

MOUNTAIN ROAD LRD

VOLUME II | EIAR

Main Statement



MOUNTAIN ROAD LRD

VOLUME II | Contents

CHAPTER ONE | Introduction

- 1.1 Introduction 1-1
- 1.2 Proposed Development Site 1-2
- 1.3 Requirement for EIAR 1-4
- 1.4 Purpose of Environmental Impact Assessment 1-5
- 1.5 Content of Environmental Impact Assessment Report.....1-5
- 1.6 Competency.....1-5
- 1.7 Format and Structure of the EIAR.....1-5
- 1.8 Scoping.....1-6
- 1.9 Scope of Cumulative Effects 1-6
- 1.10 Impact Assessment Methodology 1-7
- 1.11 Consultation 1-8

CHAPTER TWO | Project Description

- 2.1 Introduction 2-1
- 2.2 Expertise and Qualifications 2-1
- 2.3 Proposed Development Site 2-1
- 2.4 Demolition & Construction Phase.....2-10
- 2.5 Health and Safety.....2-12
- 2.7 Decommissioning.....2-12
- 2.8 Conclusion 2-12

CHAPTER THREE | Alternatives

3.1	Introduction	3-1
3.2	Expertise and Qualifications	3-1
3.3	Consideration of Alternatives	3-1
3.4	Difficulties Encountered.....	3-7
3.5	Conclusion	3-7

CHAPTER FOUR | Population & Human Health

4.1	Introduction	4-1
4.2	Expertise and Qualifications	4-1
4.3	Proposed Development	4-1
4.4	Methodology	4-1
4.5	Baseline Environment.....	4-2
4.6	The ‘Do Nothing’ Scenario	4-15
4.7	Difficulties Encountered	4-15
4.8	Consultation.....	4-15
4.9	Impact Assessment.....	4-16
4.10	Mitigation Measures	4-18
4.11	Residual Impact Assessment	4-18
4.12	Interactions	4-18
4.13	Risk of Major Accidents or Disasters	4-20
4.14	Worst Case Scenario.....	4-20

4.15	Monitoring.....	4-20
4.16	Conclusion	4-20
4.17	References and Sources	4-20

CHAPTER FIVE | Landscape and Visual

5.1	Introduction	5-1
5.2	Expertise & Qualifications	5-1
5.3	Proposed Development	5-1
5.4	Methodology	5-1
5.5	Difficulties Encountered.....	5-4
5.6	Description of Existing Environment.....	5-5
5.7	Predicted Impacts	5-7
5.8	The ‘Do Nothing’ Scenario	5-11
5.9	Potential Significant Effects	5-12
5.10	Mitigation Measures	5-13
5.11	Residual Impact Assessment	5-13
5.12	Risk of Major Accidents or Disasters	5-13
5.13	Interactions.....	5-13
5.14	Monitoring	5-13
5.15	Summary of Mitigation and Monitoring	5-13
5.16	Conclusion	5-13
5.17	References and Sources	5-13

CHAPTER SIX | Material Assets: Traffic & Transport

6.1	Introduction	6-1
6.2	Expertise and Qualifications	6-1
6.3	Proposed Development	6-1
6.4	Methodology	6-1
6.5	Potential Environmental Effects	6-2
6.6	Difficulties Encountered.....	6-3
6.7	Baseline Environment	6-3
6.8	The ‘Do Nothing’ Scenario	6-7
6.9	Characteristics of the Proposed Development	6-8
6.10	Potential Significant Effects	6-8
6.11	Trip Generation	6-11
6.12	Traffic Distribution	6-11
6.13	Accidents and Safety	6-14
6.14	Residual Impact Assessment	6-14
6.15	Mitigation Measures	6-14
6.16	Summary of Post-mitigation Effects	6-15
6.17	Risk of Major Accidents or Disasters	6-17
6.18	Worst Case Scenario	6-17
6.19	Interactions.....	6-17
6.20	Monitoring.....	6-17
6.21	Summary of Mitigation and Monitoring	6-17

6.22	Conclusion	6-18

6.23	References and Sources	6-18

CHAPTER SEVEN | Material Assets: Built Services

7.1	Introduction	7-1
7.2	Expertise & Qualifications	7-1
7.3	Proposed Development	7-1
7.4	Methodology	7-2
7.5	Difficulties Encountered	7-3
7.6	Baseline Environment.....	7-3
7.7	The ‘Do Nothing’ Scenario	7-5
7.8	Potential Significant Effects	7-5
7.9	Mitigation Measures.....	7-8
7.10	Residual Impact Assessment	7-10
7.11	Risk of Major Accidents or Disasters	7-12
7.12	Worst Case Scenario	7-12
7.13	Interactions.....	7-12
7.14	Monitoring	7-12
7.15	Summary of Mitigation and Monitoring	7-12
7.16	Conclusion	7-13
7.17	References and Sources	7-13

CHAPTER EIGHT | Material Assets: Waste

8.1 Introduction 8-1

8.2 Expertise & Qualifications 8-1

8.3 Proposed Development 8-1

8.4 Methodology 8-1

8.5 Difficulties Encountered.....8-2

8.6 Baseline Environment.....8-2

8.7 The ‘Do Nothing’ Scenario 8-2

8.8 Potential Significant Effects 8-2

8.9 Mitigation Measures.....8-5

8.10 Residual Impact Assessment 8-7

8.11 Risk of Major Accidents or Disasters 8-7

8.12 Worst Case Scenario 8-7

8.13 Interactions.....8-7

8.14 Monitoring.....8-8

8.15 Summary of Mitigation and Monitoring 8-8

8.16 Conclusion 8-8

8.17 References and Sources 8-8

CHAPTER NINE | Land & Soils

9.1 Introduction 9-1

9.2 Expertise & Qualifications 9-1

9.3 Proposed Development 9-1

9.4 Methodology 9-2

9.5 Difficulties Encountered.....9-3

9.6 Baseline Environment.....9-4

9.7 The ‘Do Nothing’ Scenario 9-8

9.8 Potential Significant Effects 9-8

9.9 Mitigation Measures.....9-10

9.10 Residual Impact Assessment 9-12

9.11 Risk of Major Accidents or Disasters 9-14

9.12 Worst Case Scenario 9-14

9.13 Interactions.....9-14

9.14 Monitoring 9-15

9.15 Conclusion 9-15

9.16 References and Sources 9-15

CHAPTER TEN | Water & Hydrology

10.1 Introduction.....10-1

10.2 Expertise & Qualifications 10-1

10.3 Proposed Development 10-1

10.4 Methodology 10-3

10.5 Difficulties Encountered 10-5

10.6 Baseline Environment.....10-5

10.7 The ‘Do Nothing’ Scenario 10-14

10.8 Potential Significant Effects 10-14

10.9 Mitigation Measures 10-17

10.10 Water Framework Directive 10-20

10.11 Residual Impact Assessment 10-20

10.12 Risk of Major Accidents or Disasters 10-23

10.13 Worst Case Scenario.....10-23

10.14 Interactions 10-23

10.15 Monitoring 10-24

10.16 Conclusion 10-24

10.17 References and Sources 10-24

CHAPTER ELEVEN | Biodiversity

11.1	Introduction.....	11-1
11.2	Description of the Proposed Development	11-2
11.3	Methodology	11-6
11.4	Zone of Influence.....	11-6
11.5	Identification of Relevant Designated Sites.....	11-6
11.6	Field Surveys.....	11-7
11.7	Ecological Assessment	11-9
11.8	Limitations	11-10
11.9	Ecological Baseline Conditions	11-11
11.10	Ecological Impact Assessment.....	11-29
11.11	Avoidance, Mitigation, Compensation and Enhancement Measures	11-32
11.12	Monitoring	11-35
11.13	Residual Impact Assessment	11-36
11.14	Interactions	11-36
11.16	References and Sources	11-36

CHAPTER TWELVE | Noise & Vibration

12.1	Introduction.....	12-1
12.2	Expertise & Qualifications	12-1
12.3	Proposed Development.....	12-1
12.4	Methodology	12-1
12.5	Difficulties Encountered	12-4
12.6	Baseline Environment.....	12-4
12.7	The ‘Do Nothing’ Scenario.....	12-6
12.8	Characteristics of the Proposed Development.....	12-6
12.9	Potential Significant Effects	12-7
12.10	Mitigation Measures	12-11

12.11	Residual Impact Assessment	12-13
12.12	Risk of Major Accidents or Disasters	12-14
12.13	Interactions	12-14
12.14	Monitoring	12-14
12.15	Conclusion	12-14
12.16	References and Sources	12-14

CHAPTER THIRTEEN | Air Quality & Climate

13.1	Introduction.....	13-1
13.2	Expertise & Qualifications	13-5
13.3	Guidance.....	13-5
13.4	Proposed Development	13-5
13.5	Methodology	13-6
13.6	Difficulties Encountered	13-16
13.7	Baseline	13-16
13.8	The ‘Do Nothing’ Scenario	13-18
13.9	Potential Significant Effects	13-18
13.10	Mitigation Measures	13-22
13.11	Residual Impact Assessment	13-23
13.12	Risk of Major Accidents or Disasters	13-23
13.13	Worst Case Scenario.....	13-24
13.14	Interactions	13-24
13.15	Monitoring	13-24
13.16	Conclusion	13-25
13.17	References and Sources	13-25

CHAPTER FOURTEEN | Cultural Heritage: Archaeology & Built Heritage

14.1 Introduction.....14-1

14.2 Expertise & Qualifications 14-1

14.3 Proposed Development.....14-1

14.4 Methodology 14-1

14.5 Difficulties Encountered 14-4

14.6 Baseline Environment.....14-4

14.7 The ‘Do Nothing’ Scenario 14-11

14.8 Potential Significant Effects 14-11

14.9 Mitigation Measures 14-13

14.10 Residual Impact Assessment 14-13

14.11 Risk of Major Accidents or Disasters 14-13

14.12 Worst Case Scenario.....14-13

14.13 Interactions 14-13

14.14 Monitoring 14-14

14.15 Conclusion 14-14

14.16 References and Sources 14-14

CHAPTER FIFTEEN | Risk of Major Accidents and Disasters

15.1 Introduction.....15-1

15.2 Expertise & Qualifications 15-1

15.3 Methodology 15-1

15.4 Proposed Development.....15-2

15.5 Description of Existing Environment 15-2

15.6 Environmental Receptors 15-4

15.7 Predicted Impacts 15-7

15.8 Mitigation Measures 15-7

15.9 Residual Impacts.....15-7

15.10 References.....15-7

CHAPTER SIXTEEN | Interactions of the Foregoing

16.1 Introduction.....16-1

16.2 Population and Human Health 16-1

16.3 Landscape and Visual 16-1

16.4 Material Assets: Traffic and Transport 16-1

16.5 Material Assets: Built Services.....16-1

16.6 Material Assets: Waste 16-2

16.7 Land and Soils.....16-2

16.8 Water & Hydrology.....16-2

16.9 Biodiversity.....16-2

16.10 Noise and Vibration.....16-2

16.11 Air Quality and Climate 16-3

16.12 Cultural Heritage – Archaeological and Built Heritage 16-3

CHAPTER SEVENTEEN | Summary of Proposed Mitigation Measures

17.1 Introduction.....17-1

CHAPTER ONE

INTRODUCTION



CHAPTER ONE

Table of Contents

Introduction

1.1 Introduction 1-1

1.2 Proposed Development Site 1-2

1.3 Requirement for EIAR 1-4

1.4 Purpose of Environmental Impact Assessment 1-5

1.5 Content of Environmental Impact Assessment Report..... 1-5

1.6 Competency 1-5

1.7 Format and Structure of the EIAR..... 1-5

1.8 Scoping..... 1-6

1.9 Scope of Cumulative Effects 1-6

1.10 Impact Assessment Methodology 1-7

1.11 Consultation 1-8

Table of Tables

Table 1-1 EIAR Chapters and Contributors	1-6
Table 1-2 Projects Considered for Cumulative Impact	1-7

Table of Figures

Figure 1.1 Proposed Site Layout (Source: Deady Gahan Architects)	1-2
Figure 1.2 Indicative Site Location	1-2
Figure 1.3 Indicative Site Boundary & Surrounding Context	1-3
Figure 1.4 Sample of Local Services, Amenities and Social Infrastructure (Source: McCutcheon Halley via ArcGis)	1-3
Figure 1.5 Land Use Zoning Objectives (Source: Cork County Development Plan, with indicative site boundary overlaid by McCutcheon Halley Planning Consultants).	1-4

CHAPTER ONE | Introduction

1.1 Introduction

This Environmental Impact Assessment Report (EIAR) was prepared by McCutcheon Halley Planning Consultants together with a team of specialist consultants on behalf of Bridgewater Homes Ltd. (the “Applicant”) who intend to apply for permission for the following Large Scale Residential Development (LRD) comprising the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

This Environmental Impact Assessment Report (EIAR) sets out the results of the environmental assessments which have been completed for the proposed development to inform the planning consent process.

The assessment has been completed as a statutory environment assessment. The environmental impact assessment process has been completed in line with Directive 2014/52/EU, based on the guidance presented in the Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA 2022).

EIA is a process for anticipating the effects on the environment caused by a development. Article 1(2)(g) of the 2014 Directive (2014/52/EU) states that:

- “Environment impact assessment” means a process consisting of:*
- (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 EIAR is a presentation of the potential environmental impacts of the proposed development with a focus on significant impacts.

Chapter 1 introduces the project and described the scope and methodology of the EIA process. The consultation process which was undertaken is outlined and the competencies of the environmental assessment team are provided.

1.1.1 Author Information and Competency

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master’s in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 2 years’ experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR’s, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, single ‘one – off’ developments, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

1.1.2 The Applicant

The applicant is Bridgewater Homes Ltd. Bridgewater Homes Ltd are an experienced housing and development firm who have contributed to the construction of new residential homes throughout the County of Cork, creating high-quality residential environments. They are seeking permission for this large scale residential development to add to the existing housing stock within Carrigaline, on lands that have been identified for the provision of new residential development.

1.1.3 Reference to Guidelines Relevant to Discipline

This chapter has been prepared having regard to the following guidelines:

- Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA), May 2022).
- EU Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017).
- EU Environmental Impact Assessment of Projects: Guidance on Scoping (EU, 2017).
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (OPR,2018).

1.1.4 Brief Project Description

A detailed description of the project is provided in Chapter 2. To summarise, the applicant seeks permission for the following Large Scale Residential Development (LRD) comprising the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

The overarching vision for this scheme is the establishment of a new residential community in this area of Carrigaline, which will promote compact growth in a location where the development can be served by public transport, walking and cycling.

The proposed development has been designed to provide high quality residential units with a wide range of different house and apartment types which ensures a housing mix that caters for a range of needs and backgrounds. The proposed layout focuses on the creation of distinctive streetscapes to create a warm and engaging environment which assists the overall placemaking vision.

The layout of the scheme has been shaped by the existing natural assets and ecological corridors on the site, with the aim of protecting the biodiversity on the site in the form of existing hedgerows and trees.



Figure 1.1 Proposed Site Layout (Source: Deady Gahan Architects)

1.2 Proposed Development Site

In general, the study area comprises the entire gross site area (refer to Figure 1.1). In general, the study areas are defined individually for each environmental topic, according to guidance and the geographic scope of the potential impacts or of the information required to assess those impacts. Details are provided by each discipline as part of the description of baseline conditions of the site.

1.2.1 Site Description

The site, which is 12.97 hectares in area, with a net developable area of 10.24 hectares, is located along Mountain Road, in the townland of Kilmoney, Carrigaline, Co. Cork.

The subject land is predominantly a greenfield site which has features and characteristics which will help create a positive living environment by retaining the natural assets and ecological features contained within its parkland setting. There are a number of natural hedgerow boundaries on each side of the site, with an overgrown area located in the centre of the site which provides an opportunity to create a natural and central amenity area. Along the eastern boundary of the site there are agricultural sheds, which are proposed for removal to facilitate the construction of residential units (see Figure 1.2)



Figure 1.2 Indicative Site Location

The area surrounding the lands comprise a mix of uses but are mostly residential and agricultural in character. There are a number of individual one-off dwelling houses located along Mountain Road, on both sides of the carriageway. To the south and west of the site are greenfield, agricultural lands, while to the east of the site is an existing farmyard. To the east of the southern portion of the proposed development is the existing Wheatfields residential estate, which consists of mostly two-storey large, detached dwelling units (see Figure 1.3).



Figure 1.3 Indicative Site Boundary & Surrounding Context

1.2.2 Surrounding Context

The site is situated to the south-west of Carrigaline is contained within the settlement boundary of the town, and is located c. 2km from the Main Street. Since the adoption of new local authority boundary changes in 2019, Carrigaline has become the largest town within Cork County and its growing population is sustained by the plethora of services, amenities and facilities which are provided within the town (see Figure 1.4.)

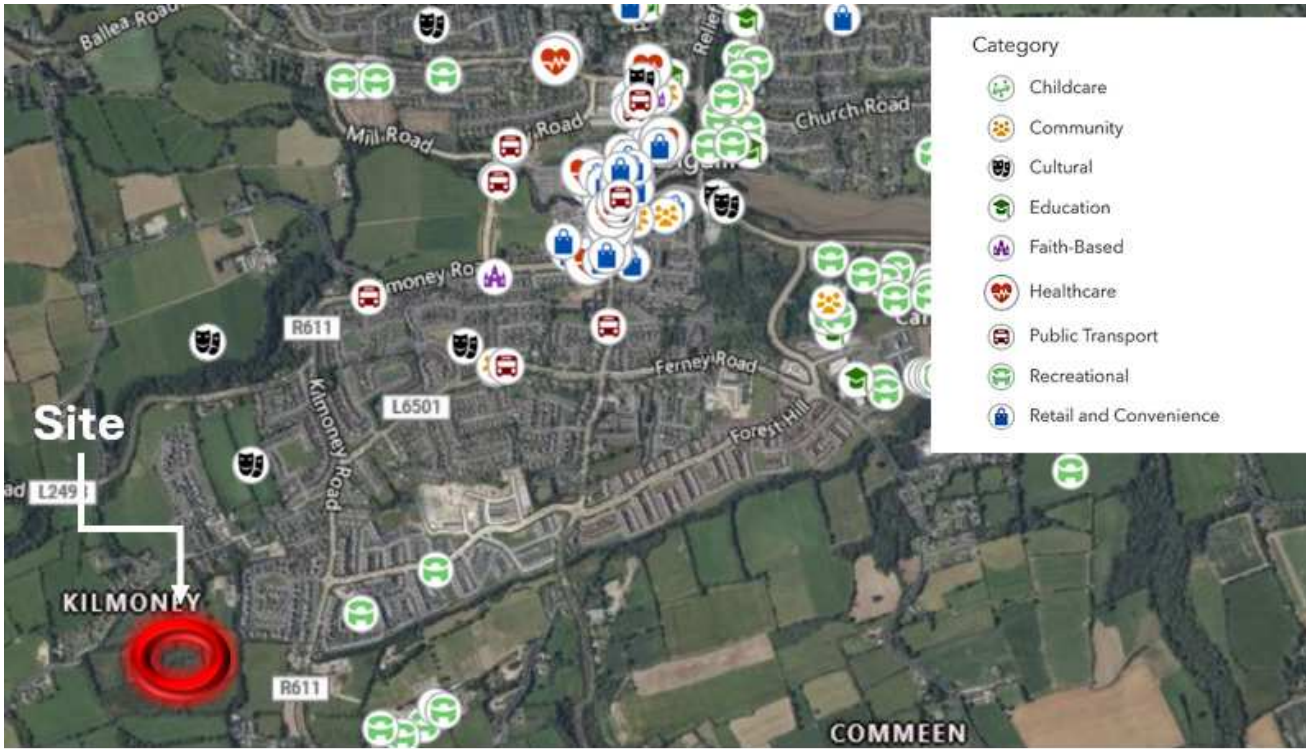


Figure 1.4 Sample of Local Services, Amenities and Social Infrastructure (Source: McCutcheon Halley via ArcGis)

1.2.3 Land Use Zoning Objective

In accordance with the Cork County Development Plan (CDP) 2022-2028, the subject site is primarily zoned CL-R-10 with the following zoning objective;

“Medium B density residential development to include a mix of house types accompanied with appropriate landscaping. Access to the site will be from the R611 and the Mountain Road. Specific arrangements will be made for the provision and construction of the link road (CL-U-07) the southern relief road, amenity walk (CLU-08)”

Parts of the site boundary are zoned as ‘ER -Existing Residential/Mixed Residential and Other Uses’. According to the CDP, the objective for this zoning is

“to conserve and enhance the quality and character of established residential communities and protect their amenities.”

See Figure 1.5, which identifies the site boundary in the context of relevant land use zoning.



Figure 1.5 Land Use Zoning Objectives (Source: Cork County Development Plan, with indicative site boundary overlaid by McCutcheon Halley Planning Consultants).

This residential-led development is consistent with the CL-R-10 zoning objective for the subject lands. The proposed uses comprising residential, creche, community room and café are all permissible uses under this zoning objective.

Works are also proposed along Mountain Road in order to improve vehicular and pedestrian access to the development site. These works are appropriate in the context of the ‘ER - Existing Residential/Mixed Residential and Other Uses’, with works along Mountain Road enhancing road and pedestrian infrastructure both for the development site and for existing residential estates/dwellings along Mountain Road.

1.3 Requirement for EIAR

Environmental Impact Assessment (EIA) requirements derive from EU Directives. Council Directive 2014/52/EU amended Directive 2011/92/EU and is transposed into Irish Law by the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.

The proposed development falls within the class of development types requiring an EIA under Schedule 5 of the Planning and Development Regulations 2001 (as amended). The proposed development is subject to Part 2 of this Schedule which deals with infrastructure projects where EIA is required for:

10. b (iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built up area and 20 hectares elsewhere

(in this paragraph “business district” means a district within a city or town in which the predominant land use is retail or commercial).

The proposed Large-Scale Residential Development (LRD) comprises the construction of 362 no. residential units on a gross site area of 12.97ha. An EIAR is therefore required as the LRD comprises urban development on a site area that exceeds the 10ha threshold in a built up area for a mandatory EIAR.

This EIAR has been prepared in accordance with the aforementioned legislative provisions and the following guidelines, among others, as specified in the various specialist EIAR chapters:

- Department of Housing, Planning and Local Government (DHPLG) (2018). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.
- DHPLG (2017). Circular letter PL 1/2017 – Advice on Administrative Provisions in Advance of Transposition.
- European Commission (EC) (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions.
- EC (2013). Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment.
- EC (2017). Environmental Impact Assessment of Projects. Guidance on Scoping.
- EC (2017). Environmental Impact Assessment of Projects. Guidance on the preparation of Environmental Impact Assessment Report.
- EPA (2015). Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements.
- EPA (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.

1.4 Purpose of Environmental Impact Assessment

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

The 2014 Directive, for the first time, provides a definition of EIA and this is now defined by section 171A of the Planning and Development Act, 2000 (as inserted by Regulation 16 of the 2018 Regulations).

