should be carried out to assess the usage of electric vehicle charging stations and bicycle parking facilities within the development. This will help gauge the effectiveness of these measures in promoting sustainable transport modes. Usage data can inform whether additional facilities or adjustments are needed.
- **Transport Emissions Impact Assessment:** Periodic assessments should be conducted to evaluate the impact of the provided sustainable transport facilities on reducing overall transport emissions. This could include monitoring the uptake of electric vehicles by residents and the corresponding reduction in GHG emissions.

These monitoring recommendations are designed to ensure that the development's climate change mitigation measures, energy efficiency initiatives, and sustainable transport provisions are effectively implemented and maintained throughout the lifecycle of the project. By adhering to these strategies, the development will not only comply with relevant regulatory requirements but also contribute to broader environmental sustainability goals. Regular inspections, energy performance assessments, and occupant engagement will be crucial to achieving the desired environmental outcomes.

17.2.7 Noise and Vibrations

17.2.7.1 Construction Phase

17.2.7.1.1 Mitigation

Many general measures can reduce noise levels at the source, such as:

- (a) avoid unnecessary revving of engines and switch off equipment when not required.
- (b) keep internal haul routes well maintained and avoid steep gradients.
- (c) use rubber linings in, for example, chutes and dumpers to reduce impact noise.
- (d) minimise drop height of materials.
- (e) start-up plants and vehicles sequentially rather than all together.

The movement of the plant onto and around the site should be in accordance with the site's normal operating hours and the location of any Noise Sensitive Premises (NSPs) as far as is reasonably practicable.

Conventional audible reversing alarms have caused problems on some sites, and alternatives are available. Audible reversing warning systems on mobile plant and vehicles should be of a type that, while ensuring proper warning, has minimal noise impact on persons outside the site. When reversing, mobile plant and vehicles should travel in a direction away from NSPs whenever possible.

Specification and Substitution

Where a construction site is within a noise-sensitive area, the plant and activities to be employed on that site should be reviewed to ensure that they are the quietest available for the required purpose; this is following the best practicable means for an existing operational site, where reasonably practicable, noisy plant or activities should be replaced by less noisy alternatives if noise problems are occurring.

Use and Siting of Equipment.

The construction plant should always be used according to the manufacturer's instructions. Site equipment should be kept out of noise-sensitive areas, and loading and unloading should also be carried out outside such areas.

Any construction plant from which the noise generated is known to be notably directional should, wherever practicable, be orientated so that the noise is directed away from noise-sensitive areas. Acoustic covers for engines should be kept closed when engines are in use or idling. If compressors are used, they should have effective acoustic enclosures and be designed to operate when their access panels are closed.

Materials should be lowered whenever practicable and should not be dropped. A resilient material should cover the surfaces on which the materials are being moved. When a site is in a residential area, lorries should not arrive or depart at times inconvenient to residents.

Maintenance

Regular and effective maintenance by trained personnel is essential and will do much to reduce noise from plant and machinery. Increases in plant noise are often indicative of future mechanical failure.

Sound-reducing equipment can lose its effectiveness before failure is indicated by visual inspection.

Noise from vibrating machinery with rotating parts can be reduced by proper balancing. Frictional noise from the cutting action of tools and saws can be reduced by keeping them sharp. Noises caused by friction in conveyor rollers, trolleys and other machines can be reduced by proper lubrication.

Controlling the Spread of Noise

General

If noisy processes can be avoided, the noise reaching the noise-sensitive area will be reduced. Alternative methods include increasing the distance between the noise source and the sensitive area or installing noise-reduction screens, barriers, or bunds.

Distance

Increasing the distance from NSPs is often the most effective noise control method. However, this might not be possible when work is conducted on a restricted site or in fixed structures, such as railway tracks. Stationary plant, such as compressors and generators, should be located away from noise-sensitive areas.

Screening

Screening may be considered at sites where it is impossible to mitigate a noise problem by increasing the distance between the source and receiver. For maximum benefit, screens should be close to the noise source (as with a stationary construction plant) or the listener. Careful positioning of noise barriers, such as bunds or screens, can significantly reduce noise levels. However, the visual impact of such obstacles should be considered.

Noise Control Targets

All reasonably practicable measures should be taken to protect local communities and individuals on construction sites from the detrimental effects of noise generated by construction operations.