It is defined as a process consisting of:

- a) the preparation of an EIAR by the developer;
- b) the carrying out of consultations with the public, prescribed bodies (and, where relevant, any affected Member States);
- c) the examination by the competent authority of the EIAR, any supplementary information provided, where necessary, by the developer and relevant information received through the consultation process;
- d) the reasoned conclusion of the competent authority on the significant effects of the project on the environment; and
- e) the integration of the competent authority’s reasoned conclusion into any development consent decision.

The definition of EIA thus provides for a clear distinction between the process of environmental impact assessment to be carried out by the competent authority and the preparation by the developer of an EIAR.

Section 2 of the 2000 Act has been amended to define an EIAR as a report of the effects, if any, which proposed development, if carried out, would have on the environment and shall include the information specified in Annex IV of the Environmental Impact Assessment Directive.

1.5 Content of Environmental Impact Assessment Report

The EIAR entails a systematic analysis and assessment of the potential environmental effects of a proposed development on its receiving environment. Article 3(1) of the amended Directive prescribes a range of environmental topics that must be addressed in the EIAR, as follows:

“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) A description of the likely significant effects of the project on the environment;
- b) A description of the features of the project and/or measures envisaged in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment;
- c) A description of the reasonable alternatives studied by the developer, which are relevant to the project and its specific characteristics and an indication of the main reasons for the options chosen, considering the effects of the project on the environment ; and
- d) A non-technical summary; and,
- e) Any additional information specified in Annex IV of the Directive/Schedule 6 to the 2001 Regulations, as amended, relevant to the specific characteristics of the project and to the environmental features likely to be affected.

As is required by Annex IV of the 2014 Directive, this EIAR addresses matters including proposed demolition works, risks to human health, major accidents/disasters, biodiversity, climate change and cumulative effects with other existing and/or approved projects.

1.6 Competency

It is a requirement that the EIAR must be prepared by competent experts. For the preparation of this EIAR, the Applicant engaged McCutcheon Halley Chartered Planning Consultants to direct and coordinate the preparation of the EIAR and a team of qualified specialists were engaged to prepare individual chapters, the consultant firms and lead authors are listed in Table 1.1. Details of competency, qualifications, and experience of the lead author of each discipline is outlined in the individual chapters.

Various environmental specialists were commissioned to complete the specialist chapters of the EIAR, as required by Directive 2014/52/EU on the assessment of the effects of certain public and private projects on the environment:

“Experts involved in the preparation of [EIARs] should be qualified and competent. Sufficient expertise, in the relevant field of the project concerned, is required for the purpose of its examination by the competent authorities in order to ensure that the information provided by the developer is complete and of a high level of quality”.

1.7 Format and Structure of the EIAR

This EIAR is prepared according to the ‘Grouped Format Structure’ as described in the Guidelines on information to be contained in Environmental Impact Statements (EPA, 2022). This means that each topic is considered as a separate section. The advantages of using this format are that it is easy to investigate a single topic and it facilitates easy cross-reference to specialist studies.

The EIAR is sub divided into 3 no. volumes as follows:

- **Volume I** Non-Technical Summary;
- **Volume II** Environmental Impact Assessment Report; and
- **Volume III** Appendices to Environmental Impact Assessment Report.

Volume II is presented as 17 chapters as outlined in Table 1-1.

Table 1-1 EIAR Chapters and Contributors

Chapter	Aspect	Consultant	Lead Consultant
1	Introduction	McCutcheon Halley Planning Consultants	Ciaran Dineen
2	Project Description	McCutcheon Halley Planning Consultants	Ciaran Dineen
3	Alternatives	McCutcheon Halley Planning Consultants	Ciaran Dineen
4	Population & Human Health	McCutcheon Halley Planning Consultants	Ciaran Dineen
5	Landscape & Visual	JBA Consulting	Maria Ines Timoteo
6	Material Assets: Traffic & Transport	MHL & Associates Ltd	Brian Murphy
7	Material Assets: Built Services	OSL Butler Consulting Engineers	David Butler
8	Material Assets: Waste	OSL Butler Consulting Engineers	David Butler
9	Land & Soils	Enviroguide Consulting	Gareth Carroll
10	Water & Hydrology	Enviroguide Consulting	Gareth Carroll
11	Biodiversity	Enviroguide Consulting	Tom Ryan
12	Noise & Vibration	AWN Consulting	Jennifer Harmon
13	Air Quality & Climate	Enviroguide Consulting	Laura Griffin
14	Cultural Heritage – Archaeological & Built Heritage	Lane Purcell Archaeology	Avril Purcell
15	Risk of Major Accidents and Disasters	McCutcheon Halley Planning Consultants	Ciaran Dineen
16	Interactions of the Foregoing	McCutcheon Halley Planning Consultants	Ciaran Dineen
17	Summary of Mitigation Measures	McCutcheon Halley Planning Consultants	Ciaran Dineen

In addition, contributors have had regard to other relevant discipline-specific guidelines, these are noted in individual chapters of the EIAR.

1.8 Scoping

The purpose of scoping is to identify the information to be contained in an EIAR and the methodology to be used in gathering and assessing that information. The scope of this EIAR is informed by the requirements of the Directive 2014/52/EU and the transposing Regulations together with the Guidelines set out above. Applicants are not required to seek a formal scoping opinion.

The scope of individual assessments is informed by discipline specific guidelines and, where this is the case, they are referenced in each chapter.

Scoping requires the consideration of the nature and likely scale of the potential environmental impacts likely to arise from a proposed development or project. It is an iterative process that is ongoing throughout the development of the EIAR. The following topics, which include those stipulated in the amended Directive, have been scoped in for this assessment.

- Population and human health;
- Biodiversity;
- Land, soils, geology and hydrogeology;
- Hydrology;
- Air quality and climate;
- Noise and vibration
- Landscape and visual amenity;
- Cultural heritage, archaeology and architectural heritage;
- Traffic and transportation;
- Waste;
- Services; and
- Interactions between the above-listed topics.

1.9 Scope of Cumulative Effects

Directive 2014/52/EU substituted a new Annex IV into Directive 2011/92/EU. Annex IV of the EIA Directive is to be read in conjunction with article 5(1) and sets out the information to be included in an EIAR. Annex IV was transposed into national law via article 97 of the European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 (the “2018 Regulations”) which substituted a new Schedule 6 into the Planning and Development Regulations 2000, as amended.

The Directive requires that the EIAR describes the cumulation of effects with other existing and/or approved projects.

Cumulative effects may arise from:

- “- The interaction between the various impacts within a single project;
- The interaction between all the differing existing and / or approved projects in the same areas as the proposed project.”¹

In August 2018, the Department of Housing, Planning and Local Government issued Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. The Guidelines summarise “cumulative effects” in the following way at page 40;

“Effects are not to be considered in isolation but cumulatively i.e., when they are added to other effects. A single effect on its own may not be significant in terms of impact on the environment but, when considered together with other effects, may have a significant impact on the environment. Also, a single effect which may, on its own, have a significant effect, may have a reduced and insignificant impact when combined with other effects.

Paragraph 2(e)(i)(V) of Schedule 6 (paragraph 5(e) of Annex IV) provides as follows;

¹ Department of Housing, Planning and Local Government, “Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment” (August 2018), page 40.

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

Accordingly, each chapter of this EIAR assesses the cumulative effect of permitted developments in combination with the proposed development.

Individually, each specialist consultant has reviewed under construction, permitted, and or under consideration development in the local area, and using their expertise they have identified projects relevant to their discipline that may interact to produce a cumulative effect. The detail of the identified projects and plans is set out within each specialist chapter of this EIAR.

The proposed development is located in Kilmoney (townland), Carrigaline Co. Cork. There is one application, currently awaiting a decision from Cork County Council, located to the east of the site, while there are a number of applications located elsewhere in Carrigaline, which have been considered as part of cumulative impacts. The detail of these applications is provided in the table below:

Table 1-2 Projects Considered for Cumulative Impact

	Reference	Development	Decision Details
1.	ABP Ref: ABP 313720	Strategic Housing Development for 224 no. residential units (202 no. apartments and 22 no. townhouses) a creche (184sqm) and 3 no. retail units located at Kilmoney, Kilmoney Road, Carrigaline, Co. Cork.	Granted: 21/10/2024
2.	Cork County Council Ref No. 24/5267	Permission for the completion of 5 no. partially constructed dwelling houses and associated site works (no's 6 ,7 ,8, 9 & 10 as previously granted under planning ref no. 17/4692 & ABP 04.249078) at Abbey Lane, Mountain Road, Kilmoney, Carrigaline, Co. Cork.	Granted: 13/08/2024
3.	Cork County Council Ref No. 24/6418	Permission for the demolition of an existing building and the construction of 39 no. residential units. Vehicular and pedestrian access to the proposed development will be provided via a new entrance from the R611 road at Kilmoney, Carrigaline, Co. Cork. This application is pending a decision from Cork County Council at time of writing with a decision due on 19/02/2025	Submitted: 17/12/2024 Decision Due: 19/02/2025

Cumulative effects are not limited to projects, and it is necessary to also consider relevant Plans. According to the Environment Protection Agency (2020), in Ireland, key cumulative effects – where environmental receptors are at, or near, their thresholds or their capacity to assimilate more change – include climate change; water quality, flood risk, air quality, biodiversity and landscape. For the purpose of this EIAR, the following have been considered in relation to culminative impacts:

- **Cork County Development Plan 2022-2028** - gives spatial expression to the county’s economic, social, housing, and cultural development. The Plan has a key role in protecting the environment, heritage, and amenities of the city and in mitigating against the impacts of climate change. It includes policies and objectives for all of the aspects included in this EIAR.

- **The Climate Action Plan, 2024 (CAP24)** – climate change is the ultimate cumulative effect, nationally and internationally. The Climate Action Plan 2024 (CAP24) is the third annual update to Ireland’s Climate Action Plan. The Plan was approved by the Government on 20 December 2023, subject to Strategic Environmental Assessment and Appropriate Assessment. Thresholds for greenhouse gas emissions are being exceeded. The Plan acknowledges that rapid and significant reductions in greenhouse gas (GHG) emissions are required if we are to meet the 2015 Paris Agreement Goals. The European Green Deal commits to delivering net-zero GHG emissions at EU level by 2050; with Ireland committed to achieving a 51% reduction in emissions from 2021 to 2030, and to achieving net-zero emissions no later than 2050. T
- **National Biodiversity Plan** - The Plan sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland’s ‘Vision for Biodiversity. It has been developed in line with the EU and International Biodiversity strategies and policies.
- **Standards in the EU Air Quality Directive and ‘daughter’ directives** - establish the levels of air pollutants that have no significant impacts on human health or the environment.

Each of the specialist chapters considers the cumulative effects of projects and plans relevant to the project.

1.10 Impact Assessment Methodology

Each chapter of this EIAR assesses the direct, indirect, cumulative, and residual impact of the proposed development for both the construction and operational stage of the proposed development.

The impact assessment methodology is detailed in the respect of the various environmental topics in the respective chapters herein. The assessment of impacts is based on the source-pathway-receptor model, which dictates that, for an environmental impact to occur, there must be a source, a receptor which is sensitive to the effect in question, and a pathway by which the effect can reach the receptor. Unless otherwise stated, the criteria for effect / impact characterisation are as per the EPA guidelines (as set out in Table 1.2). The significance of an impact is determined through comparison of the character of the predicted effect to the sensitivity of the environment / receptor in question.

Table 1-2 Impact Rating Terminology

Quality of Effect	
Positive	A change which improves the quality of the environment (for example, by increasing species diversity, or the improving the reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
Neutral	No effects or effects that are imperceptible, within normal bounds of variation or within the margin of forecasting error.
Negative/Adverse Effects	A change which reduces the quality of the environment (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem; or damaging health or property or by causing nuisance).
Significance of Effect	
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 Effect	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.

Moderate Effect	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
Significant Effect	An effect which, by its character, magnitude, duration, or intensity, alters a sensitive aspect of the environment.
Very Significant Effect	An effect which, by its character, magnitude, duration, or intensity, significantly alters most of a sensitive aspect of the environment.
Profound Effect	An effect which obliterates sensitive characteristics.
Duration of Effects	
Momentary	Effects lasting from seconds to minutes
Brief	Effects lasting less than a day
Temporary	Effects lasting less than a year
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
Frequency	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually).
Extent and Context of Effects	
Extent	Describe the size of the area, the number of sites and the proportion of a population affected by an effect.
Context	Describe whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions (is it the biggest, longest effect ever?).
Probability of Effects	
Likely	The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
Unlikely	The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.
Type of Effects	
Indirect (Secondary or Off-site)	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	The addition of many minor or insignificant effects, including effects of other projects, to create larger, more significant effects.
Do-Nothing	The environment as it would be in the future should the subject project not be carried out.

Worst-Case	The effects arising from a project in the case where mitigation measures substantially fail.
Indeterminable	When the full consequences of a change in the environment cannot be described.
Irreversible	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
Residual	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
Synergistic	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).

1.11 Consultation

A dedicated website for this proposed development is established and the EIAR is available at mountainroadlrd.ie

Additionally, prior to lodging this application, the required information has been issued for the Department of Housing, Planning and Local Government's EIA Portal. The purpose of this tool is to inform the public, in a timely manner, of applications that are accompanied by an EIAR.

An Opinion was received from Cork County Council following the S247 pre-application consultation and LRD Meeting and it contained details of discussions. The project team's response to the Opinion is provided under separate document with the planning application.

- The following prescribed bodies have been consulted in relation to the general scope of the EIAR.
- Department of Housing, Local Government, and Heritage
- Department of Tourism, Culture, Arts, Gaeltacht, Sport & Media
- Department of Education
- Geological Survey Ireland (Department of the Environment, Climate and Communications)
- The Heritage Council
- Office of Public Works (OPW)
- Transport Infrastructure Ireland (TII)
- The National Transport Authority (NTA)
- The Health and Safety Authority (HSA)
- The Health Service Executive (HSE)
- Inland Fisheries Ireland
- Bat Conservation Ireland
- Uisce Éireann
- An Taisce
- Bord Gais
- ESB
- Environmental Protection Agency
- Fáilte Ireland

Responses were received from the following:

- Department of Housing, Local Government, and Heritage
- Geological Survey Ireland (Department of the Environment, Climate and Communications)
- Inland Fisheries Ireland
- Transport Infrastructure Ireland (TII)
- Uisce Éireann

Responses received are presented in Appendix 1.1, along with a copy of the consultation information letter issued to each of the above prescribed bodies.

CHAPTER TWO

PROJECT DESCRIPTION



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER TWO

Table of Contents

Project Description

2.1 Introduction 2-1

2.2 Expertise and Qualifications 2-1

2.3 Proposed Development Site 2-1

2.4 Demolition & Construction Phase..... 2-10

2.5 Health and Safety..... 2-12

2.7 Decommissioning..... 2-12

2.8 Conclusion 2-12

Table of Tables

Table 2-1 Development Overview	2-1
Table 2.2 Car and Bicycle Parking Figures for the site.....	2-7

Table of Figures

Figure 2.1 Indicative Site Location and Surrounding Context	2-1
Figure 2.2 Existing Shed Buildings located along the eastern boundary of the development site.	2-2
Figure 2.3 CGI Image of Proposed Creche (Source: Modelworks)	2-3
Figure 2.4 Proposed Site Layout (Source: Deady Gahan)	2-4
Figure 2.5 CGI Image of Character Area 1 Typologies and Materials (Source: Deady Gahan Architects).....	2-4
Figure 2.6 CGI Image of Character Area 2 Typologies and Materials (Source: Deady Gahan Architects).....	2-5
Figure 2.7 CGI Image of Character Area 4 Typologies and Materials (Source: Deady Gahan Architects).....	2-5
Figure 2.8 CGI Image of Character Area 4 Typologies and Materials (Source: Deady Gahan Architects).....	2-6
Figure 2.9 Primary Pedestrian/Cycle Routes proposed with potential future connections to the east (Source: Deady Gahan Architects).	2-6
Figure 2.10 Woodland Park Illustrative Plan (Source: SRLA)	2-7
Figure 2.11 Activity spaces located throughout the site (Source: SRLA)	2-8
Figure 2.12 Private and Public Amenity Spaces (Source: Deady Gahan Architects).....	2-8
Figure 2.13 Proposed Boundary Treatment Proposals (Source: SRLA)	2-9

CHAPTER TWO | Project Description

2.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) sets out the proposed development and provides details in relation to the demolition, construction and operational phases of the scheme. The chapter was prepared in conjunction with the relevant member of the Design Team, and it should be read in conjunction with the submitted drawings together with supporting reports.

2.2 Expertise and Qualifications

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master’s in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 2 years’ experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR’s, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, single ‘one – off’ developments, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

2.3 Proposed Development Site

The site, which is 12.97 hectares in area, with a net developable area of 10.24 hectares, is located along Mountain Road, in the townland of Kilmoney, Carrigaline, Co. Cork.

The site is situated the south-west of Carrigaline, is within the settlement boundary of the town, and is located c. 2km from the Main Street.

The area surrounding the lands comprise a mix of uses but are mostly residential and agricultural in character. There are a number of individual one-off dwelling houses located along Mountain Road, on both sides of the carriageway. To the south and west of the site are greenfield, agricultural lands, while to the east of the site is an existing farmyard. To the east of the southern portion of the proposed development is the existing Wheatfields residential estate, which consists of mostly two-storey large, detached dwelling units



Figure 2.1 Indicative Site Location and Surrounding Context

The subject land is predominantly a greenfield site which has features and characteristics which will help create a positive living environment by retaining the natural assets and ecological features contained within its parkland setting. There are a number of natural hedgerow boundaries on each side of the site, with an overgrown area located in the centre of the site which provides an opportunity to create a natural and central amenity area. Along the eastern boundary of the site there are agricultural sheds, which are proposed for removal to facilitate the construction of residential units.

An overview of the key development statistics is set out in the following Table:

Table 2-1 Development Overview

Development Statistics	
Gross Site Area	12.97 ha
Net Site Area	10.24 ha
No. Units	362
Public Open Space	16.3%
Non-Residential Uses	1059.9sqm
Density (Net Area)	35.4 dph
Unit Mix Summary	161 no. 2-bed units
	155 no. 3-bed units
	46 no. 4-bed units
Car Parking	584 no. spaces

Development Statistics	
Bicycle Parking	102 no. spaces
Dual Aspect Units	100%
Plot Ratio (Gross Site Area)	0.296
Plot Ratio (Net Site Area)	0.375
Site Coverage (Gross Site Area)	17.7%
Site Coverage (Net Site Area)	22.2%

2.3.1 Existing Structures

As noted above, a portion of the site had previously been operated as a farmyard, where there are existing agricultural sheds. These sheds are located along the eastern boundary of the site, and to the south of the existing farmhouse dwelling, which is to remain in situ. It is proposed that these existing agricultural sheds be demolished as part of the proposed development. The location of these sheds is shown in Figure 2.2, while floor plans and elevations of the sheds, prepared by OSL Consulting Engineers are provided under separate cover with the application material.



Figure 2.2 Existing Shed Buildings located along the eastern boundary of the development site.

2.3.2 Proposed Development

The proposed development consists of the following:

Bridgewater Homes Ltd. intend to apply for permission for the following Large Scale Residential Development (LRD) comprising the demolition of existing structures on site and the construction of 362 no. residential units to include 318 no. dwelling houses (comprising a mix of 2, 3 and 4 bed semi-detached and townhouse/terraced units) and 44 no. 2 bed apartment/duplex units, 1 no. creche with a community room and café and all associated ancillary development works including vehicular and pedestrian access, a 3m shared surface pedestrian and cycle link on the existing laneway to the east, upgrades to the L-6945-9 and L -6495-0 Mountain Road to the north and east of the site to include pedestrian crossings, traffic calming/raised tables and a 3m shared cycle/footpath facility connecting on to the R611/Kilmoney Road, drainage (including a pumping station), landscaping, amenity and open space/play areas, footpaths and cycle lanes, boundary treatments, bicycle and car parking, bin and bike storage, plant, public lighting and all other ancillary development at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

An Environmental Impact Assessment Report (EIAR) has been submitted to the planning authority with the application. The Environmental Impact Assessment Report 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 Local Authority.

The application may be inspected online at the following website set up by the applicant:mountainroadlrd.ie

2.3.3 Non-Residential Uses

As part of the proposed development, it is proposed that uses, in addition to that of residential will be provided. As per the proposed development description provided in Section 2.3.2, the proposal includes the provision of 1 no. childcare facility, 1 no. community room and 1 no. café. These facilities will be provided as part of a neighbourhood centre and the composition of these uses is as follows;

- Childcare Facility – 872.4 sqm (Gross Area)
- Community Room – 83.9sqm (Gross Area)
- Café Unit – 103.6sqm (Gross Internal Area)



Figure 2.3 CGI Image of Proposed Creche (Source: Modelworks)

2.3.4 Housing Mix and Type

The proposed development includes the construction of 362 no. residential units which comprise a mix of the following household sizes;

- 46 no. 4-bedroom units
- 161 no. 3-bedroom units
- 155 no. 2 bedroom units

Of the 362 no. units to be provided, the units listed above represent the following household types;

- 112 no. semi-detached units
- 206 no. townhouse units
- 44 no. apartment units

The varied household size and household type proposed represents a concerted effort to provide a wide range of choice for prospective residents, with the diverse size and types of units proposed capable of accommodating a range of needs, backgrounds and situations which can cater to the current demands of the housing market.

2.3.5 Design Approach and Layout

The design of the proposed scheme has been informed by the relevant planning policy documents at national and local levels, including in particular The Sustainable Residential Development and Compact Settlements Guidelines for Planning Authorities, the Urban Design Manual – A Best Practice Guide and the Design Manual for Urban Roads and Streets at a national level, and the 2022 Cork County Development Plan at a Local Planning Policy level. The proposed site layout

designed Deady Gahan Architects proposes a density of 35.4 no. units per hectare, which is considered suitable for the subject site and consistent with national policy which seeks higher densities on residential sites. The proposed density is also compliant with the objectives outlined for the site in the 2022 Cork County Development Plan.

The proposed development has been designed to provide high quality residential units with a wide range of different house and apartment types which ensures a housing mix that caters for a range of needs and backgrounds. The proposed layout focuses on the creation of distinctive streetscapes to create a warm and engaging environment which assists the overall placemaking vision.

It is considered that the careful integration of design, connectivity, landscaping and ecology on the site has led to the creation of a quality housing proposal which provides for a range of housing demands in Cork County's largest town.

The design of the dwellings responds to the local vernacular within Carrigaline. The proposed dwellings incorporate a mix of materials and features that are sympathetic to the local setting. Furthermore, the external finishes of the dwellings will make a positive contribution to the locality.

The layout has been informed by the site's existing ecological features, which includes existing trees and hedgerows. In particular, the layout of the site has been defined by the central woodland area located in the heart of the site. It is proposed that this natural woodland area can be protected and enhanced so that it will form part of an active open space which can provide a significant amenity value for future residents. It is envisaged that this area can be home to an active environment, which promotes health and well-being, and will incorporate unique features such as a woodland play area, a green amphitheatre, a kick-about lawn and an exercise station area.

The proposed layout has been designed to function as a sustainable and successful residential neighbourhood drawing on the established pattern of the surrounding development. The proposal provides for 362 no. units that face towards the primary areas of open space and shared space zones. It also provides in-curtilage parking spaces, on-street parking spaces, on-street motorcycle parking, as well as bicycle parking space. Access to the site is proposed from the Mountain Road to the north of the site. The scheme will provide a pleasant environment for individuals and families to live and will have good links to the town of Carrigaline. The site is within easy walking distance to civic facilities.

The open space and shared space areas are situated in areas which are highly visible and benefits from passive surveillance from the surrounding dwellings, promoting a sense of safety and minimising the potential for anti-social behaviour. The orientation of the dwellings around the open space areas negates the opportunity for overlooking and privacy issues between dwellings as building elevations do not directly face onto each other. The location of the open space and shared space areas also ensures accessibility and acts as an extension to the individual gardens and will aid in fostering a sense of ownership and community for future residents. The open space and shared space areas will be accessible from all dwellings via the footpath network throughout the site.

The internal road layout is designed to control traffic speeds through the use of cul-de-sacs as well as subtle changes of alignment. These measures will act to slow vehicular traffic by decreasing the driver's perception of acceptable speeds and encourages the use of the roadway as a shared space for play. The layout is designed to provide a safe and secure arrangement of movement for the future residents.



Figure 2.4 Proposed Site Layout (Source: Deady Gahan)

2.3.6 Materiality

The materiality of the buildings will provide opportunity to create an unmistakable identity for a distinctive character in different areas within the new neighbourhood. The location of materials on the respective units is subject to their durability and visual aesthetic qualities. The development is structured to enable the creation of neighbourhoods featuring distinct architectural languages. Each of these character areas are grouped around a central space creating a recognisable sense of place by using a mix of landmark housing typologies and blend of materials unique to that location.

Character Area 1 is located at the entrance of the proposed development. The typology group will be of the form of 2 storey semi-detached and townhouse units with some units overlooking various open spaces and fronting the existing scrubland. Red and off-white brick are the predominant materials proposed for this character area. This facilitates low maintenance and a high quality finish.



Figure 2.5 CGI Image of Character Area 1 Typologies and Materials (Source: Deady Gahan Architects)

Character Area 2 is located towards the entrance of the development. This typology group will be of the form of 2-storey own-door apartment units, semi-detached and townhouse units. Particular consideration has been given to providing various elements of scale throughout this character area. Materials for these units consist of an off-white render, beige brick with olive green window frames.



Figure 2.6 CGI Image of Character Area 2 Typologies and Materials (Source: Deady Gahan Architects)

Character Area 3 is located towards the southern part of the site. A wide range of typologies are provided throughout the site to cater for the needs of future residents with varying lifestyles. This character area is in close proximity to the proposed crèche and benefits from mature trees and hedgerows. These are a valuable amenity which will add to the future residents quality of life. Beige brick and off-white render are the predominant materials proposed for this character area. The contrasting materials and unique elevational treatment creates a distinct community within the overall scheme.



Figure 2.7 CGI Image of Character Area 4 Typologies and Materials (Source: Deady Gahan Architects)

Character Area 4 is located towards the western part of the site and consists of 2/3-storey duplex apartments, semi-detached and townhouse units. The external materials chosen are grey brick and off-white render with distinctive flushed eaves creating a modern aesthetic that facilitates low maintenance and a high quality finish.



Figure 2.8 CGI Image of Character Area 4 Typologies and Materials (Source: Deady Gahan Architects)

Please refer to the Architectural Design Statement prepared by Deady Gahan Architects which accompanies the planning application for further detail in this regard.

2.3.7 Access, Parking & Connections

It is proposed that the site will be accessed from Mountain Road along the northern boundary of the site. The existing Mountain Road is to be upgraded from the site entrance with works proposed along the east of the road. An agreement has been reached with the relevant stakeholders along this section of the road, with works facilitating upgrades, resulting in the carriageway width being increased and a footpath proposed on the northern side, where paths will link to the development and the existing footpath network to the east.

The proposed development and the layout will include possible future greenway connections as well as retaining the existing public/private access off Mountain Road, along the east boundary of the site, potentially providing a pedestrian link here.

Within the scheme a hierarchical road network of streets and home zone areas have been designed in accordance with the principles of the Design Manual for Urban Roads and Streets (DMURS).

The proposal provides connectivity for pedestrians, cyclists and vehicles with footpaths being provided throughout the site. Pedestrian connections are provided between the areas of the site which will ensure residents will have good access

to all open space areas within the development. These internal connections are highly overlooked. It is proposed that a landscaped pedestrian and cyclist amenity walk be provided from the northern entrance of the site to the eastern boundary.

The design strategy also includes a street hierarchy, as proposed by Deady Gahan Architects. The primary access is from Mountain Road with secondary local streets branching off this primary route throughout the site and provision for pedestrian, cycle and vehicular connectivity to the adjoining CL-R-07 site to the southeast. Shared surfaces are incorporated off secondary streets, helping to create a sense of place and community throughout the scheme, while also acting as a safety measure, giving pedestrian priority.

This infrastructure will promote permeability through the proposed development and within the wider area, encouraging walking and cycling in the locality and minimising the need to use private vehicles, particularly for shorter journeys.



Figure 2.9 Primary Pedestrian/Cycle Routes proposed with potential future connections to the east (Source: Deady Gahan Architects).

The proposed development provides in-curtilage parking spaces, on-street parking spaces, on-street motorcycle parking, as well as bicycle parking spaces. A total of 584 no. car parking spaces are to be provided. 563 no. spaces will be allocated spaces. 9 no. visitor spaces are to be provided while 12 no. spaces are provided for the childcare facility, café and community room combined. All in-curtilage spaces will be equipped with necessary infrastructure and ducting for charging points. In addition to this, 10 no. EV parking spaces will be provided within the scheme. A total of 9 no. motorcycle spaces are to be provided.

With regards to the provision of bicycle spaces, all houses and ground floor apartments that have direct access to rear gardens and private amenity spaces can utilise these areas for bicycle storage. Each mid-terrace house will have an in-curtilage bike store to the front of the units, with apartments / duplexes at first floor levels being allocated spaces in nearby communal bike stores. Spaces have been provided at 1 no. space per bedroom with 0.5 no. space visitor per unit. In total 48 no. private bike storage spaces are to be provided, 22 no. spaces for the cafe and creche and 12 no. visitor spaces. Please refer to Table 2.2 below.

Table 2.2 Car and Bicycle Parking Figures for the site

	Car Parking Spaces	Cycle Parking Spaces
Total Parking Spaces	584	102
Total Communal Electrical Vehicle Parking Spaces	10	NA
Visitor Parking	9	12
Childcare Facility	8	12
Community Room/Café	4	12
Total Parking	584 no.	102 no.

2.3.8 Landscape

2.3.8.1 Public Open Space

Public open space reflects 16.3% of the overall site area, with active spaces provided throughout the site. These present amenity opportunities for prospective residents of all ages.

A key focus of the layout is shaped around a central woodland area in the heart of the site. It is proposed that this natural woodland area can be protected and enhanced so that it will form part of an active open space which can provide a significant amenity value for future residents. It is envisaged that this area can be home to an active environment, which promotes health and well-being, and will incorporate unique features such as a woodland play area, exercise stations and seating areas.



Figure 2.10 Woodland Park Illustrative Plan (Source: SRLA)

In addition to the central woodland open space area, additional play areas are provided throughout the site, ensuring that each character area has access to these active and green spaces on their doorstep. Kick-about lawn areas, exercise stations, and dedicated play areas are some of the features which will help to make the overall site one that promotes activity and play.



Figure 2.11 Activity spaces located throughout the site (Source: SRLA)

2.3.8.2 Private Amenity Space

Each unit has access to private amenity spaces such as a garden for the houses and a balcony or a small garden for the apartments. All homes will be constructed to prevent acoustic transfer and have been sited to prevent overlooking into adjacent private gardens. Houses have a private back garden and are placed back to back with a distance greater than 16m to guarantee privacy. These spaces have all been designed in accordance with the relevant guidelines and requirements.



Figure 2.12 Private and Public Amenity Spaces (Source: Deady Gahan Architects)

2.3.8.3 Boundary Treatment

A boundary treatment plan has been developed by Simon Ronan Landscape Architects and is provided under separate cover as part of the application material. Significant efforts have been made to retain existing hedgerows and ecological corridors throughout the site. The design works to protect and celebrate these as part of its character. Furthermore, the design is enhanced with additional tree planting to all boundaries and its internal space, creating a variety of spatial experiences.

Boundary treatment agreements have been reached with relevant stakeholders along Mountain Road as part of the proposed works.

Please refer to the submitted application material by SRLA for further details.



Figure 2.13 Proposed Boundary Treatment Proposals (Source: SRLA)

2.3.9 Drainage

A full description of services associated with the proposed development is contained in Chapter 7 of this EIAR and it should be read in conjunction with this section.

2.3.9.1 Wastewater

It is proposed that this development will be serviced internally by 150mm and 225mm diameter foul sewers and will include the provision of services connections, inspection chambers etc. throughout the site. Due to the topography of the site, a portion of the site will require pumping.

As part of the Uisce Éireann confirmation of feasibility received under CDS24001434, an upgrade is required to the existing foul sewer network to accommodate the proposed site. The aforementioned upgrade works includes a 300mm diameter foul sewer to be installed from the proposed development and connecting to the existing foul sewer in the R611 (Kilmoney Lower Road).

We have also received a Statement of Design Acceptance with respect to site specific design information.

Foul sewers have been designed and will be constructed in accordance with the Uisce Éireann ‘Standard Details for Wastewater infrastructure’ and ‘Code of Practice for Wastewater Infrastructure’. In addition, foul sewers have been designed to the Building Regulations 1997, as amended, (referred to within as ‘the Building Regulations’) and specifically in accordance with the principles and methods set out in EN 752:2008 and DOE ‘Recommendations for Site Development Works’ (1998). In addition, HR Wallingford ‘Tables for the Hydraulic Design of Pipes, Sewers and Channels’ and Water UK/ WRc ‘Sewers for Adoption – 6th Edition’ have been applied.

2.3.9.2 Surface Water

It is proposed to service the proposed development by means of a connection to an existing 300mm diameter surface water pipe located to the north of the site. This surface water pipe crosses Mountain Road, and eventually discharges into an existing stream running along Forest Road.

The proposed development has been sub-divided into 10 smaller sub-catchments. These sub-catchments attenuate and control the discharge generated within to QBAR. Surface water run-off from the proposed development will be discharged, after attenuation and control, to QBAR.

The site’s surface water management infrastructure has been designed in accordance with the Greater Dublin Strategic Drainage Study 2005 (GSDSDS).

Proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study 2005 (GSDSDS), Greater Dublin Regional Code of Practice (V6), the Department of the Environment’s “Recommendations for Site Development Works for Housing Areas” (1998), the Department of the Environment’s Building Regulations “Technical Guidance Document Part H Drainage and Waste Water Disposal” and BS EN 752: 2008 “Drain and Sewer Systems Outside Buildings”.

2.3.9.3 Sustainable Urban Drainage Systems (SuDS)

It is proposed to use a Sustainable Urban Drainage System (SuDS) approach to stormwater management throughout the site where possible. The overall strategy aims to provide an effective system to mitigate the adverse effects of urban stormwater runoff on the environment by reducing runoff rates, volumes and frequency, reducing pollutant concentrations in stormwater, contributing to amenity, aesthetics and biodiversity enhancement and allow for the maximum collection of rainwater for re-use where possible. In addition, SuDS features aim to replicate the natural characteristics of rainfall runoff for any site by providing control of run-off at source and this has been achieved by the current proposals.

A number of SuDS features are proposed as part of this development and include;

- Permeable Pavers
- Rainwater Harvesting
- Infiltration Basins
- Tree Pits
- Swales
- Rain Gardens

A full list of SuDS features are available in the Surface Water Management Plan/ Drainage Impact Assessment prepared by OSL Consulting Engineers under separate cover.

The proposed surface water drainage design has been discussed in more detail within the Engineering Report submitted as part of this application, under separate cover by OSL Consulting Engineers.

2.3.9.4 Water Supply

It is proposed that this development will be serviced by 150mm and 100mm diameter watermains and will include the provision of new fire hydrants and relevant infrastructure throughout the site.

As part of the UE confirmation of feasibility received under CDS24001434, an upgrade is required to the existing water network to accommodate the proposed site. The aforementioned upgrade works includes a 150mm diameter water main to be installed from the proposed development and connecting to the existing water main in the R611 (Kilmoney Lower Road).

All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Uisce Éireann 'Standard Details for Water Infrastructure' and 'Code of Practice for Water Infrastructure' and the Department of the Environment's Building Regulations "Technical Guidance Document B - Fire Safety (2020)".

2.3.10 Services

2.3.10.1 Electrical Supply and Telecommunications

In order to facilitate the new development the proposal is to install new electrical services to serve the houses and apartments. This involves the following:

- Rerouting the overhead lines underground.
- New Unit Substations.
- New underground ducting and electrical infrastructure to serve the development.
- New underground ducting and electrical infrastructure to serve the development lighting.

In order to facilitate the new development, the proposal is to install new underground ducting and telecommunications infrastructure to serve the houses and apartments.

2.3.10.2 Gas Supply

It is not proposed that gas is provided to the houses and apartments in the development.

2.3.10.3 Waste Management

An Operational Waste Management Plan (OWMP) prepared by OSL Consulting Engineers accompanies this application and should be referred to in conjunction with this section.

2.3.10.4 Climate Action and Energy

A Climate Action and Energy Statement has been prepared by OSL Consulting Engineers and is provided under separate cover with the application material.

2.3.10.5 Site Lighting

A public lighting strategy has been developed by Molloy Consulting and is provided under separate cover as part of the application material.

2.4 Demolition & Construction Phase

This application is accompanied by an Outline Construction Environmental Management Plan (OCEMP) and a set of demolition plan drawings as part of the application material. The Report and drawings should be read in conjunction with this chapter for a comprehensive description of the construction and demolition phase.

2.4.1 Programme

It is proposed, upon receiving a successful application, that there will be possible number of phases of construction. The dwelling units will be developed on a sequential basis starting on the western part of the site and generally moving sequentially. It's proposed to commence work on site in January 2026 starting with the site set up followed by the setting out and provision of services. Full phasing details are available in the OCEMP.

Phase 1a consists of the Site Set Up. This task will take up to six weeks to complete with approximately up to 4-8 staff employed. It will involve site clearance (given the lack of existing scrub/vegetation this will not be significant), set up of a site office, compound, secure the construction site and erection of signage for site security & safety purposes. The provision of temp foul and storm sewers will be provided for in the site office location and can connect directly in the existing foul network.

Phase 1b consists of the laying of sewers mainly within the site, the provision of footpaths, lighting and roadways. Given the degree of work involved in the provision of storm & foul services this stage will involve significant work and is estimated to take between 36 months with 8-50 staff employed.

Phase 2 consists of the construction of residential units. The construction of the residential units will, to a certain degree respond to the demand/sale of the units involved, it is estimated to be constructed/completed over a 60 month period. It will involve up to 100 No. construction staff (depending on the number of units being constructed at any one time).

2.4.2 Site Compound

Details of the site compound are provided under separate cover in the OCEMP, submitted with the application material. The compound shall be entirely within the site boundaries. Site accommodation to be provided will include suitable washing / dry room facilities for construction staff, canteen, sanitary facilities, first aid room, office accommodation etc.

Access to the compound will be security controlled and all site visitors will be required to sign in on arrival and sign out on departure. The compound shall be constructed using a clean permeable stone finish and will be enclosed with security fencing. A permeable hardstand area will be provided for staff parking and these areas will be separate from designated machinery/plant parking. Appropriate on-site parking and compounding will be provided to prevent overflow onto the local network. Parking in nearby residential estates shall be strictly prohibited

On completion of the works all construction materials, debris, temporary hardstands etc. from the site compound will be removed off site and sent for reuse as by-products or recovery at authorised facilities and the site compound area reinstated in full on completion of the works.

Refer to OSL Butler Proposed Construction Access drawing 24011-OSL-XX-10-XX-DR-C-1010 included as part of this planning application material for further information regarding the site compound.

2.4.3 Construction Hours

For the duration of the proposed works the maximum working hours shall be 07:00 to 18:00 Monday to Friday (excluding bank holidays) and 08:00 to 16:00 Saturdays, subject to the restrictions imposed by the planning authority. No working will be allowed on Sundays and Public Holidays.

2.4.4 Construction Traffic

AN Outline Construction Traffic Management Plan (OCTMP) prepared by MHL Consulting Engineers accompanies this application under separate cover and should be read in conjunction with this section.

This Outline Construction Traffic Management Plan (CTMP) is a preliminary planning stage document that outlines strategies and measures to effectively manage, and control traffic associated with construction activities. It outlines traffic management planning items such as the transportation and movement of vehicles, equipment, and personnel during the construction phase of a project. The CTMP includes details about traffic routes, access points, parking arrangements, and measures to minimize the impact on local roads and communities. The aim is to ensure the safe and efficient flow of traffic, reduce disruptions to the surrounding area, and mitigate potential risks associated with construction-related transportation.

Access is to be maintained at all times to leaseholds, private residents, and general local and public roads traffic. Arrival and egress of large HGVs to the site will require these vehicles to enter the site along the adjoining Mountain Road, avoiding the nearby residential estates to the north. The existing farm site entrance will be used for all construction access /deliveries to the site but will be upgraded/enhanced to facilitate all future construction and operational access requirements. This may require its signalisation at an early stage, subject to approval by the local authority.

Traffic management, including a stop/go system, during peak HGV movements is to be implemented. Off-loading of materials such as concrete, precast concrete, structural steel, etc. is proposed alongside site construction traffic movements, mobile cranes, concrete pumping etc. During deliveries, the main internal access road will be 2-way and require the proposed development access be managed, particularly in the vicinity of the existing inhabited private residencies, pedestrian crossings, footpaths and within tight radius bends nearby on the public road.

The internal layout of the site to the various storage areas will have to be considered and carefully planned. This constraint will require that internal traffic management, particularly of large construction vehicles will have to be carefully managed within the site. The proposed site compound shall be located within the site boundary and positioned to ensure that deliveries, staff parking and visiting vehicles do not wait on the public road before entering the site as far as is practicable. The site set-up shall allow for adequate parking for all site staff within the confines of the proposed site boundary. No site vehicles will be permitted to park along the public roads or outside the working site boundary. The Main Contractor will provide a suitable secure area for all site personnel vehicles for the duration of the works.

2.4.5 Demolition Phase

The proposed development includes the removal of a small number of agricultural farm sheds which are located along the eastern boundary of the site. The Applicant will oversee the Demolition process and will provide a suitably competent and experienced representative as Construction & Demolition (C&D) Waste Manager for the project.

Demolition waste shall be generated during development but will be limited. Details of demolition waste to be generated from the development are outlined in the OCEMP.

2.4.6 Earthworks

2.4.6.1 Ground Conditions

A Site Investigation Report has been submitted as part of Appendix 9.1. The soils and geology encountered during the site investigation undertaken by PGL in 2018 are summarised as follows;

- Topsoil was encountered from ground level to depths ranging from 0.25mbGL to 0.40mbGL.
- The topsoil was underlain by mixed glacial deposits comprising slightly sandy, slightly gravelly SILT with low cobble content to depths of up to 3.6mbGL.
- Weathered mudstone was encountered in the southeast of the site at depths ranging from 2.7mbGL to 3.3mbGL.
- Groundwater was encountered at 2.7mbGL (described as a trickle flow rate) at the boundary between the mixed glacial deposits and the weathered Mudstone, at a single trial pit location. Groundwater is assessed in Chapter 10 of this EIAR.

According to the Resource and Waste Management Plan submitted under separate cover, there will be bulk excavation cut and fill required throughout the site in order to facilitate the finished levels of the developed site. Cut and fill depths will generally be limited to less than 2m with the exception of certain specific parts of the site where substantially deeper excavation depths will be required.

Existing topsoil and subsoil onsite are uncontaminated and naturally occurring and thus, is in accordance with the regulatory regime for by-products as enshrined in Article 5 of the Waste Framework Directive and as transposed into Irish legislation by Article 27 of the European Communities (Waste Directive) Regulations 2011 and are considered suitable for re-use in the proposed development.

Excavated topsoil and subsoils required for re-use on site will be temporarily stored on site for re-use, otherwise it will be exported. Rock excavated on site will be crushed and re-used on site for filling where suited. Topsoil will be stored in an appropriate manner on site for the duration of the construction works.

2.4.6.2 Invasive Species

There are no recorded invasive species on the site. Please refer to Chapter 11 of this EIAR for further details.

2.4.6.3 Waste

A Resource and Waste Management Plan (RWMP) has been prepared for construction phase of the proposed development and is submitted under separate cover with the planning application and should be read in conjunction with this section.

The waste management objective will be to prevent waste arising in the first place, and to re-use, recycle or recover waste materials where possible. The Contractor will have the responsibility to record resource and waste management at the site in line with the Resource and Waste Management Plan (RWMP).

2.4.6.4 Bulk Excavation

According to the OCEMP, a specialist ground works contractor will be appointed to carry out the excavation and rock breaking works. The appointed specialist contractor will carry out a full risk assessment prior to the commencement of work.

The ground works operation will be carried out in order to ensure that material removed from the ground is taken away at regular intervals in order to reduce the amount of material that can be stored on site.

Topsoil stripping associated with the proposed development will be monitored by a suitably qualified archaeologist, which will ensure the identification of any small archaeological features that may survive within the site. If any features of archaeological potential are discovered during the course of the works further archaeological mitigation will be required, such as preservation in-situ or by record.

Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Topsoil stockpiles will also be located so as not to necessitate double handling.

2.5 Health and Safety

2.5.1 Construction Phase

A detailed Construction and Environmental Management Plan (CEMP), in line with the preliminary CEMP submitted as part of this planning application, will be prepared and implemented by the contractor at the construction phase.

Works shall be performed in accordance with Statutory requirements, including Health, Safety and Welfare at Work (Construction) Regulations 2013 (S.I. no. 291 of 2013). The general principles outlined in the Health and Safety Authority document: 'Code of Practice for Avoiding Danger from Underground Services' will be followed to ensure the safety of workers and to minimise the risk of damage to any existing pipelines or buildings.

2.6 Commissioning

The testing and commissioning of services (drainage, watermain, gas, electricity) will be completed in accordance with relevant codes of practice as set out in Chapter 7 of the EIAR.

2.7 Decommissioning

The design life of the scheme is greater than 60 years. Thus, for the EIA process, the development is considered permanent, and a decommissioning phase is not considered in this report.

2.8 Conclusion

This chapter sets out the development parameters for the proposed development including an overview of the Architectural, Landscape and Engineering strategy. An overview of the phasing for construction has also been provided, and further information can be found in the Outline Construction and Environmental Management Plan and Outline Construction Traffic Management Plan submitted under separate cover.