Those seeking to determine suitable noise control targets for construction operations should be aware of the noise problems that can arise when such operations occur in existing buildings, whether occupied or adjacent to occupied buildings. Vibration introduced directly into the structure by equipment such as breakers, hammers, and drills may attenuate slowly as it is transmitted through the structure and produce unacceptable noise levels in rooms remote from the source. In particularly sensitive situations, alternative techniques and equipment might be necessary.

Monitoring noise at sites where noise is an issue should be considered essential. Measurement may be carried out for several reasons, including the following:

- (1) to allow the performance of noise control measures to be assessed;
- (2) to ascertain noise from items of plant for planning purposes;
- (3) to confirm that planning requirements have been complied with.

Monitoring positions should reflect the purpose for which monitoring is carried out.

Monitoring to determine whether an item of plant or a particular process meets an anticipated noise criterion, or whether noise control methods are effective, may require measurements to be taken close to the plant or process to minimise interference from other noise sources.

Monitoring to confirm that planning conditions imposed to protect local occupants have been met may be undertaken at NSPs or at the site boundary, with any necessary corrections applied. The choice of noise measurement locations to be included in the planning conditions should reflect the requirement to accurately assess noise. Monitoring is the responsibility of the site operator and should be carried out by suitably trained personnel.

17.2.7.1.2 Monitoring

The contractor will be required to ensure that construction activities operate within the noise and vibration limits set out in this assessment and undertake regular noise and vibration monitoring at locations representative of the closest sensitive locations to ensure the relevant criteria are not exceeded.

Noise monitoring should follow the International Standard ISO 1996:2017, Acoustics – Description, measurement, and environmental noise assessment.

Following BS 6472 for human disturbance, vibration monitoring, and BS ISO 4866:2010 for building damage should be conducted.

17.2.7.2 Operational Phase

17.2.7.2.1 Mitigation

When we assess noise changes relative to the existing noise climate, we observe insignificant operational changes. It is proposed that the Aerodrome should develop a 'fly neighbourly' programme whereby users of the Aerodrome could be made aware of noise-sensitive areas surrounding the airport and endeavour to reduce the impact of aircraft noise. Given the volume of aircraft movements at Rathcoole Aerodrome, operational noise is not of notable significance compared to busier regional airports. The 'fly neighbourly' programme must consider operational and safety constraints, which are paramount in agreeing to approaches and departures from the Aerodrome.

In conducting a robust and comprehensive assessment, we have also considered impulsivity and tonality associated with the proposed operational changes. It is essential to highlight that while our investigative site work considered both impulsivity and tonality, aircraft noise is generally not impulsive. Nonetheless, all our measurements accounted for both factors in the overall noise assessment. This analysis determined that the new aircraft under consideration did NOT exhibit impulsive or tonal characteristics. When measured, we can conclude that noise from the HEMS Eurocopter EC135T is neither impulsive nor tonal, as assessed objectively (using the method defined in ISO 1996-2:2017). It is unnecessary to correct the measured levels if they have been objectively demonstrated to be non-impulsive and non-tonal.

The projected annual flight movements are expected to rise from 2,533 to 4,499 over five years, an increase of 1,966 movements. This is estimated to result in an average increase of

about + 2.5 dB in noise at residential locations over 5 years. The change is considered moderate and not significant, with a permanent but barely noticeable effect on noise levels.

The proposed 140 m runway extension and resurfacing at Rathcool are aimed solely at improving safety, providing longer take-off and landing distances. Upgrading from grass to tarmac reduces the engine power needed for take-off, lowering noise levels. The changes will not alter the type, classification, or volume of aircraft using the runway. Overall, the improvements enhance operational safety while potentially reducing noise without increasing aviation activity.

17.2.7.2.2 Monitoring

Post-construction, it is common practice (**six months after operation**) to undertake a noise verification study to confirm that actual operational noise levels align with those predicted during the assessment. Such a study would verify the noise impacts arising from the development once operational. The requirement for post-completion noise monitoring would be at the discretion of the planning authority and would serve to confirm compliance with the predicted and assessed noise levels.

17.2.8 Landscape and Visual

17.2.8.1 Construction Phase

17.2.8.1.1 Mitigation

The Proposed Development will be visible during the construction phase. The provision of site hoarding along the property boundaries will also be visible. Construction machines may become visible from neighbouring properties and also from a number of more distant vantage points as the development proceeds. The machines and site facilities are generally viewed as a temporary and unavoidable feature of construction.

Mitigation measures proposed during the construction stage of the Proposed Development, revolve primarily around the implementation of appropriate site management procedures during the construction works – such as the control of lighting, storage of materials, placement of compounds, control of vehicular access, and effective dust and dirt control measures, etc. The Construction and Environmental Management Plan for the project, submitted with the planning application, sets out the basic measures to be employed in order to mitigate potential negative effects during construction. This is a working document which is refined and added to as the project proceeds.

17.2.8.1.2 Monitoring

Several hedgerows will require annual maintenance to retain the existing vegetation at a maximum of 2 meters in height.

The success of the Proposed Development is dependent on the proposals being properly executed as approved. Detailed agreement on finishes and materials to be employed needs to be ensured through the provision of and on-going adherence to reference samples provided on site for the duration of the construction works period.

17.2.8.2 Operational Phase

17.2.8.2.1 Mitigation

The designed scheme seeks to facilitate safer emergency airlift access. The design rationale and detail employed seeks to mitigate potential negative effects on the landscape character and visual amenity of the area by:

- Minimising lighting;
- The insertion, and positioning of the proposed building close to the existing local road in order to assist in the visual assimilation of their mass;
- Use of appropriate materials. The buildings' external envelopes will consist primarily of steel and will appear visually similar to agricultural type buildings.

17.2.8.2.2 Monitoring

No specific operational phase monitoring is required for Landscape and Visual.

17.2.9 Archaeology and Cultural Heritage

17.2.9.1 Construction Phase

17.2.9.1.1 Mitigation

Archaeological monitoring of ground excavation works during the construction phase will be carried out by a suitably qualified archaeologist under licence by the National Monument Service. In the event that any archaeological sites or features are identified during monitoring, ground works will halt at that location while they are recorded and then left to remain securely *in situ* within a cordoned off area. The National Monuments Service and the Cork County Council Archaeologist will be notified of the discovery and consulted to determine further appropriate mitigation measures, which may entail preservation *in situ* by avoidance or preservation by record through a licensed archaeological excavation. The appointed archaeologist will also compile an advance written and photographic record of the section of the townland boundary between Rathcool and Knockcahill located within the footprint of the proposed construction works. All ground works within the environs of the townland boundary will also be subject to archaeological monitoring.

The appointed archaeologist will also supervise the establishment of an archaeological exclusion area delimited by secure fencing around the extent of the levelled ringfort (CO030-145----) within the proposed development site. Per consultations with the Cork County Council Archaeologist during the compilation of this assessment, the archaeological exclusion area will be set at a distance of 15m from the outer edge of the ringfort enclosure, as visible on aerial/satellite imagery (Figures 17-2). This fencing will remain in place for the duration of the construction phase and the archaeological exclusion area will be clearly signed as a 'no entry area'. No ground reduction works or other ancillary development works including, but not limited to, drainage/services, spoil storage, traffic/parking, compounds, or landscaping/planting, will occur within the archaeological exclusion area.



Figure 17-2: Extent of Archaeological Exclusion Area

There are no Protected Structures or structures/gardens listed in the NIAH located within the proposed development site and it is not situated within, or in the environs of, an Architectural Conservation Area. In addition, the proposed development site does not contain any undesignated structures of cultural heritage significance such as vernacular structures. No mitigation measures for the architectural heritage resource are, therefore, required. The construction phase of the proposed development will not result in any predicted effects on other aspects of the architectural cultural heritage resource that will require mitigation.

17.2.9.1.2 Monitoring

There are a number of obligatory processes required as part of archaeological licence applications to the National Monuments Service and these will allow for monitoring of the successful implementation of the construction phase mitigation measures presented. A method statement detailing the proposed strategy for archaeological supervision of ground works during the construction phase will be submitted to the National Monuments Service as part of the licence application. This will clearly outline the proposed extent of ground works and outline the consultation process to be enacted in the event that any unrecorded archaeological remains are identified, which may include preservation in situ by avoidance or preservation in record by archaeological excavation. A report will be compiled on all archaeological site investigations which will clearly present the results in written, drawn and

photographic formats. Copies of this report will be submitted to the National Monuments Service, Cork County Council and the National Museum of Ireland.