CHAPTER THREE

ALTERNATIVES



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER THREE

Table of Contents

Alternatives

3.1 Introduction 3-1

3.2 Expertise and Qualifications 3-1

3.3 Consideration of Alternatives 3-1

3.4 Difficulties Encountered..... 3-7

3.5 Conclusion 3-7

Table of Tables

Table 3.1 Key Site Statistics – Alternative Design 1.....3-3

Table 3.2 Key Site Statistics – Alternative Design 2.....3-4

Table 3.3 Key Site Statistics – Alternative Design 3.....3-4

Table 3.4 Key Site Statistics – Alternative Design 4.....3-5

Table 3.5 Key Site Statistics – Final Design – Submitted Scheme 3-6

Table of Figures

Figure 3.1 Alternative Design No. 1 (Source: Deady Gahan Architects) 3-3

Figure 3.2 Alternative Design No. 2 (Source: Deady Gahan Architects) 3-4

Figure 3.3 Alternative Design No. 3 (Source: Deady Gahan Architects) 3-5

Figure 3.4 Alternative Design No. 4 (Source: Deady Gahan Architects) 3-6

Figure 3.5 Final Design of Submitted Scheme (Source: Deady Gahan Architects)..... 3-7

CHAPTER THREE | Alternatives

3.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) was prepared to consider alternatives as required by Annex IV (2) of the Environmental Impact Assessment (EIA) Directive 201/92/EU on the assessment of the effects of certain public and private projects on the environment as amended by EIA Directive 2014/52/EU (the “EIA Directive”) and in Schedule 6 of the Planning and Development Regulations 2001, as amended, (PDRs) which states;

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

The PDRs identify that reasonable alternatives may include project design proposals, location, size and scale, which are relevant to the proposed development and its specific characteristics. The PDRs require that an indication of the main reasons for selecting the preferred option, including a comparison of the environmental effects be presented in the EIAR.

The Environmental Protection Agency Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, 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 Guidelines also state that the range of alternatives considered may include the ‘do-nothing’ alternative.

Notwithstanding the above, pursuant to Section 3.4.1 of the 2022 EPA Guidelines, 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’...” (emp. added)

The Guidelines are also instructive in stating:

“Analysis of high-level or sectoral strategic alternatives cannot reasonably be expected within a project level EIAR... It should be borne in mind that the amended Directive refers to ‘reasonable alternatives... which are relevant to the proposed project and its specific characteristics’”.

This chapter of the EIAR provides an outline of the main alternatives examined for the proposed development and sets out the main reasons for choosing the development as proposed.

The assessment of alternatives is considered under the following headings:

- i. ‘Do-nothing’ Alternative
- ii. Alternative Locations

- iii. Alternative Uses
- iv. Alternative Project Design
- v. Alternative Processes

3.2 Expertise and Qualifications

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master’s in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 2 years’ experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR’s, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, single ‘one – off’ developments, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

3.3 Consideration of Alternatives

3.3.1 Do Nothing

3.3.1.1 Actual Do Nothing

The ‘Do-nothing’ alternative is a general description of the evolution of the key environmental factors of the site and environs if the proposed project did not proceed. Each Chapter of this EIAR includes a description of the ‘Do Nothing’ alternative and should be referenced in conjunction with this Chapter.

The development site has been zoned for new residential development by the Cork County Development Plan, with a specific zoning objective (CL-R-10). It is a greenfield parcel of land situated in an area where there has been residential development to the north and to the east. The site has access to infrastructure and services, while Carrigaline town centre is looking a short walking distance to the north of the site. The site will connect into existing footpath networks through the provision of a proposed shared surface footpath along Mountain Road, as proposed as part of this development. The proposal also makes provision for future access to lands to the east of the site, which is to enable future pedestrian and cyclist connectivity to the R611, supporting objective CLU-08 of the Development Plan.

The applicant has secured the consent of a number of individual third party landowners in order to facilitate the proposed development.

The proposed development site would remain in its current condition, and it would not fulfil its residential zoning objective nor assist in the delivery of housing units at a period of national housing shortage. Accordingly, there would be an adverse effect on population, as this approach would fail to address the shortage of homes in Cork County. Maximising the efficiency of zoned land particularly when nationally, there is a housing crisis and as a result, the delivery of housing on zoned land in a timely manner is of critical importance.

When compared with the proposed development, the key difference between the Do-Nothing and the proposed development is the delivery of new homes, and its consequential negative effect for population when compared with the alternative, the delivery of 362 new homes.

Under the Do-Nothing alternative, there would be no new residential neighbourhood within the proposed development site. However, this is likely to be short term having regard to the fact that the site is zoned for residential development. The proposed development will change the character of the landscape and harmonise with the surrounding development. Any resulting effect of this can be managed by well-considered, high quality design, that respects the setting. Moreover, provisions for future pedestrian and cyclist connectivity to the east of the site as outlined in objective CLU-08 of the Development Plan would not be made and this would be to the detriment of pedestrian and cyclist infrastructure for the wider area.

To conclude, the Do-nothing alternative is an inappropriate and unsustainable approach that would result in the inefficient use of a strategically located and of zoned residential lands located in proximity to Carrigaline town centre. With the mitigation measures proposed in this EIAR and having regard to the findings that no significant effects on the environment are expected with such measures in place, the comparative environmental effects are not considered sufficient to rule out the proposed development.

The primary likely significant environmental impacts of the proposed development are fully addressed in the relevant specialist Chapters of this EIAR. These impacts relate to Population & Human Health, Land & Soil, Water & Hydrology, Landscape & Visual, Noise & Vibration, as well as Air Quality & Climate associated with the proposed development.

The proposed development has the potential for cumulative, secondary, and indirect impacts, these can be difficult to quantify due to complex inter-relationships. All interactions and cumulative impacts have been addressed in Chapter 16 Significant Interactions with cumulative impacts and interactions fully addressed in the relevant specialist Chapters of this EIAR.

3.3.2 Alternative Locations

The suitability of the proposed development site for residential development is confirmed by the Cork County Development Plan 2022-2028 and the site specific zoning objective for the site (CL-R-10). The objective for this specific land-zoning is as follows;

“Medium B density residential development to include a mix of house types accompanied with appropriate landscaping. Access to the site will be from the R611 and the Mountain Road. Specific arrangements will be made for the provision and construction of the link road (CL-U-07) the southern relief road, amenity walk (CLU-08)”

The Development Plan was the subject of a Strategic Environmental Assessment (SEA).

Article 5 of the SEA Directive requires the environmental report to consider “reasonable alternatives taking into account the objectives and the geographical scope of the plan or programme” and the significant effects of the alternatives selected. 3 no. strategic alternatives were considered:

- 1 Alternatives Scenario 1: Balanced allocation of SPA growth between Greater Cork Ring, North and West Cork.
- 2 Alternatives Scenario 2: Allocation of Growth to SPA's proportionately
- 3 Alternatives Scenario 3: Water and Waste Services Approach
- 4 Alternative Scenario 4: Limit growth within the Blackwater Catchment to Mallow (Key Town)
- 5 Alternative Scenario 5: Ecosystems Services Approach.
- 6 Alternative Scenario 6: Alternatives for Rural housing designations.

It was concluded that Alternative 2, was the preferred scenario and would contribute to sustainable development, and as such, would result in positive impacts when tested against the Environmental Protection Objectives.

According to the Development Plan, Alternative 2 was selected as the preferred scenario as it represented the following;

“a balanced recognition of established patterns of development in the county having regard to the requirements of the NPF and RSES. The approach provides for rural protection while allowing an appropriate level of growth within lower tier settlements. This approach works with existing and planned delivery of services infrastructure and presents the best option towards sustainable transport.”

Moreover, the Development Plan notes the following in relation to the decision to adopt Alternative 2 as the scenario of preference;

“Alternative 2 supports local communities and population, supporting provision of local services and infrastructure, which assists in countering isolation without impact on surrounding environment. While having some uncertain environmental effects these can be mitigated and Alternative 2 is a balanced sustainable approach to planned development for the county as a whole. As such Alternative 2 has been selected as the basis of the preparation of the Development Plan.”

Considering the site’s zoning objective and the fact that the Development Plan was assessed by SEA, it is considered that in this context, there is no reasonable alternative location.

3.3.3 Alternative Uses

3.3.3.1 Cork County Development Plan 2022-2028

The primary determinant of suitable uses is established in the site’s zoning, as per the Cork County Development Plan 2022-2028. The proposed development site is zoned CL-R-10 for Medium B Residential Development. In addition to the site specific objective, the Development Plan contains more general objectives for sites zoned ‘Residential’. The Development Plan states the following policy approach for these zoned area;

“residential areas are intended primarily for housing development but may also include a range of other uses, particularly those that have the potential to foster the development of new residential communities. These are uses that benefit from a close relationship to the immediate community and have high standards of amenity, such as crèches, schools, nursing homes or homes for older people, open space, recreation and amenity uses”.

In principle, an application for any one or a combination of the uses listed above could be progressed on the site subject to compliance with other policies and objectives in the Development Plan.

Having regard to the site’s zoning designation under the Development Plan, the reasonable alternative scenario for the development of the proposed site is:

- i. A residential development; or
- ii. A residential led mixed use scheme incorporating some permitted in principle uses.

Therefore, the proposed residential development, which includes the provision of a childcare facility, community room and café, is considered an appropriate use for the subject site.

3.3.4 Alternative Design (including size & scale)

The layout of the proposed development went through a detailed design process with input from Cork County Council and the entire applicant’s design team and the EIAR team.

3.3.4.1 Alternative Design No. 1 – Initial Sketch Design

Alternative 1 was developed as part of early development proposals prior to the submission of design proposals to Cork County Council. At this stage, the layout proposed to retain many of the existing hedgerows on site however, it also proposed to remove a number of hedgerows and further consideration was needed in order to retain more. It was decided that the layout would be arranged around the retention of the central woodland scrub area at the heart of the site. Dwellings were orientated to passively survey public open spaces throughout the site and allowed for adequate distances between dwellings to limit overlooking. Pedestrian links were proposed through the site to promote effective circulation and promote permeability within the scheme and a hierarchy of these routes and access along the eastern laneway needed to be included / further developed.

The key details of the proposal at this stage were as follows:

Table 3.1 Key Site Statistics – Alternative Design 1

Site Statistics	Alternative A
Site Area	10.87 (gross) 9ha (net)
Total No. Units	314
Creche	80 childcare places
Density	35 units/ha
Open Space	12% of site area



Figure 3.1 Alternative Design No. 1 (Source: Deady Gahan Architects)

3.3.4.2 Alternative Design No. 2 – S.247

Alternative Design No. 2 was presented to Cork County Council and discussed as part of the Section 247 pre-planning application meeting held on 10th May 2024. This meeting was to discuss the Large Scale Residential Development Proposal. At this stage the proposal consisted of a total of 318 no. units at a density of 36.5 units/ha, along with the provision of 1 no. childcare facility. An existing laneway along the eastern boundary was included as part of an active travel proposal for the scheme and allowance for a future connection of the greenway to the east was provided.

A large number of hedgerows are shown to be retained and while a strategy for open space was provided, further consideration needed to be formed to develop more usable open spaces. Useable open space within the scheme was 12% at this stage.

Dwellings were orientated to passively survey public open spaces throughout the site and allow for adequate distances between dwellings to limit overlooking, however further development of unit types / character area was needed.

Access to the site was shown via Mountain Road and at this stage looped streets were proposed throughout the scheme, providing primary and local access streets with shared surfaces. Further development of parking arrangements and avoidance of street dominance was needed.

A higher density courtyard was formed to the east of the development site, which accommodated ground floor accessible units. However, further consideration of quality of open space in this area was needed.

Table 3.2 Key Site Statistics – Alternative Design 2

Site Statistics	Alternative 2
Site Area	11.47 (gross)
	8.7ha (net)
Total No. Units	318
Creche	80 childcare places
Density	36.5 units/ha
Open Space	12% of net site area



Figure 3.2 Alternative Design No. 2 (Source: Deady Gahan Architects)

The Council provided feedback on this layout including the following key points:

- Requirement to provide access to the site from the R611 and Mountain Road.
- Clarification required regarding greenway connection to the east
- Specific arrangements to be made for the provision and construction of the link road (CL-U-07) and amenity walk (CL-U-08) as per the zoning objective for the site.
- Requirement for a shared surface to be provided along Mountain Road to facilitate both pedestrians and cyclists.
- The creation of a neighbourhood centre with a creche and small-scale convenience retail was encouraged

3.3.4.3 Alternative Design No. 3 – Second S.247

Alternative Design No. 3 was presented to Cork County Council and discussed as part of a second Section 247 pre-planning application meeting held on 31st July 2024.

At this stage the proposal consisted of a total of 318 no. units at a density of 35.3 units/ha along with a childcare facility, community room and café/retail unit, reflecting the request made by the Council as part of the first Section 247 meeting. Useable open space was increased to 16% of the site area further to the inclusion of the central open space area into the calculation of useable open space. A reduction of streets and car dominance was also reflected in the layout, although it was adjudged that further consideration to develop this more was required.

It was explained at the second Section 247 meeting by the applicant that access to the R611 from the site was not possible and the case was made that the objective of the zoning for the site does not state that direct access to the R611 was required.

It was emphasized that the proposed development (of the CL-R-10 site) also makes provision for vehicular/pedestrian and cycle connectivity between the CL-R-10 and CL-R-07 sites and when both sites have been developed, there will be vehicular/pedestrian and cycle connectivity between Mountain Road and the R611, however through traffic from the CL-R-10 site will not be encouraged through the CL-R-07 site.

The proposed development of the CL-R-10 site also included significant improvements to Mountain Road at this stage, which will deliver significant sections of the CL-U-07 (road) and CL-U-08 (greenway) objectives. Delivering these improvements in the form of pedestrian/cyclist shared surface needed to be considered further in respect of whether this was to be provided along the northern or southern side of the Mountain Road.

Table 3.3 Key Site Statistics – Alternative Design 3

Site Statistics	Alternative 3
Site Area	11.4 (gross)
	9ha (net)
Total No. Units	318
Creche	80 childcare places
Community Room	100sqm (approx.)
Café/Retail Unit	66sqm (approx.)
Density	35.3 units/ha
Open Space	16% of net site area



Figure 3.3 Alternative Design No. 3 (Source: Deady Gahan Architects)

3.3.4.4 Alternative Design No. 4 – S.32B

Alternative Design No. 4 was presented to Cork County Council and discussed as part of a Section 32B meeting held with Cork County Council, on 14th November 2024.

At this stage the proposal consisted of 362 no. units. The additional units proposed compared to previous layouts was as a result of the receipt of consent from the relevant landowner. The density proposed was 35.4 units/ha and the layout continued to propose the construction of a childcare facility, community room and café/retail unit. Useable open space was 16.2%.

The community building was reorientated to allow for a strong urban edge along the greenway to the east, while the Plaza to the south of the community building increased in size to allow for greater neighbourhood activity.

The inclusion of units to the north-east of the site helps to complete urban form and provide passive surveillance along eastern laneway / proposed greenway. The layout at this stage saw a reduction in the number of streets and car dominance throughout the scheme and pedestrian connectivity was increased.

Moreover, detailed design was provided for the central woodland area

Following on from additional consultation with the Council’s Regional & Local Roads Design Office, at this stage of the design process, the applicant had secured the consent of all of the landowners on the northern side of Mountain Road which allowed for the proposal for a continuous 3 metre shared cycle/pedestrian connection from the proposed development to the Council’s Part 8 development works on the Kilmoney Road, as part of this development. Providing this shared surface along the northern side of the road as opposed to the southern side was considered more appropriate. All of these works were included within the red line at this stage.

Table 3.4 Key Site Statistics – Alternative Design 4

Site Statistics	Alternative 4
Site Area	12.97 (gross) 10.24ha (net)
Total No. Units	362
Creche	80 childcare places
Community Room	103.6sqm
Café/Retail Unit	83.9sqm
Density	35.4 units/ha
Open Space	16.2% of net site area



Figure 3.4 Alternative Design No. 4 (Source: Deady Gahan Architects)

3.3.4.5 Alternative Design No. 5 – Preferred Alternative – Final Design Proposed

Alternative Design No. 5 is the final design proposed as submitted to Cork County Council as part of the Large-Scale Residential Development application. The final design proposed consists of 362 no. units.

The final design directly responds to the Council’s feedback issued as part of their 32D Opinion and is overall an accumulation of high quality design stemming from design team input and feedback from Cork County Council throughout the planning process.

The proposal retains the 362 no. units and density of 35.4 units/ha presented at S.32B stage, with usable open space at 16.3%.

Significant work was carried out to introduce an innovative elevational treatment to Character Area 2 which creates a greater variation in Character Areas. Separation distances were also increased to ensure high quality private amenity is achieved throughout the scheme.

The removal of parking and introduction of various parking arrangements to certain areas was developed and now forms part of the proposal. Balconies have also been designed into the footprint of the duplex units to avoid ‘clip-on’ structures.

The inclusion of more kickabout and grassed areas is evident in the final layout with 2 no. narrow semi-detached units replacing 4 no. townhouse units to the south of the western courtyard open space. This alteration enlarges this amenity area and allows for a more usable open space for future residents.

The final site plan also outlined another development to the east of the site, which is currently awaiting a decision from Cork County Council, at time of writing. This development has been considered as part of cumulative effects throughout this EIAR.

Table 3.5 Key Site Statistics – Final Design – Submitted Scheme

Site Statistics	Final Design –Submitted to Council for Planning
Site Area	12.97 (gross) 10.24ha (net)
Total No. Units	362
Creche	102 childcare places
Café	103.6sqm
Community Room	83.9sqm
Density	35.4 units/ha
Open Space	16.3% of net site area
Car Parking Spaces	584 no.
Bicycle Parking Spaces	102 no.



Figure 3.5 Final Design of Submitted Scheme (Source: Deady Gahan Architects)

3.3.5 Alternative Processes

Due to the nature and scale of the proposed development (i.e. a residential development greater than 100 residential units), the only option is to submit a Large-Scale Residential Development planning application to Planning Authority. Therefore, there is no alternative process to consider.

3.4 Difficulties Encountered

There were no difficulties encountered in the preparation of this assessment for the proposed development.

3.5 Conclusion

On the basis of the foregoing, it is considered that all reasonable alternatives to the project are considered, and no alternatives have been overlooked which would significantly reduce or further minimise environmental effects. Having considered all alternatives, the final design chosen by the applicant as presented is deemed to be the most suitable project for the site.

CHAPTER FOUR

POPULATION & HUMAN HEALTH



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER FOUR

Table of Contents

Population & Human Health

4.1	Introduction	4-1
4.2	Expertise and Qualifications	4-1
4.3	Proposed Development	4-1
4.4	Methodology	4-1
4.5	Baseline Environment.....	4-2
4.6	The ‘Do Nothing’ Scenario	4-15
4.7	Difficulties Encountered	4-15
4.8	Consultation.....	4-15
4.9	Impact Assessment.....	4-16
4.10	Mitigation Measures	4-18
4.11	Residual Impact Assessment	4-18
4.12	Interactions	4-18
4.13	Risk of Major Accidents or Disasters	4-20
4.14	Worst Case Scenario.....	4-20
4.15	Monitoring.....	4-20
4.16	Conclusion	4-20
4.17	References and Sources	4-20

Table of Tables

Table 4-1 Population 2016 & 2022, and Percentage Change (Source: CSO)	4-8
Table 4-2 Census 2022, Proportion of Households by Size	4-9
Table 4-3 Population and Housing in Carrigaline (Source: CSO)	4-10
Table 4.4 Social Class and Socio-Economic Group by Occupation (Source: CSO).....	4-11
Table 4.5 Existing Childcare Providers in Carrigaline (Source: McCutcheon Halley Planning Consultants)	4-11
Table 4.6 Existing Primary Schools and Special Schools in Carrigaline (Source: McCutcheon Halley Planning Consultants)	4-12
Table 4.7 Existing Post-Primary Schools in Carrigaline (Source: McCutcheon Halley Planning Consultants)	4-13
Table 4-8 Medical Facilities in Study Area	4-14
Table 4-9 Sports and Recreational Facilities in Study Area	4-14
Table 4.10 Retail and Convenience Stores in Study Area	4-15
Table 4.11 Expected Population Yield by Age	4-17

Table of Figures

Figure 4.1 Application Area and Surrounding Context (Source: McCutcheon Halley)	4-2
Figure 4.2 Site Zoning as per the Cork County Development Plan 2022-2028 (Source: Cork County Council and McCutcheon Halley Planning Consultants).....	4-2
Figure 4.3 Site Boundary & Surrounding Context (Source McCutcheon Halley Planning Consultants)	4-3
Figure 4.4 Site Proximity to 220 Bus Service (Source: McCutcheon Halley Planning Consultants	4-3
Figure 4.5 Map of 220 Bus Service Route (Source: Moovit).....	4-4
Figure 4.6 Location of Site in proximity to future Cork Bus Connects Route 3 Service (Source: Cork Bus Connects)	4-4
Figure 4.7 Walking Isochrones 5 minute intervals from Site (Source: MHL Consulting Engineers.....	4-5
Figure 4.8 2km Radius from Development Site (Source: McCutcheon Halley)	4-5
Figure 4.9 Existing Cycle Infrastructure in context of Development Site (Source: McCutcheon Halley)	4-6
Figure 4.10 Cycling Isochrones 5min Interval Range from Site (Source: MHL Consulting Engineers)	4-6
Figure 4.11 Proposed works along Mountain Road to tie into Part 8 Proposals (Source: OSL Consulting Engineers).	4-7
Figure 4.12 Census 2022 Map of Carrigaline with development boundary outlined for context (Source: CSO and McCutcheon Halley Planning Consultants).....	4-7
Figure 4.13 Population and Housing Targets for Carrigaline as per Cork County Development Plan 2022-2028 (Source: Cork County Council)	4-8

Figure 4.14 Population Pyramid for Carrigaline (Source: Census 2022)	4-8
Figure 4.15 Deprivation Index for Carrigaline with Development Site identified in Red (Source: Pobal)	4-9
Figure 4.16 Health Status of Carrigaline Population as per Census 2022	4-9
Figure 4.17 Occupancy Status of Households in Carrigaline (Source: Census 2022)	4-10
Figure 4.18 Principal Economic Status of Carrigaline population aged 15 years and over (Source: Census 2022)	4-11
Figure 4.19 Location of Childcare Facilities within Carrigaline	4-12
Figure 4.20 Location of Primary Schools in Carrigaline	4-12
Figure 4.21 Location of Post-Primary Schools in Carrigaline	4-13
Figure 4.22 Healthcare Facilities in Study Area (Source: McCutcheon Halley)	4-13
Figure 4.23 Sports and Recreational Facilities in Study Area	4-14
Figure 4.24 Retail and Convenience stores located in Carrigaline (Source: McCutcheon Halley Planning Consultants)	4-15

CHAPTER FOUR | Population & Human Health

4.1 Introduction

According to the European Commission's Environmental Impact Assessment of Projects: Guidance on the Preparation of the Environmental Impact Assessment Report (2017), human health is; *"a very broad factor that would be highly project dependent. The notion of human health should be considered in the context of the other factors in Article 3(1) of the EIA Directive and thus environmentally related health issues (such as health effects caused by the release of toxic substances to the environment, health risks arising from major hazards associated with the Project, effects caused by changes in disease vectors caused by the Project, changes in living conditions, effects on vulnerable groups, exposure to traffic noise or air pollutants) are obvious aspects to study. In addition, these would concern the commissioning, operation, and decommissioning of a Project in relation to workers on the Project and surrounding population."*

The Environmental Protection Agency (EPA) Guidelines on the Information to be contained in Environmental Impact Assessment Reports (2022) advise that *"in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in this EIAR e.g. under the environmental factors of air, water, soil etc."*

This chapter addresses the likely significant environmental impacts of the proposed development on population and human health. It is noted that other chapters of the EIAR also deal with likely significant environmental effects on population and human health arising from traffic and transportation, air quality and climate, noise and vibration, landscape and visual, material assets: utilities and the risk of major accidents and/or disasters and those chapters should be referenced in conjunction with this chapter of the EIAR.

4.2 Expertise and Qualifications

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master's in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 2 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR's, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, single 'one – off' developments, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

4.3 Proposed Development

A full description of the proposed development is provided in Chapter 2 of this EIAR. To summarise, the applicant seeks permission for the development of 362 no. residential units, a creche and all ancillary site development works on a proposed development site of 12.97 hectares, at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

4.4 Methodology

This chapter has been prepared pursuant to Schedule 6 of the Planning and Development Regulations 2001 (as amended). Section 2 of Schedule 6 sets out the additional information relevant to the specific characteristics of the project required,

which includes a description of the likely significant effects on the environment of the proposed development resulting from, among other things;

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

The Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022) state that:

"... in an EIAR, the assessment of impacts on population and human health should refer to the assessments of those factors under which human health effects might occur, as addressed elsewhere in the EIAR e.g., under the environmental factors of air, water, soil, etc."

Recital 22 to the EIA Directive provides that:

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

The EPA Advice Notes (EPA 2003) recommend considering the following issues when assessing the potential impacts and effects of a proposed development on Population and Human Health:

- Economic Activity Likely to Lead to Projects – Will the development stimulate additional development and/or reduce economic activity, and if either, what type, how much and where?
- Social Consideration – will the development change the intensity of patterns and types of activities and land use?
- Land Use – will there be severance, loss of rights of way or amenities, conflicts, or other changes likely to ultimately alter the character and use of the surroundings?
- Tourism – will the development affect the tourism profile of the area?
- Health – have the vectors through which human health impacts could be caused been assessed, including adequate consideration of inter relationships between those assessments.

4.4.1 Relevant Legislation & Guidance

Publications and other data sources consulted include:

- National Planning Framework, Ireland 2040 – Our Plan (Government of Ireland, 2018);
- Draft Revised National Planning Framework;
- Southern Regional Spatial and Economic Strategy 2019-2031;
- Cork County Development Plan 2022-2028;
- Central Statistics Office (CSO) website www.cso.ie;
- Department of Education (DE) website <https://www.gov.ie/en/organisation/departments-of-education/>;
- Pobal website <https://maps.pobal.ie/>; and
- Health and Safety Authority website <https://hsa.ie>.

Additionally, reports prepared by McCutcheon Halley Planning Consultants included with this application under separate cover were consulted, as follows:

- Childcare Demand Report;
- School Demand Assessment Report; and
- Planning Statement.

This chapter has been prepared having regard to the following guidelines:

- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 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 (EPA, 2022)

The impact assessment section of this chapter follows the terminology (where applicable) used in the EPA Guidelines as set out in Chapter 1 of this EIAR.

4.5 Baseline Environment

4.5.1 Application Area

The proposed development site comprises a gross area of 12.97 hectares, with a net developable area of 10.24 hectares at Mountain Road, Kilmoney (townland), Co. Cork.

The site is situated the south-west of Carrigaline, is within the settlement boundary of the town, and is located within 2km of the Main Street.

The subject land is predominantly a greenfield site which has features and characteristics which will help create a positive living environment by retaining the natural assets and ecological features contained within its parkland setting.

The site boundary extends from the development site to the north along Mountain Road, to where it intersects with the R611.



Figure 4.1 Application Area and Surrounding Context (Source: McCutcheon Halley)

4.5.2 Land Use Zoning

In accordance with the Cork County Development Plan (CDP) 2022-2028, the subject site is primarily zoned CL-R-10 with the following zoning objective;

“Medium B density residential development to include a mix of house types accompanied with appropriate landscaping. Access to the site will be from the R611 and the Mountain Road. Specific arrangements will be made for the provision and construction of the link road (CL-U-07) the southern relief road, amenity walk (CLU-08)”

Parts of the site boundary is zoned as ‘ER -Existing Residential/Mixed Residential and Other Uses’. According to the CDP, the objective for this zoning is

“to conserve and enhance the quality and character of established residential communities and protect their amenities.”



Figure 4.2 Site Zoning as per the Cork County Development Plan 2022-2028 (Source: Cork County Council and McCutcheon Halley Planning Consultants).

4.5.3 Surrounding Land Uses

The area surrounding the lands comprise a mix of uses but are mostly residential and agricultural in character. There are a number of individual one-off dwelling houses located along Mountain Road, on both sides of the carriageway. To the south and west of the site are greenfield, agricultural lands, while to the east of the site is an existing farmyard. To the east of the southern portion of the proposed development is the existing Wheatfields residential estate, which consists of mostly two-storey large, detached dwelling units. To the southeast of the site there is a current, live planning application for residential units (Ref No. 246418). An outline of this proposed development, which at time of writing remains undecided, is shown on the final site layout plan as shown in Chapter 2.



Figure 4.3 Site Boundary & Surrounding Context (Source McCutcheon Halley Planning Consultants)

4.5.4 Sensitive Receptors

In identifying potential impacts and receptors, consideration was given to the proposed residential scheme and the identified receiving environment.

For the purpose of this chapter, the primary sensitive receptors are:

- I. Existing residential dwellings in the vicinity of proposed development site, in particular the existing one-off dwelling houses located along Mountain Road, to the north and east of the development site.
- II. Users of the public road network, specifically the users of the Mountain Road and of the R611

4.5.5 Public Transport

The site is within a 10-minute walking distance of a nearby bus stop, which is served by the 220 bus service, and connects Carrigaline with Douglas, Cork City, University College Cork and Ballincollig. This service officially operates on a 15-minute frequency and runs on a 24-hour basis, providing an important service for the town of Carrigaline. However, due to driver shortages, a Bus Eireann review of the service has come into temporary effect, with the frequency of the service now operating on a 20-minute frequency. The official 15-minute frequency is due to come back into effect pending the resolution of staffing issues.



Figure 4.4 Site Proximity to 220 Bus Service (Source: McCutcheon Halley Planning Consultants)

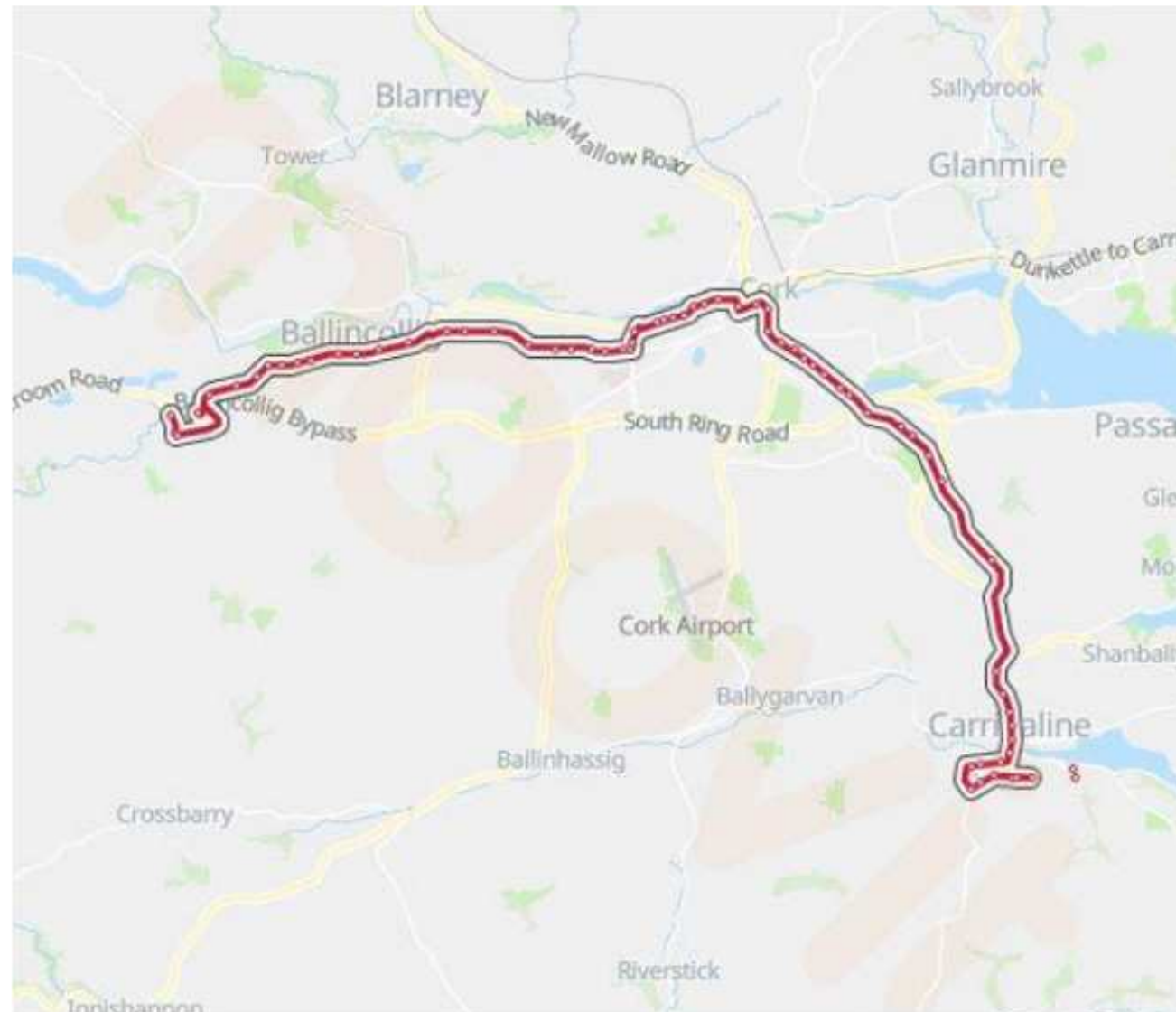


Figure 4.5 Map of 220 Bus Service Route (Source: Moovit)

As part of Cork Bus Connects proposals, new bus routes are expected to be established in the near future. The site will continue to be well served as a result, with three different bus routes proposed to operate in close proximity to the site. One of these is the No. 3 Bus which is expected to run on a 10-minute frequency. All routes proposed connect Carrigaline with Cork City. Please refer to Figure 4.6 highlighting the location of the site in the context of the new route proposed.

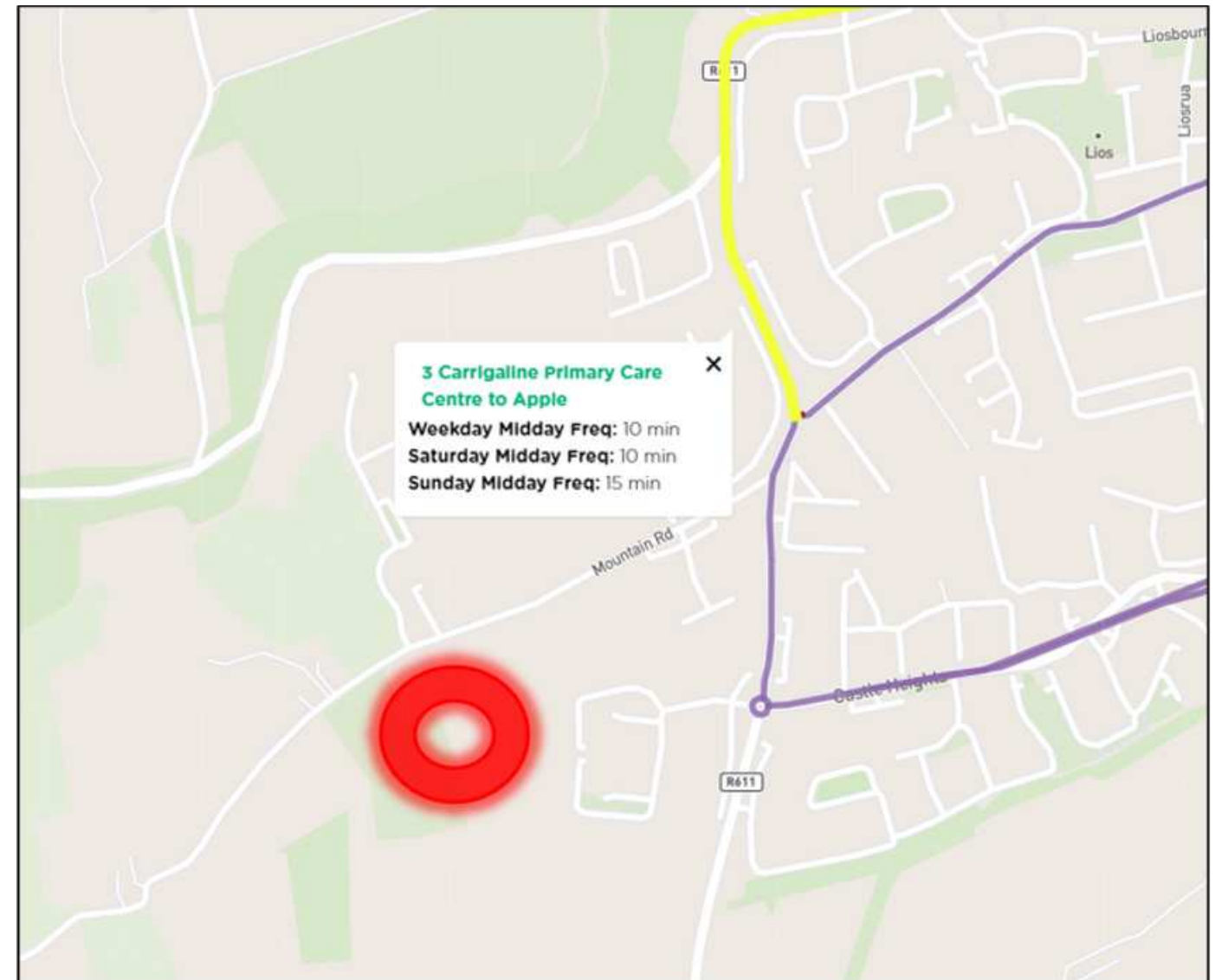


Figure 4.6 Location of Site in proximity to future Cork Bus Connects Route 3 Service (Source: Cork Bus Connects)

4.5.6 Accessibility – Walking & Cycling

The proposed development will benefit from new pedestrian and cycling infrastructure in the form of a shared 3-metre surface to be proposed along Mountain Road. This shared surface will tie into the existing footpath network on the R611, providing consistent pedestrian/cyclist connectivity to Main Street, Carrigaline.

Figure 4.7 represents the foot travel times in 5 minute intervals from the site, while Figure 4.8 represents a 2km radius from the site.

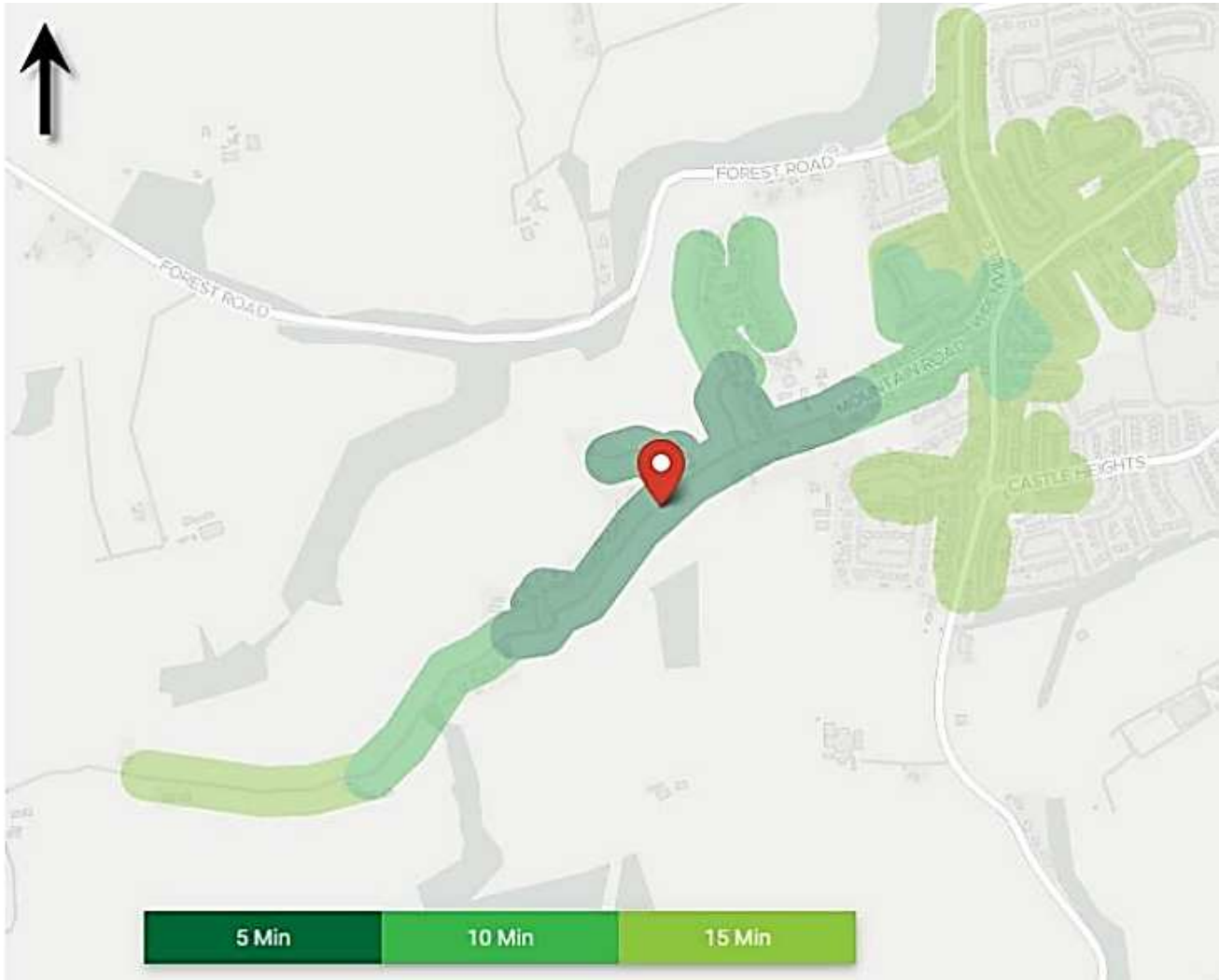


Figure 4.7 Walking Isochrones 5 minute intervals from Site (Source: MHL Consulting Engineers)

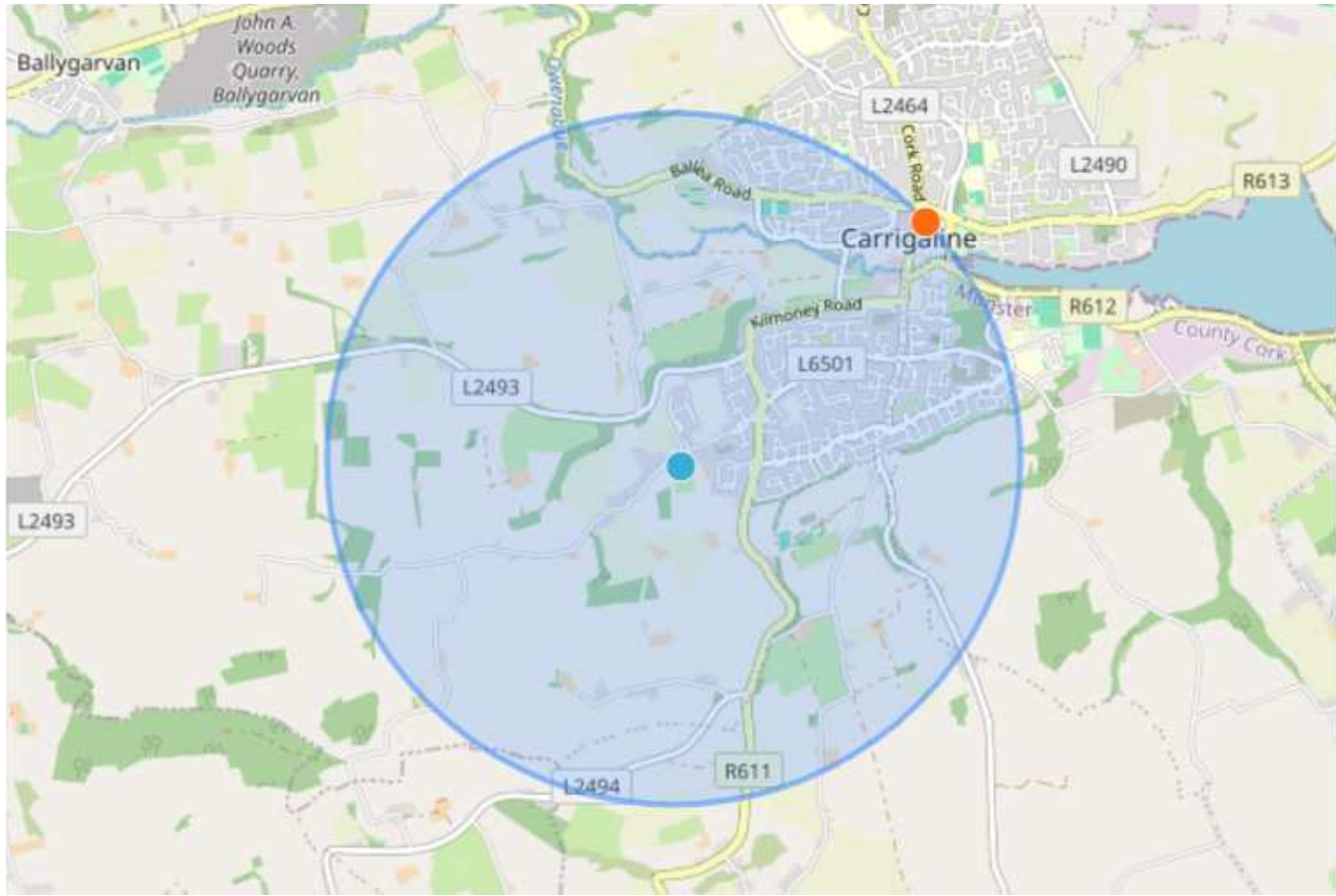


Figure 4.8 2km Radius from Development Site (Source: McCutcheon Halley)

In respect of cycling infrastructure existing cycle facilities are limited in the area. However, there are 2no. 2m wide cycle tracks along the internal Castle Heights/Forest Hill estates and Cherry Blossom Hill, where cyclists have dedicated cycle facilities on both sides of the carriageway for approx. 2km until Cherry Blossom Hill meets the junction at the R612. Figure 4.9 highlights the presence of this existing infrastructure in the context of the development site, with the outline of proposed works to Mountain Road also indicated.