17.2.9.2 Operational Phase

17.2.9.2.1 Mitigation

The levelled ringfort (CO030-145----) located within the boundary of the proposed development does not retain any surviving above ground traces and, therefore, no screening, monitoring or maintenance of extant remains of the archaeological site will be required during the operational phase of the Proposed Development.

The location of the ringfort and its surrounding 15m exclusion area will be excluded from any potential future development proposals within the boundary of the Proposed Development.

The location of the ringfort and the surrounding 15m area will be clearly identified (and mapped) as an archaeological exclusion area on relevant site management plan documents, including, but not limited to plans in relation to vegetation maintenance, landscaping, contractor inductions, health/safety and emergency procedures.

The location of the exclusion area will be clearly marked by a permanent sign located outside its outer edge which will identify the location as an archaeological exclusion area.

No landscaping, tree-planting, tree root removal, drainage, traffic, storage or other works which will have the potential to result in ground disturbance that may directly impact any sub-surface archaeological deposits, features or objects will occur within the archaeological exclusion zone during the operational phase.

The maintenance of the archaeological exclusion area will be limited to periodic grass-cutting and strimming of roadside trees as required (above ground only), and this will only occur during dry weather conditions in order to minimise any potential disturbance of the existing ground surface within the area.

Given the nature of the proposed aerodrome development no livestock or tillage farming, which have the potential to result in ground disturbance by trampling or ploughing, will occur within the archaeological exclusion area during the operation phase.

A suitably qualified archaeologist will be retained to advise on the design of any future proposed development works, if any, located within the environs of the archaeological exclusion zone and to prepare an archaeological impact assessment of any such development. This will include a process of consultation with the Cork County Council Archaeologist and the National Monuments Service.

17.2.9.2.2 Monitoring

A suitably qualified archaeologist will be retained to advise on the design of any potential future proposed developments (if any) within the aerodrome property which are located within the environs of the archaeological exclusion area around Ringfort CO030-145----. The appointed archaeologist will prepare an archaeological impact assessment of any such proposed development which will be carried out in consultation with the Cork County Council Archaeologist and the National Monuments Service.

17.2.10 Materials Assets – Traffic

17.2.10.1 Construction Phase

17.2.10.1.1 Mitigation

The parking of contractor's vehicles will be set out on site, ensuring traffic does not cause any unnecessary congestion and potential traffic hazards along the public road. All trucks are to enter site and are not to park on the public road.

17.2.10.1.2 Monitoring

Refer to the CEMP for more details in relation the expected traffic associated with the construction phase of the project. If deemed to be required, site specific TMP's will be developed by the contractor to minimise the impact of the works on the existing road network.

Deliveries will be timed and coordinated to avoid conflict with collection of waste, other deliveries (particularly adjoining landowners) and rush hour traffic (AM & PM peak hours as identified in the Traffic chapter). Large deliveries will be scheduled outside peak hours to minimise disruption.

17.2.10.2 Operational Phase

17.2.10.2.1 Mitigation

No Operational Phase measures required

17.2.10.2.2 Monitoring

The number of members is expected to increase from the current 43 up to 60 people by 2029. It is expected that this increase in members will result in an increase in peak daily car trips from 9 to 13. The site is not open to the general public and so no additional traffic flows are expected to and from the development from the general public. The majority of visitors to the site are via air and use the site for refuelling etc. If the projected traffic figures change based on the developments, the traffic modelling figures can be revised to reflect any changes.

17.2.11 Materials Assets – Waste and Utilities

17.2.11.1 Construction Phase Mitigation

As the use of material assets for the Proposed Development is considered to be minimal, it is not foreseen that mitigation measures will be required for the Proposed Development during the construction phase.

17.2.11.2 Operational Phase Mitigation

As the use of material assets for the Proposed Development is considered to be minimal, it is not foreseen that mitigation measures will be required for the Proposed Development during the operational phase.

17.2.11.3 Monitoring for Construction and Operation Phase

During the construction phase, an environmental monitoring programme will be developed and implemented by a site Contractor for the operational lifetime of the Proposed Development. The monitoring programme will verify (i) that implemented controls prevent and minimise emissions from the Proposed Development and (ii) that there is no negative impact on the receiving environment via uncontrolled releases of pollutants, sediment, dust, noise or vibration. The monitoring programme and sampling frequency will be agreed with Cork County Council.



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