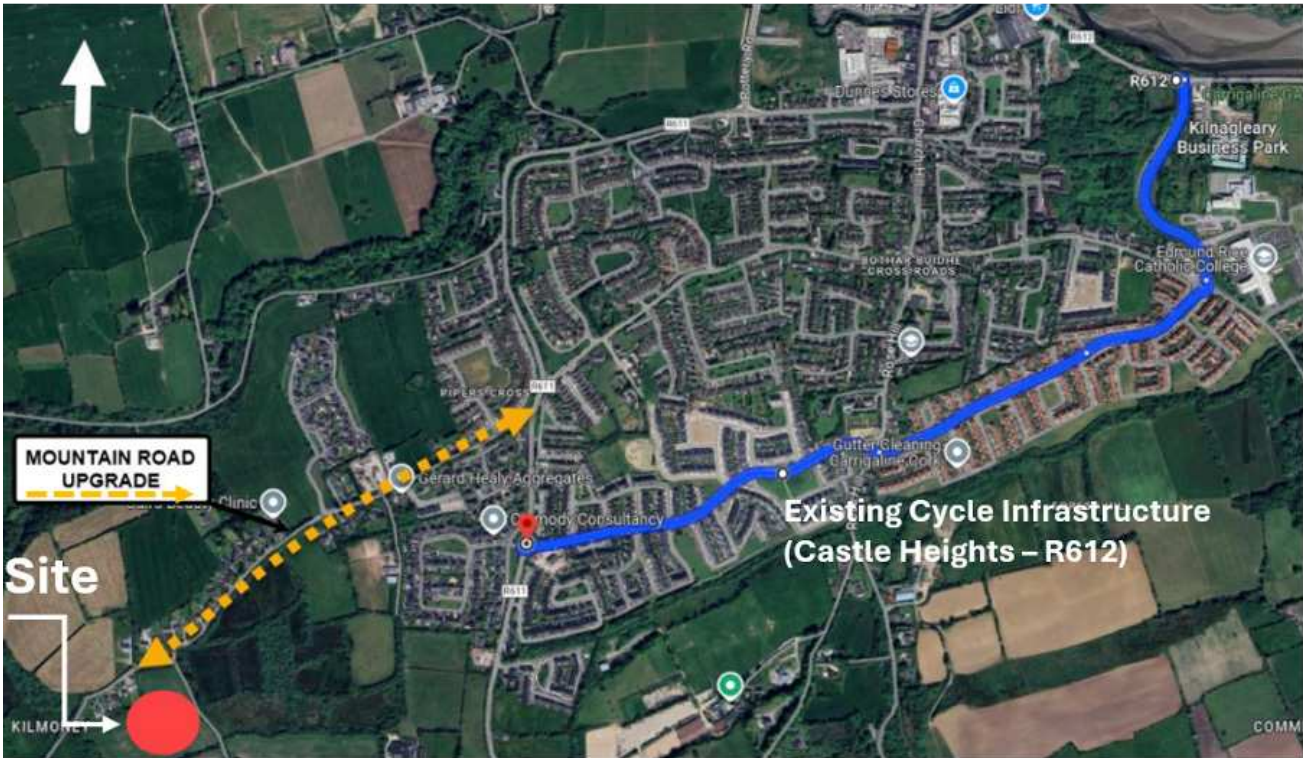


Figure 4.9 Existing Cycle Infrastructure in context of Development Site (Source: McCutcheon Halley)

Figure 4.10 shows cycling travel times in 5 min intervals from the development site. It shows that the entire town area is within a 15-minute cycle of the site. Figure 4.11 shows the proposal for upgrades along Mountain Road as part of the proposed development which includes the provision of a 3m shared surface which will promote pedestrian and cyclist travel.

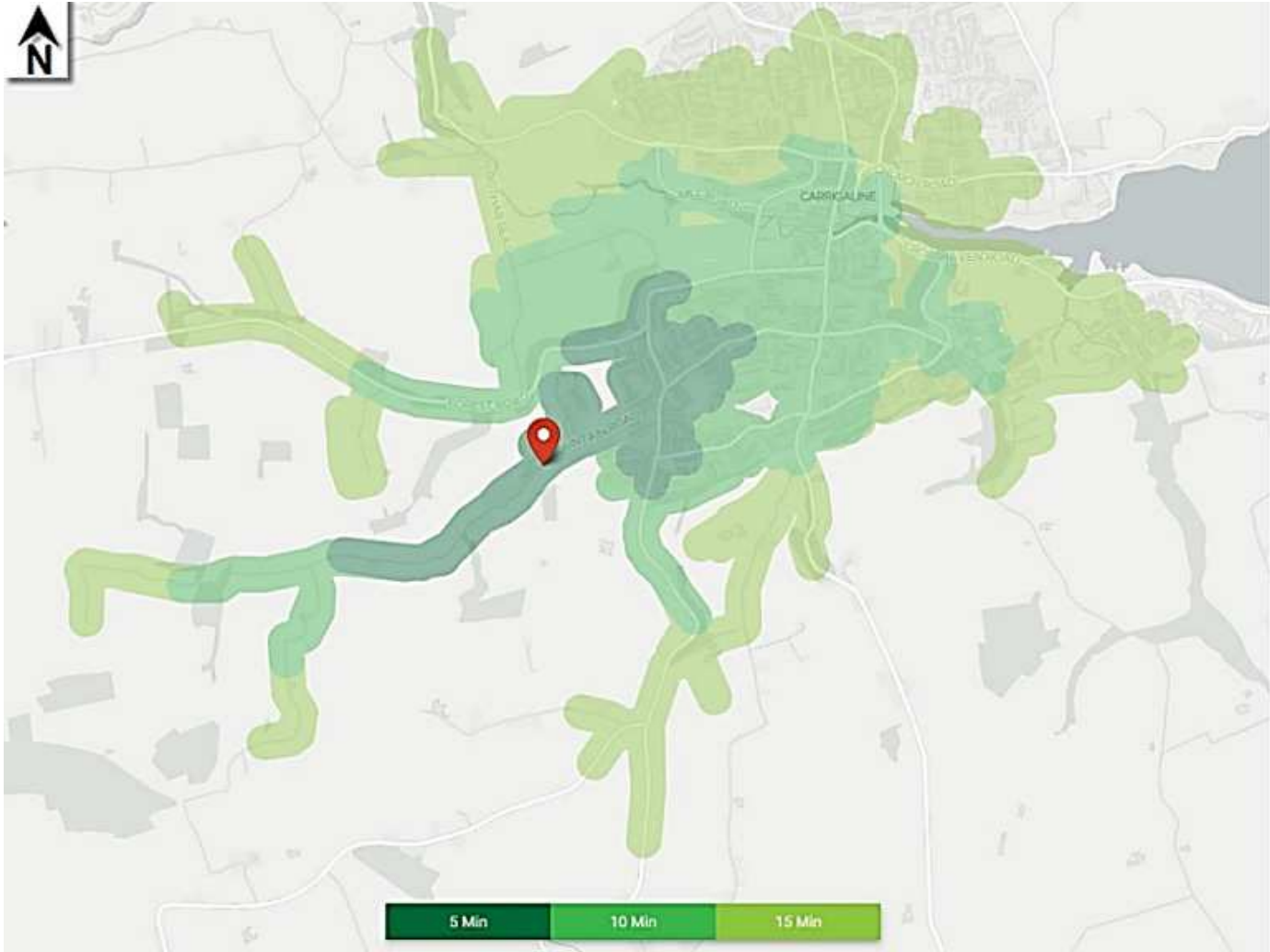


Figure 4.10 Cycling Isochrones 5min Interval Range from Site (Source: MHL Consulting Engineers)



Figure 4.11 Proposed works along Mountain Road to tie into Part 8 Proposals (Source: OSL Consulting Engineers).

4.5.7 Air Quality

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 and domestic fuel burning.

4.5.8 Population

This section reviews the demographic characteristics, population, and age structure of the town of Carrigaline. The demographic profile of the Urbans Area within the study was examined utilising the CSO Census of Population Statistics dated 2022. Therefore, the data presented within this section reflects the most recent data available to the public. Figure 4.12 represents the area of study, with CSO Census 2022 data available for the ‘Town’ of Carrigaline.

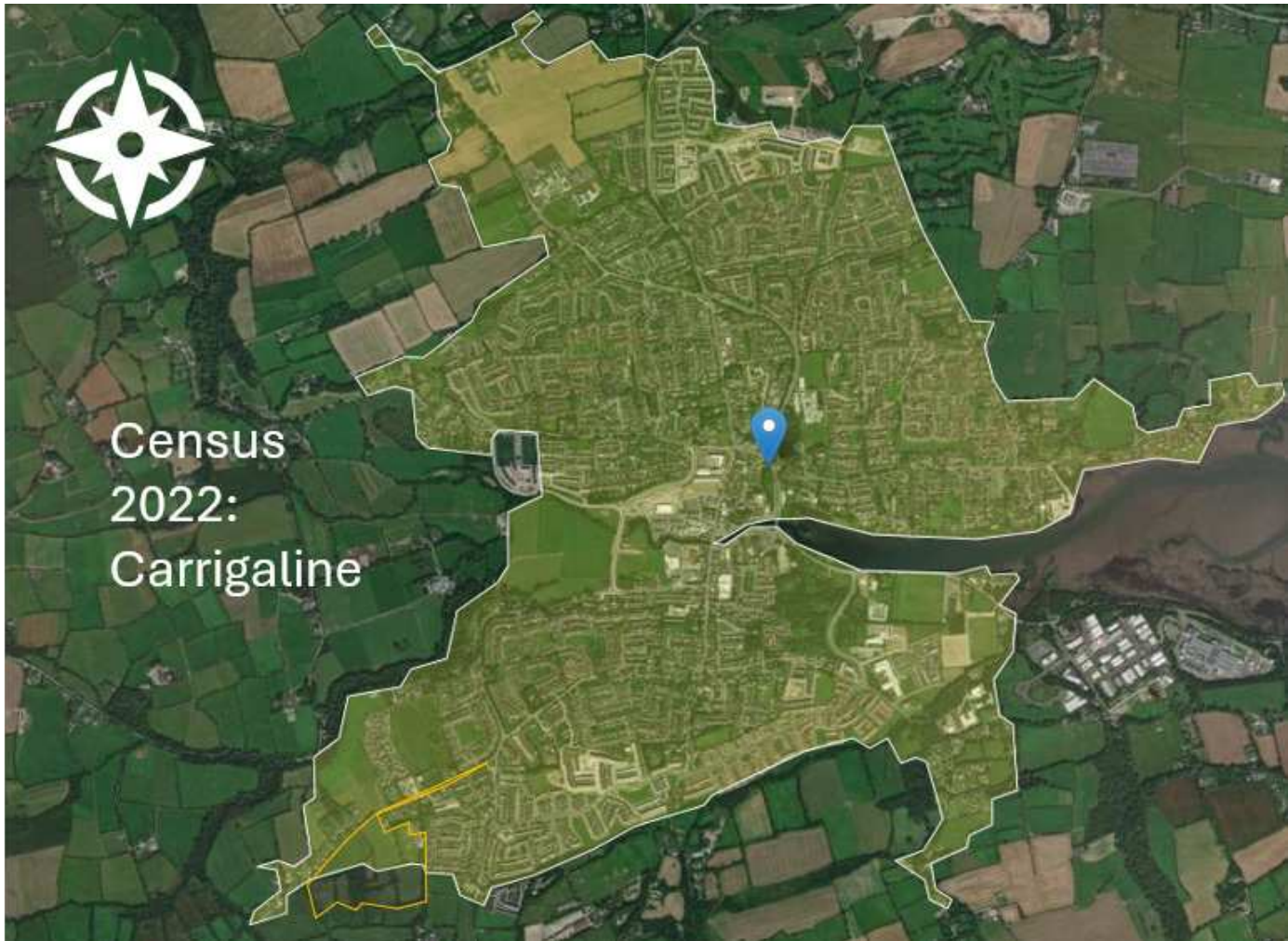


Figure 4.12 Census 2022 Map of Carrigaline with development boundary outlined for context (Source: CSO and McCutcheon Halley Planning Consultants)

According to Census 2022, the population of the town of Carrigaline has been totalled to 18,239 persons which is an increase of 2,469 persons since the 2016 Census for the town, representing a rise in population of 15.7%. The Cork County Development Plan has set an allocated target population for Carrigaline of 20,495 within the lifetime of the Plan (2028), which is to be achieved through the construction and occupation of 1,806 residential units. Figure 4.13 is an extract taken from the Cork County Development Plan, which provides population and housing stats for Carrigaline.

	Population and Housing Requirement			Housing Supply Units
	Population Census 2016	Population Target (to 2028)	New Units Required (to 2028)	Housing Supply from Residential and Mixed-Use Zoning including Compact Growth Sites
Carrigaline	15,770	20,495	1,806	1,806

	Census 2006	Census 2011	Census 2016	Population Target to 2028
Carrigaline	12,835	14,775	15,770	20,495

Figure 4.13 Population and Housing Targets for Carrigaline as per Cork County Development Plan 2022-2028 (Source: Cork County Council)

The study area population is evenly split between males and females, with females constituting 51% and males accounting for 49% of the population. The two largest age cohorts for the study area of Carrigaline are the 40-44-years-old (9.2%) and the 10-14-year-olds (8.6%). The two smallest age groups in the town according to the Census are the 80-84 year-olds bracket (1%) and the 85 years and over group (0.6%).

Just under one quarter of the population represents young people aged between 0-14 years old (24%), indicating that Carrigaline has a strong youth base amongst its population, and indicates that Carrigaline has become an attractive place for young families to establish roots.

Figure 4.14 shows the population pyramid for Carrigaline as per Census 2022.

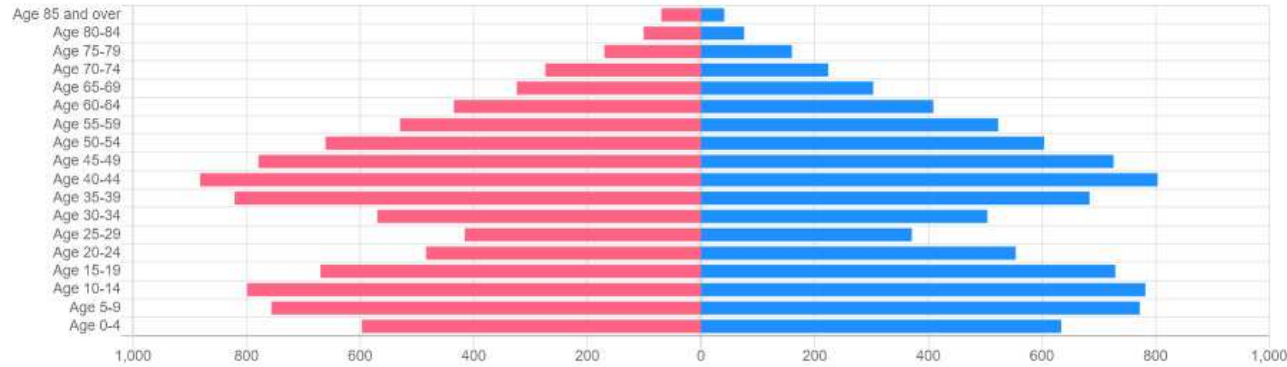


Figure 4.14 Population Pyramid for Carrigaline (Source: Census 2022)

Table 4.1 shows the population change figures by age cohort for period between 2016 and 2022.

Table 4-1 Population 2016 & 2022, and Percentage Change (Source: CSO)

No.	Age	2016	2022	% Change 2016-2022
1	0-4	1349	1231	-8.7%
2	5-9	1508	1528	1.3%
3	10-14	1303	1581	21.3%
4	15-19	1140	1399	22.7%
5	20-24	759	1038	36.8%
6	25-29	707	787	11.3%
7	30-34	1200	1074	-10.5%
8	35-39	1541	1505	-2.3%
9	40-44	1418	1686	18.9%
10	45-49	1236	1505	21.8%
11	50-54	1017	1265	24.4%
12	55-59	839	1053	25.5%
13	60-64	587	844	43.8%
14	65-69	481	627	30.4%
15	70-74	315	498	58.1%
16	75-79	215	330	53.5%
17	80-84	101	177	75.2%
18	85 and over	54	111	105.6%
Total		15,770	18,239	100%

As per the information contained in Table 1, the population with the largest decrease during the inter-census period was that of the 0-4 years age group, with the largest increase in the 85 years and over group.

4.5.9 Deprivation Index

The Pobal Deprivation Index is Ireland’s most widely used social gradient metric, which scores areas in terms of affluence or disadvantage. The index uses information from Ireland’s census, such as employment, age profile and educational attainment, to calculate this score.

Figure 4.13 below shows the level of affluence and deprivation at the Small Area level, according to the Pobal HP Deprivation Index. Scores range from -35 (Extremely Disadvantaged) to +35 (Extremely Affluent). The overall score for Cork County following the 2022 Census was 2.69 (‘Marginally above average’), while the small areas representing the town of Carrigaline consist of a high number of ‘affluent’ and ‘marginally above average’. As shown on Figure 4.15, the development site is located in an affluent area, with Carrigaline as a whole representing an area that is predominantly marginally above average, but with some areas of disadvantage in the town.

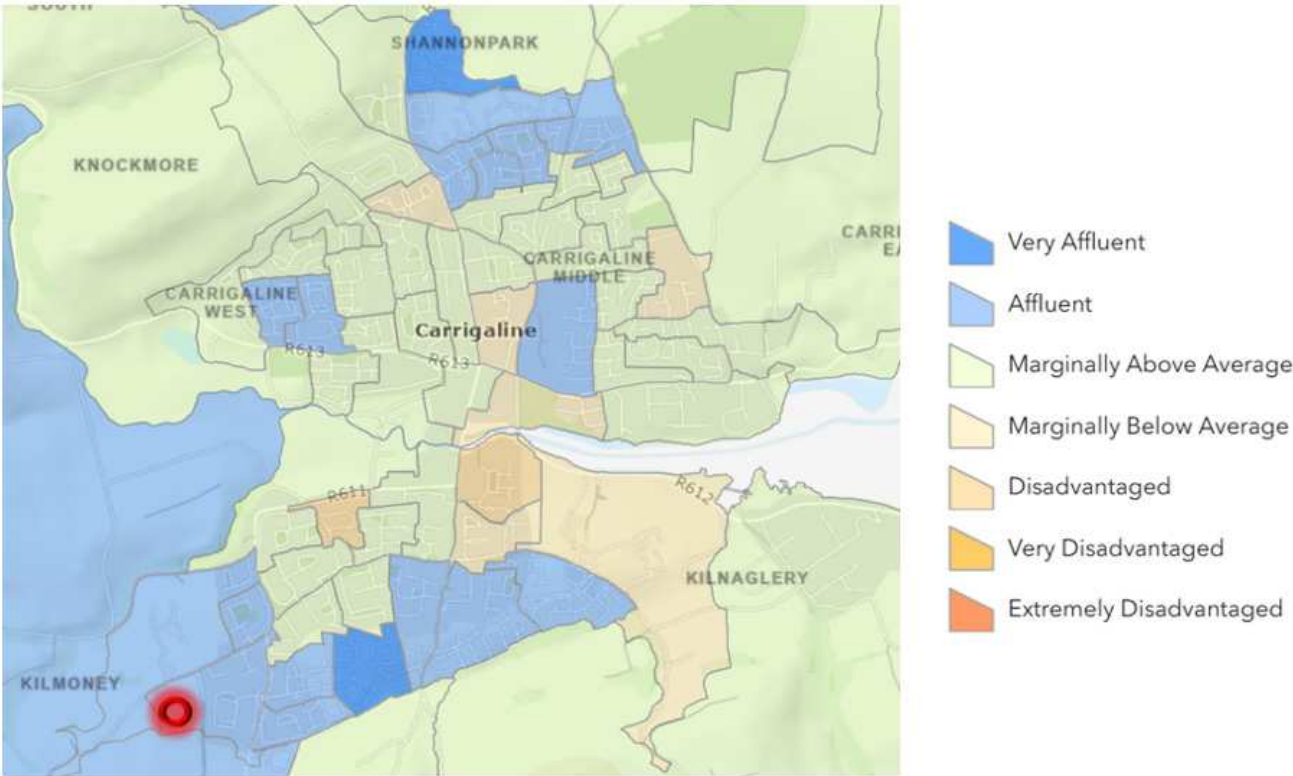


Figure 4.15 Deprivation Index for Carrigaline with Development Site identified in Red (Source: Pobal)

4.5.10 Health

A disability profile has been reviewed for the study area of Carrigaline. The bar chart below shows that 90% of the population consider themselves to be in very good or good health, as 61% are in very good health and 29% are in good health. 6% of people who responded considered their health status to be ‘fair’, while 0.9% of people considered their health to be bad and 0.2% classed it as very bad. A small percentage of respondents did not provide an insight on their health status.

The overall health of Carrigaline’s population is good, with over 90% rating their health as either "very good" or "good"; however, this has decreased by -2% since the 2016 census. The disability rate for the town for Census 2022 was 19%, meaning that just under one in five people stated that they had a disability. This figure has increased significantly since the 2016, which found that 10% of people identified themselves as having a disability.

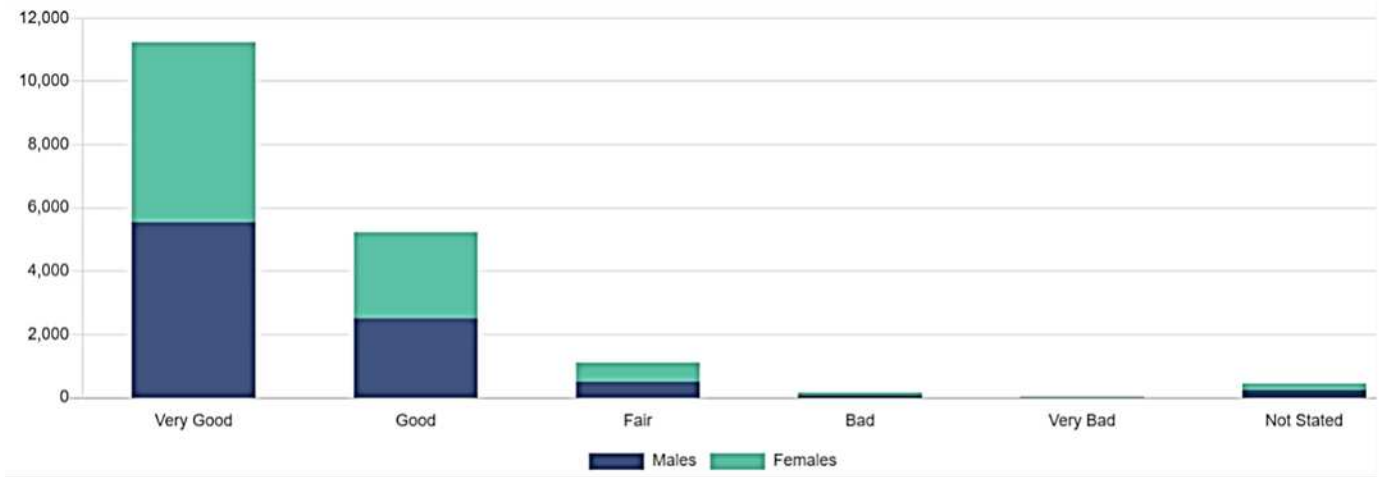


Figure 4.16 Health Status of Carrigaline Population as per Census 2022

4.5.11 Households

In 2022 a total of 6,047 households lived in the study area of Carrigaline, with the average household size being 3 persons. The average household size in Cork County Council is 2.72 people, which is slightly lower than the national average of 2.74 people according to Census 2022. While the number of households in Carrigaline increased since the 2016 Census, the average household size has remained the same.

Table 4-2 Census 2022, Proportion of Households by Size

Households	Study Area	County Cork	Ireland
1 person households	15.4%	22.9%	23.1%
2 person households	25.4%	27.6%	29.0%
3 person households	19.8%	17.2%	17.9%
4 person households	24.9%	18.0%	16.9%
5 person households	11%	10.1%	8.9%
6 person households	2.7%	3.1%	3.0%
7 person households	0.7%	0.7%	0.8%
8+ persons households	0.1%	0.3%	0.4%
Total households	100.0%	100.0%	100.0%

The study area of Carrigaline (15.4%) shows that there is a lower proportion of 1-person households compared to County Cork (22.9%) and Ireland (23.1%). This could suggest a relatively lower number of single-person residences, potentially due to a lack of demand. Carrigaline’s proportion of 2-person households (25.4%) is slightly lower than County Cork (27.6%) and Ireland (29.0%). With just over one in four households representing two-person households, this suggests that Carrigaline may have a balanced presence of couples or small family units without children or with grown children who have left home. Carrigaline’s percentage of 3- and 4-person households (19.8% and 24.9%) is higher than both County Cork (17.2% and 18.0%) and Ireland. This suggests that Carrigaline has more medium-sized families (typically two parents and two children) compared to County Cork and the national average.

It can be concluded that Carrigaline has a lower percentage of 1- and 2-person households compared to County Cork, but a higher proportion of 3- and 4-person households. This is possibly due to an ongoing demand for medium-size type households which are compatible and favourable to small-medium sized families, with Carrigaline being an attractive location for families with children. Although the percentage of 1- and 2-person households is on average lower in Carrigaline compared to Cork County and Ireland, together these households represent 40% of all households in Carrigaline, indicating that there is an opportunity to provide unit types which are tailored to these household sizes.

Carrigaline has a slightly higher number of larger households (5 or more persons) than both County Cork and Ireland This suggests a mix of household structures, possibly influenced by both the aging population and a presence of larger, settled family units in the town. The town's household distribution suggests that Carrigaline's community may be less varied in terms of family size than some other parts of the county or country.

4.5.12 Housing Delivery

The National Planning Framework – Project Ireland 2040 (NPF) was prepared and published by the Department of Housing and Local Government on behalf of the Government. The National Planning Framework, most commonly known as the NPF was established in tandem with Project Ireland 2040 in order to establish a policy and planning framework for the development of Ireland socially, economically and culturally.

One of the ultimate objectives of the NPF is to guide the future development of Ireland, considering a projected 1 million increase in the Country's population, the need to create 660,000 additional jobs to achieve full employment and a need for approx. 500,000 more homes by 2040.

The NPF requires delivery of a baseline of 25,000 homes annually to 2020, followed by a likely level of an average of 33,000 homes annually up to 2027. Within this output, 112,000 households are expected to have their housing needs met by social housing over the next decade. To achieve the objective of compact growth, 40% of future housing delivery is to be delivered within and close to the existing footprint of built-up areas.

Notwithstanding the above, it is acknowledged that the Census 2022 population data has indicated that there is more significant growth than the projections of the NPF anticipated and the first revision of the NPF is currently being undertaken to reflect the actual growth and upcoming needs.

The revised NPF has set out new draft national objectives in relation to housing targets with Draft National Policy Objective 43 stating its plan to target the supply of housing to accommodate approximately 50,000 additional households per annum to 2040.

According to the CSO, there were 30,330 new dwelling completions in the whole of 2024, a decrease of 6.7% from 2023 and below the 'Housing for All' target of 33,000. This is according to the New Dwelling Completions Q4 Report¹. According to the overall figures for 2024 dwelling completions, the number of scheme dwellings completed rose by 4.6% to 16,200 in 2024, and there was a slight decline of 2.2% to 5,367 in single dwellings completed in 2024. Among completions in 2024, 53.4% were scheme dwellings, 28.9% were apartments, and 17.7% were single dwellings.

The population and housing stock change for Carrigaline between the 2016 and 2022 Censuses are shown below.

¹ <https://www.cso.ie/en/releasesandpublications/ep/p-ndc/newdwellingcompletionsq42024/>

Table 4-3 Population and Housing in Carrigaline (Source: CSO)

Carrigaline	2016	2022	6-year-change
Total Population	15,770	18,239	15.7%
Housing Stock	5,219	6,051	15.9%

4.5.13 Tenure

Across Carrigaline, 76.7% of the housing stock is either owned outright (31.1%) or is owned with a mortgage or loan (45.6%). A total of 12.5% of households are rented from private landlords, while an additional 8% are rented from the Local Authority or from a Co-Operative Housing body. A small proportion of the population do not pay any rent for their accommodation. Figure 4.17 below shows the occupancy status of households in Carrigaline as per the 2022 Census.

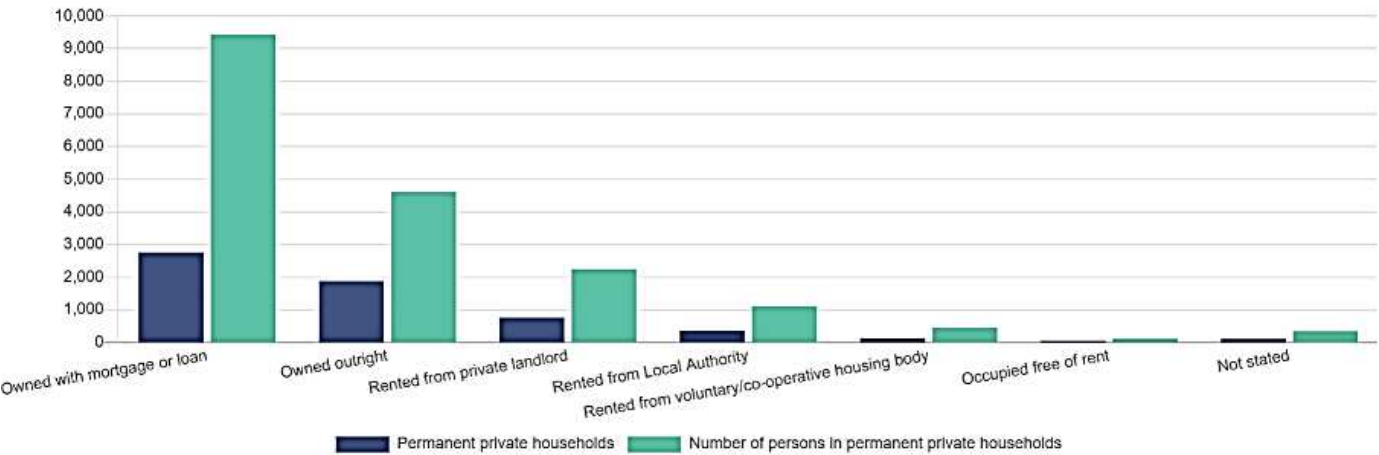


Figure 4.17 Occupancy Status of Households in Carrigaline (Source: Census 2022)

Between the 2016 Census and the 2022 Census, the occupancy information indicates that the proportion of outright owned properties increased during the inter-census period, with owner occupied with mortgage or loan's decreasing over the same time period.

4.5.14 Employment

The seasonally adjusted unemployment rate for December 2024 was 4.2%, raised from 4.1% in November 2024, and down from 4.5% in December 2023.

At present, the CSO produces a supplementary measure of unemployment in parallel with the routine Monthly Unemployment Estimate. The methodology for the Monthly Unemployment Estimates involves forecasting the number of unemployed persons using the trend in the recipient Live Register series. The Department of Social Protection provides Working Age Income support to people arriving in Ireland from Ukraine under the Temporary Protection Directive. The Live Register series includes recipients of these supports who have met the relevant criteria. This has impacted the numbers of unemployed, primarily females, in these monthly estimates. The CSO statistical release on monthly figures issued in January 2025 in respect of December 2024 stated the following:

“The seasonally adjusted number of people unemployed was 121,700 in December 2024, compared with 120,300 in November 2024. There was a fall of 3,900 in the seasonally adjusted number of people unemployed in December 2024 when compared with a year earlier.”

According to Census 2022 statistics, the unemployment rate for the town of Carrigaline was 5.5% at the time that the Census was recorded. According to the Census, of the population aged 15 or over, 61.1% were ‘at work’, while 13% were identified as ‘students’, with another 11% of the population identifying themselves as ‘retired’. An additional 7.1% indicated that they were ‘looking after home/family’. Of the 5.5% of the population of the town who identified themselves as being unemployment, over 50% of these people indicated that this was due to permanent sickness or disability. Figure 4.18 below outlines the Principal Economic Status of the population aged 15 years and over.

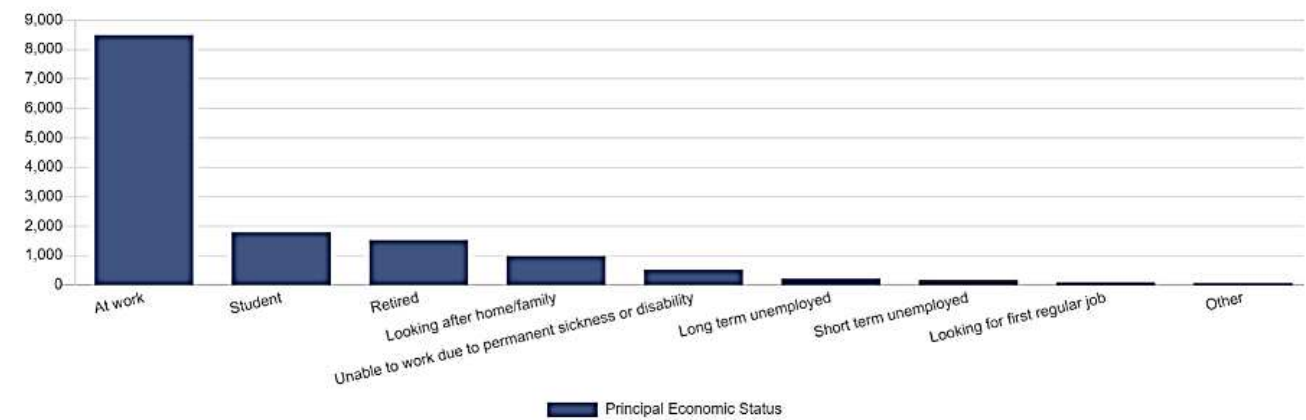


Figure 4.18 Principal Economic Status of Carrigaline population aged 15 years and over (Source: Census 2022)

Based on the 2022 census, 23.2% of the population in Carrigaline identified that they were working in a ‘Professional Occupation’. 15% identified their occupation status as ‘Associate Professional and Technical Occupation’, while 10.4% identified themselves as working in a ‘Skilled Trade’. Table 4.4 below details the Census 2022 statistics by social class in respect of occupation. As detailed in the table, on average, more people in Carrigaline identified their occupation as being ‘Managerial and Technical’ (34.9%) and ‘Professional’ (12.5%) compared to Cork County and national averages. While the number of those who identified their work as being ‘Unskilled’ (2.5%) was lower compared to both County and national figures.

Table 4.4 Social Class and Socio-Economic Group by Occupation (Source: CSO)

Status	Total	Total %	Cork County	Ireland
Professional workers	2283	12.5%	10.0%	9.3%
Managerial and technical	6361	34.9%	32.2%	30.7%
Non-manual	3148	17.2%	15.8%	16.2%
Skilled manual	2195	12%	14.4%	12.9%
Semi-skilled	2167	11.9%	12.1%	11.2%
Unskilled	437	2.5%	2.7%	3.1%
All others gainfully occupied and unknown	1648	9%	12.8%	16.6%
Total	18239	100%	100.0%	100.0%

4.5.15 Social Infrastructure

Social infrastructure includes a wide range of services and facilities, including education, health, community, cultural, play, faith, recreation and sports facilities that contribute to the quality of life. This planning application is accompanied by a **Childcare Demand Report (CDR)** and a **School Demand Assessment (SDA)**, which should all be read in conjunction with this chapter. In summary, these reports confirm that sufficient facilities are available in the area and that these facilities can adequately provide for the new population anticipated as part of this development. In addition, this Chapter details information on nearby healthcare, recreation and retail facilities in the area.

4.5.15.1 Education and Childcare

The Childcare Demand Report (CDR), which accompanies this application (under separate cover), has identified a total of 9 no. childcare facilities within the town of Carrigaline. The location of these providers, and their current available capacity, in the context of the site are shown in Table 4.5, with corresponding Figure.

Table 4.5 Existing Childcare Providers in Carrigaline (Source: McCutcheon Halley Planning Consultants)

No.	Service Name	Distance to Site (km)	Distance to Facility Drive Time	Capacity of Facility (Places)
1	Tots & Co. Childcare	1.8km	3 minutes	33
2	An Naionra Charrig Ui Leighin	2.8km	7 minutes	44
3	First Steps Pre-school	2.8km	7 minutes	42
4	Starting Point Montessori	3.5km	7 minutes	33
5	Little Einstein’s	3.3km	8 minutes	250
6	Heronswood Childcare Centre	3.7km	8 minutes	118
7	Heronswood Montessori	2.9km	6 minutes	22
8	The Shine Centre	3.5km	8 minutes	18
9	Ena’s Montessori	1.4km	3 minutes	N/A
Total				560

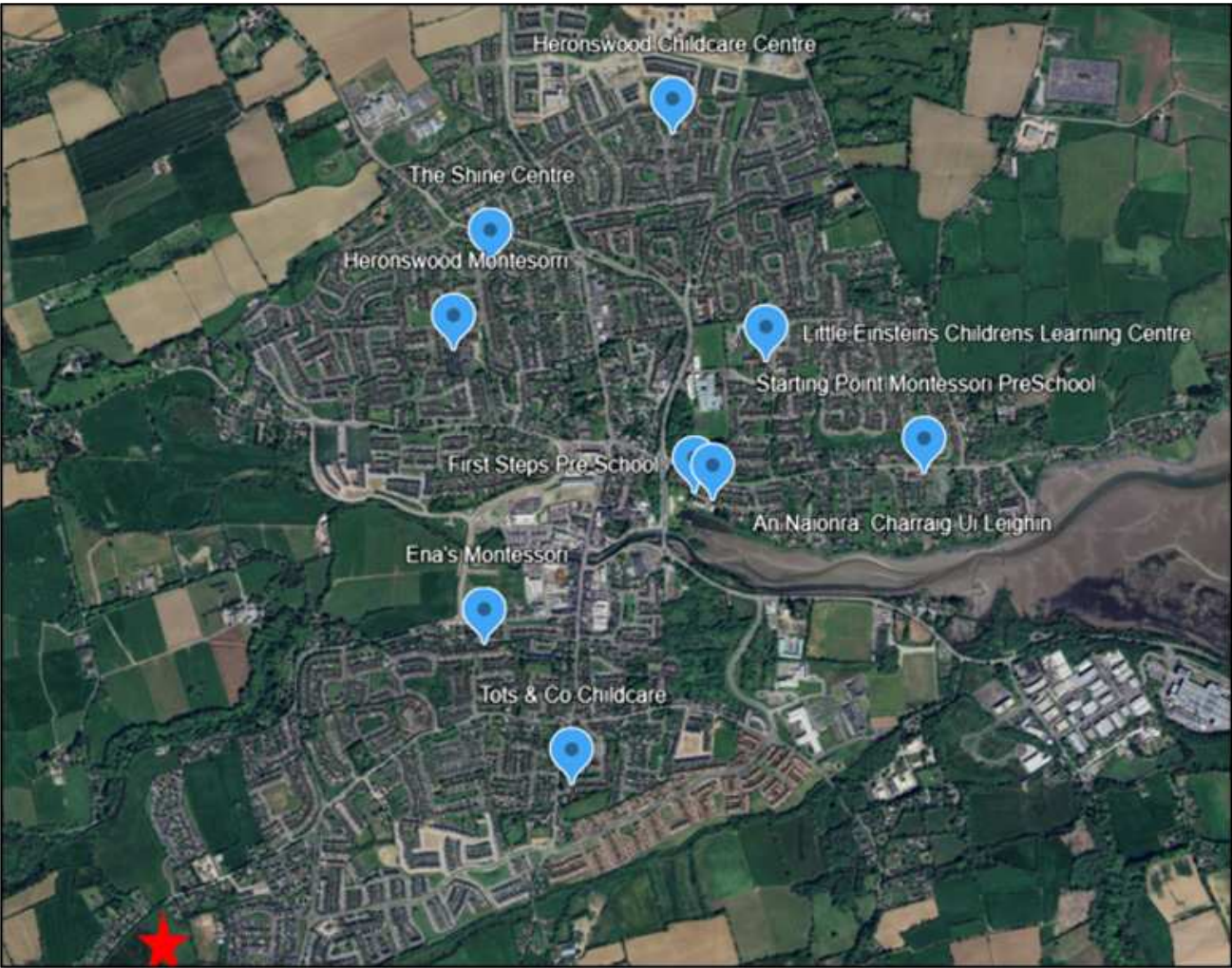


Figure 4.19 Location of Childcare Facilities within Carrigaline

4.5.15.2 Primary and Post Primary Schools

The School Demand Assessment (SDA) that accompanies the planning application has identified the primary and post primary which are available in Carrigaline. The SDA demonstrates that, based on the current enrolment figures (2024-2025) versus previous year enrolment figures, a decline in enrolment has occurred. The result shows that there are 5 no. primary schools, 2 no. special schools, and 3 no. post-primary schools located within Carrigaline, with an estimated capacity of 2,233 enrolments (see **Table 4.6**) and refer to Figure 4.20 for locations of primary schools.

Table 4.6 Existing Primary Schools and Special Schools in Carrigaline (Source: McCutcheon Halley Planning Consultants)

Official Name	Enrolments 2023/2024	Enrolments 2024/2025	Estimated Capacity
Holy Well N.S.	808	802	7
Owenabue Educate Together	63	91	3
Carrigaline Educate Together	457	442	2
St. Mary's N.S	207	209	2
Gaelscoil Charraig Uí Leighin	617	596	0
Sonas Special School	48	48	Not available
Carrigaline Community Special School	48	45	Not available
Total	2,248	2,233	14

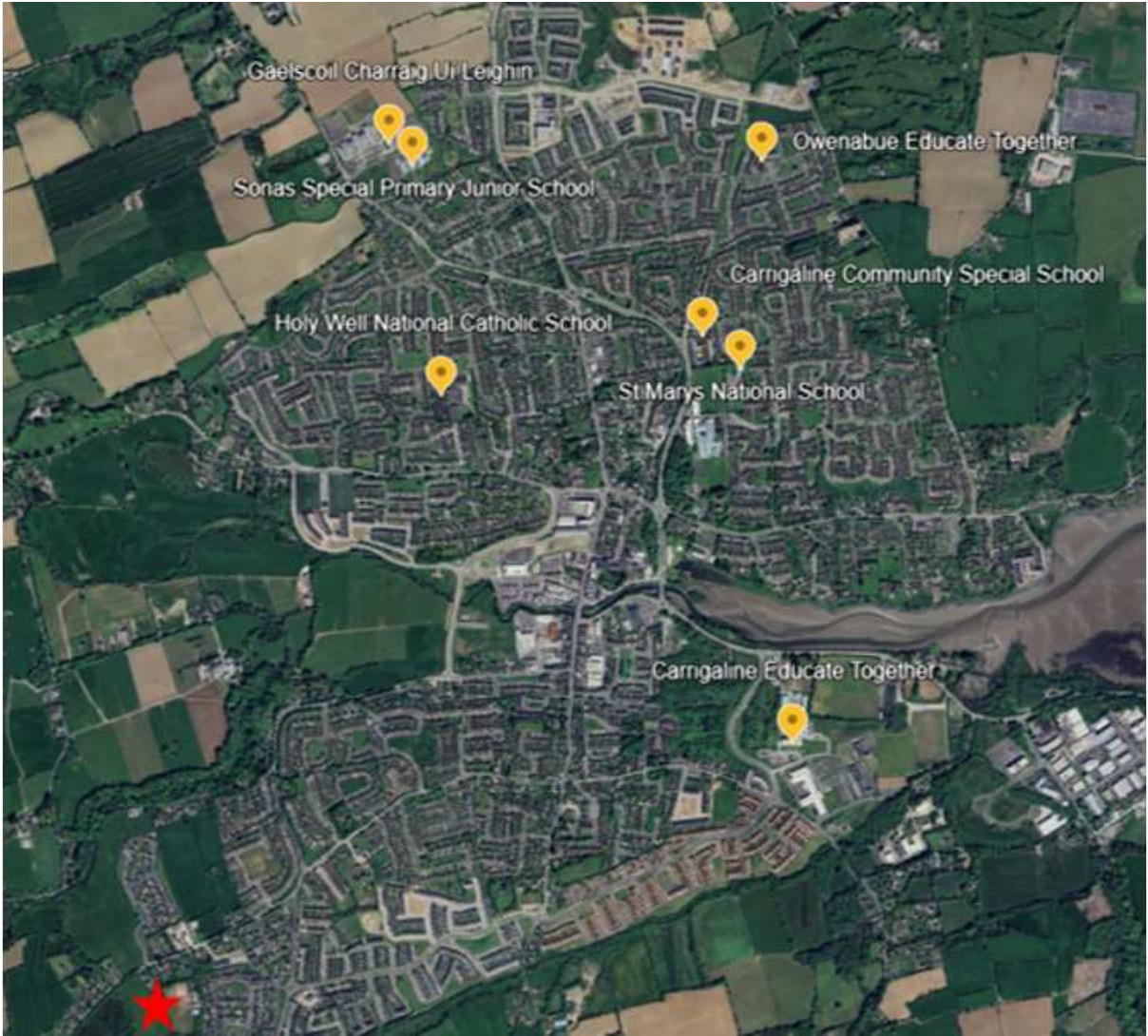


Figure 4.20 Location of Primary Schools in Carrigaline

In regard to Post-Primary education, SDR has identified 3 no. post-primary schools with a total capacity of 1,920, where 19 available spaces were identified (see **Table 4.7**) and refer to Figure 4.21 for locations of post-primary schools.

Table 4.7 Existing Post-Primary Schools in Carrigaline (Source: McCutcheon Halley Planning Consultants)

School Name	Enrolments 2023/2024	Enrolments 2024/2025	Estimated Capacity Per Year
Edmund Rice School	574	577	1
Carrigaline Community School	1,068	1,060	17
Gaelcholáiste Charrig Uí Leighin	255	283	1
Total	1,897	1,920	19

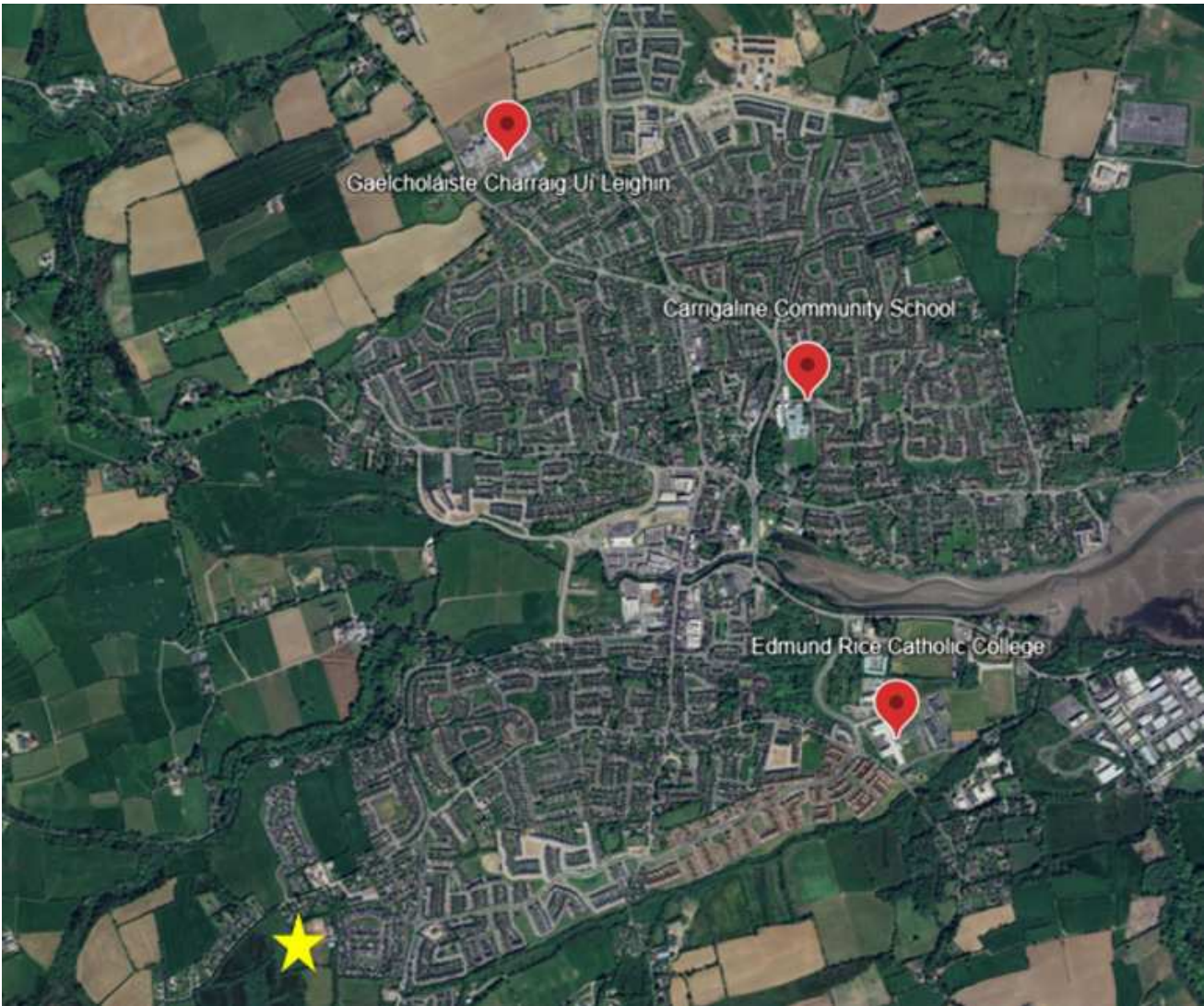


Figure 4.21 Location of Post-Primary Schools in Carrigaline

4.5.15.3 Health Services

There are 8 no. registered General Practitioners in Carrigaline, along with 5 no. pharmacies, 4 no. dentists and 1 no. Primary Care Centre. The location of these in the context of the development site are show on Figure 4.22 and Table 4.8.

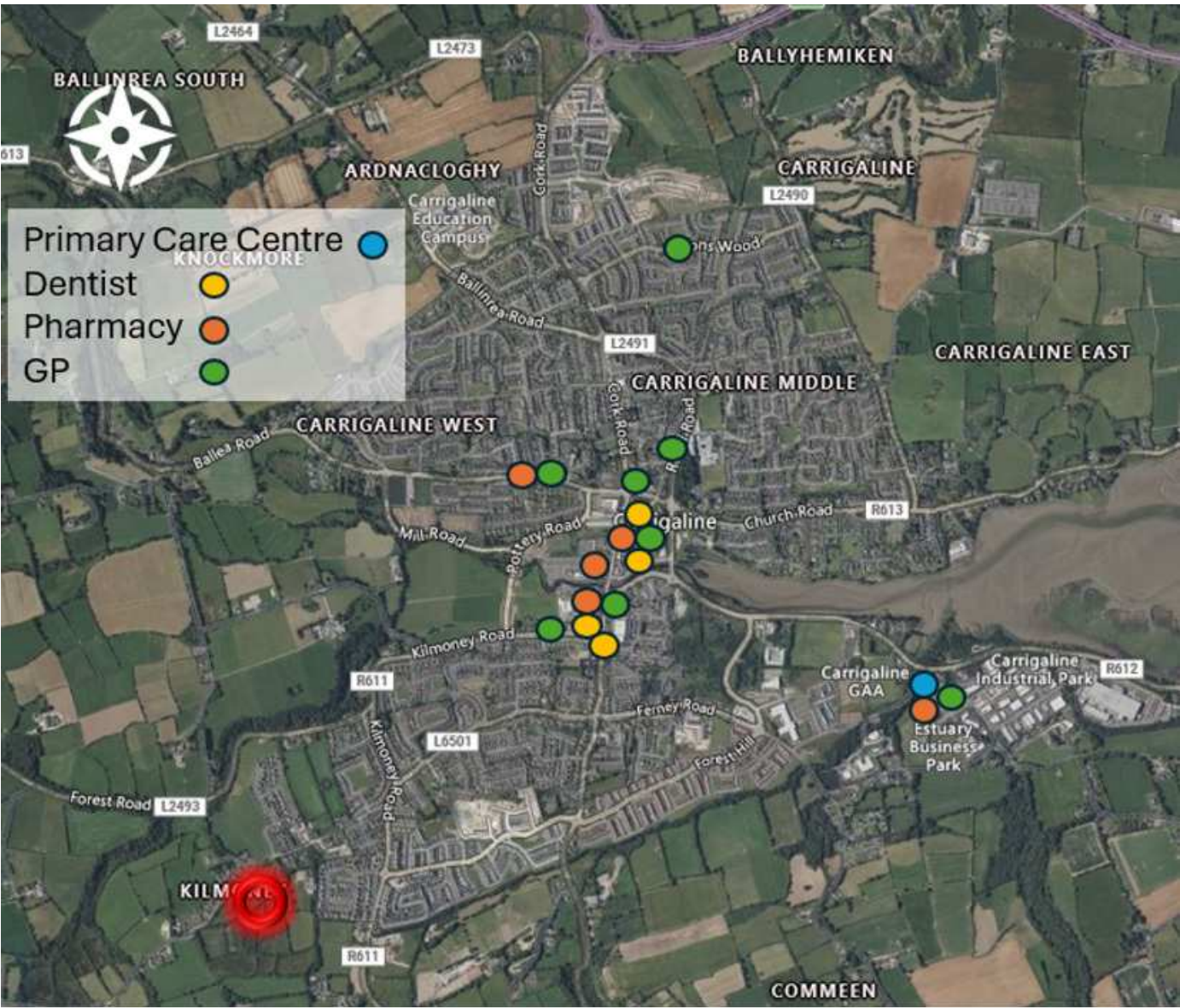


Figure 4.22 Healthcare Facilities in Study Area (Source: McCutcheon Halley)

Table 4-8 Medical Facilities in Study Area

No.	Primary Care Centre
1	Carrigaline Primary Care Centre
No.	General Practice
2	Bridge Medical Practice
3	Cantillon Surgery
4	Kilmoney Clinic
5	Carrigaline Medical Practice
6	Cork Road Medical Clinic
7	Owenabue Medical Centre
8	Carrig Medical Centre
9	Herons Wood Medical Centre
No.	Pharmacy
10	Careplus Pharmacy
11	Phelan's Pharmacy
12	Martin Walsh Pharmacy
13	Boots Pharmacy
14	O'Regan's Pharmacy
No.	Dentist
15	Church Hill Dental Practice
16	Carrigaline Dental Practice
17	Winning Smile Carrigaline
18	Peter O'Brien Orthodontics

4.5.15.4 Community and Amenity Services

There are a number of sporting and recreational facilities in Carrigaline which are available. These include local sporting organisations such as Carrigaline AFC and Carrigaline GAA, as well as Carrigaline playground and skatepark. There is also a very popular amenity walk which runs on an old railway line, between Carrigaline and Crosshaven. These facilities can cater for a variety of age groups, from young to old. Please refer to Figure 4.23 and Table 4.9

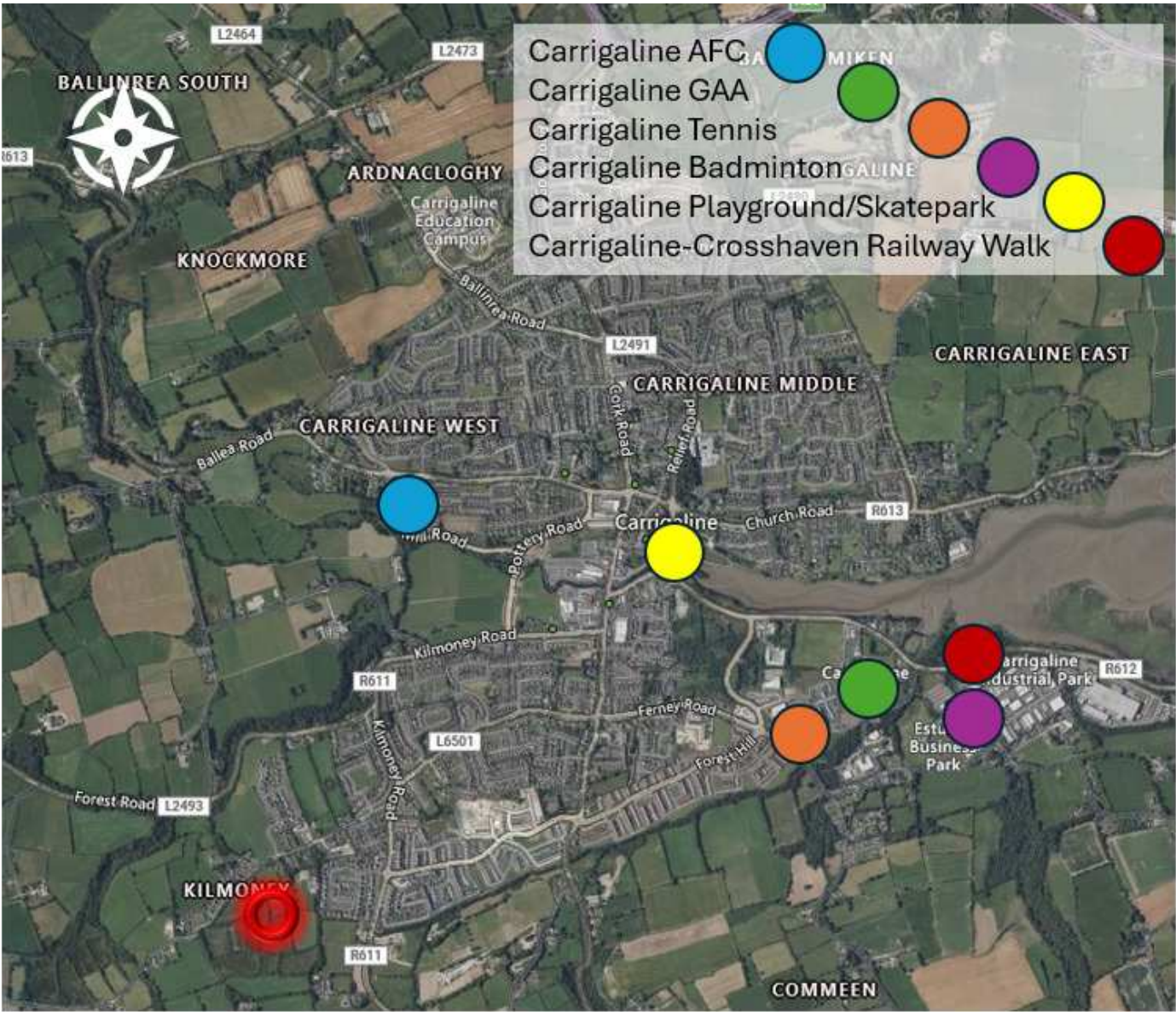


Figure 4.23 Sports and Recreational Facilities in Study Area

Table 4-9 Sports and Recreational Facilities in Study Area

No.	Facility
1	Carrigaline AFC
2	Carrigaline GAA
3	Carrigaline Tennis
4	Carrigaline Badminton
5	Carrigaline Playground/Skatepark
6	Carrigaline-Crosshaven Railway Walk

4.5.15.5 Retail and Convenience

There are a number of retail and convenience stores located in Carrigaline which will be available to future residents of the site. These range of large retail supermarkets, to small local convenience stores and service stations, providing people with a wide range of goods and services. Please refer to Figure 4.24 and Table 4.10 for details.

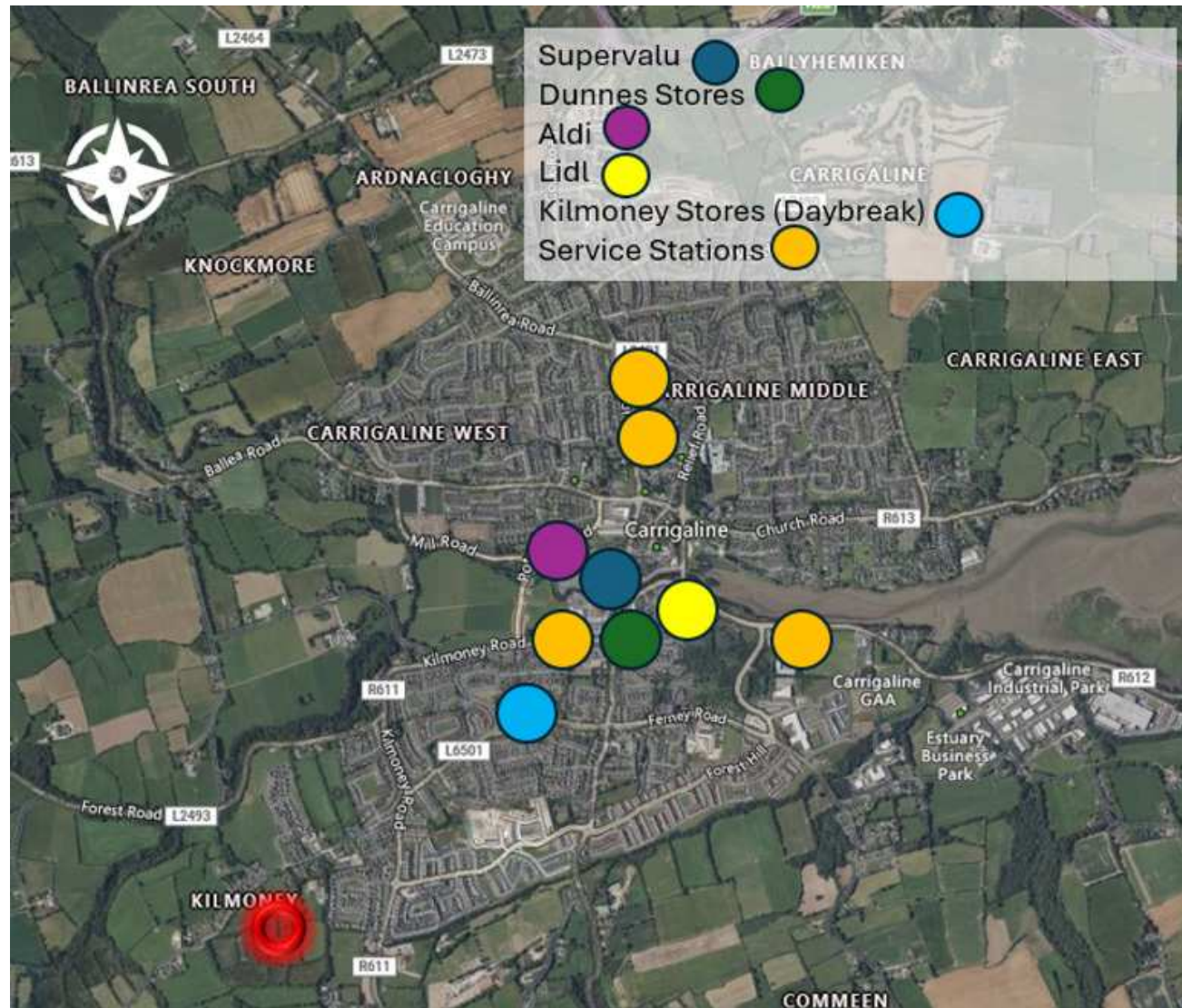


Figure 4.24 Retail and Convenience stores located in Carrigaline (Source: McCutcheon Halley Planning Consultants)

Table 4.10 Retail and Convenience Stores in Study Area

No.	Facility
1	Supervalu
2	Dunnes Stores
3	Lidl
4	Aldi
5	Kilmoney Stores (Daybreak)
6	Top Oil Service Station
7	Certa Service Station
8	Circle K Service Station
9	Maxol Service Station

4.6 The 'Do Nothing' Scenario

4.6.1 Actual Do Nothing

If the development were not to proceed there would be no immediate impact on the existing population, economic activity, or community services and facilities in the town. However, if the development does not occur there will be a shortfall in housing supply in the area which may negatively impact the continued sustainable growth of the town.

The site is zoned for residential development and the provision of housing on the subject site will support the core strategy and objectives of the Cork County Development Plan. If the development does not occur the zoning and objectives of the local planning policy will not be realised in the short term.

In terms of Population and Human Health, a 'do nothing' scenario (i.e., not developing the proposed development site) would represent a lost opportunity to develop these lands for residential use on a zoned site. As such, the proposed development site would remain underutilised, and it would not contribute to increasing the provision of housing in this area.

The impacts on land use are therefore envisaged to be negative to neutral for the 'do-nothing' scenario.

4.7 Difficulties Encountered

There were no difficulties encountered in preparing this chapter.

4.8 Consultation

Consultations with both the local authority and statutory bodies were also used to ensure that environmental issues, including socio-economic, recreational and amenity issues relating to the proposed development were addressed. Further information on the consultation process and responses received is provided in Appendix 1.1

4.9 Impact Assessment

This section describes the environmental effects that are likely to arise during the construction and operation of the proposed development. Section 4.10 sets out the mitigation measures required to alleviate identified effects.

Potential Impacts are considered under the following headings in line with the Guidelines set out in section 4.10:

- Population
- Employment and Economics
- Health
- Residential Amenity
- Local Amenity Impacts

Specific effects with respect to matters such as air quality, noise, traffic, visual impact etc. are dealt with in the respective assessments in this EIAR.

4.9.1 Construction Phase

The potential impacts of the proposal during the construction phase of the development are outlined below. The construction phase is expected to last approximately 60 months, as per the Outline Construction Management Plan (OCEMP) submitted with the application, under separate cover, by OSL Consulting Engineers.

4.9.1.1 Population

The construction phase is not likely to result in any changes to the settlement patterns as described in Section 4.58.

The potential impacts arising during the construction phase relate to short term impacts to quality of life, including visual impact/amenity, noise, air quality, and transport. Where relevant, these impacts have been considered in the relevant chapters of the EIAR and will be minimised or mitigated where appropriate. It is unlikely that these impacts will be of a scale to either encourage people to move from the area or discourage people from moving to the area.

The construction phase may result in short term negative impacts on the local population.

4.9.1.2 Employment & Economics

The construction phase is anticipated to result in a temporary boost to the local economy as workers employed at the site can be expected to make use of local retail facilities and other services. If the application is successful, construction works will continue until the development is completed. Up to 100 workers will be employed on site during the construction phase, and there will be positive economic externalities to industries that are complimentary to the construction sector.

It is anticipated that the construction phase of the project will result in likely positive short term moderate effects locally and within the wider Carrigaline area.

4.9.1.3 Health

As with any construction site, there will be potential risk to health and safety in terms of injury or death of construction personnel on-site due to the usage of large, mobile machinery as well as heavy equipment and materials.

Human health may be impacted on in a variety of ways and by several environmental receptors including water, biodiversity, climate, flooding, air, and major accidents, etc. Exposure to contaminants or pollutants can have serious implications for human health. Potential impacts on population and human health include inadequate water and wastewater infrastructure, contamination of soils, excessive noise, flooding due to non-control of surface water, poor air quality in areas where there are large volumes of traffic, and the health impacts associated with the storage of hazardous materials during the construction stage. These issues are addressed within the relevant discipline of the EIAR.

4.9.1.4 Residential Amenity

The anticipated likely significant effects in the absence of mitigation on residential amenities relate to disruption due to increased construction traffic movements on the local road network, noise, dust and visual impact arising from plants (e.g. cranes) necessary to deliver the development.

In the absence of mitigation, the construction phase may result in short term negative impacts on the local population.

4.9.1.5 Local Amenity Impacts

The construction phase is not anticipated to impact on the local amenity of the area. The development site is not located in direct proximity to local amenity facilities in Carrigaline, such as parks, playgrounds or clubs. Therefore the construction stage of the project is unlikely to result in any negative impact to local amenity.

Specific potential for effects on residential amenities during the construction phase is dealt with in this EIAR under the more specific chapters, such as Landscape & Visual, Air Quality, Built Services & Waste, Traffic & Transportation, Noise & Vibration and Risk Management chapters.

4.9.2 Operational Phase

Due to the nature of the development, there will be few hazards associated with the operational phase of the project and therefore no potential significant negative impact in terms of health and safety.

4.9.2.1 Population

The proposed development will deliver 362 no. residential units including 72 no. units that will be provided for the purposes of Part V Social Housing.

The total estimate development yield for the proposed development containing 362 units of which 161 are 2-bedroom units, 155 are 3-bedroom units, and 46 are 4-bedroom units is 945 no. persons, based on figures contained within Census 2022 for Carrigaline. The development yield has been broken down into three population types;

- Children aged 0-4
- Primary School Aged Population (5-12 year olds); and
- Post-Primary School Aged Population (13-18 year olds).

Table 4.11 Expected Population Yield by Age

Yield	Age Group 0-4 (	Age Group 5-12 (Primary School)	Age Group 13-18 (Post Primary)	Age Group 18 +
Catchment Based Yield	65	135	94	651

The proposed development includes the provision of a childcare provider which is capable of accommodating 102 childcare places. Based on the childcare yield of the development, this childcare provider will sufficiently meet the demand created by the proposed development. The location of the creche within walking distance development is considered likely to result in significant, positive, long-term, impacts on population and settlement patterns in the area.

4.9.2.2 Employment & Economy

There will be an economic benefit to local businesses during the operational phase. The proposed development includes for the provision of a creche, community room and café, all of which are likely to generate employment opportunities, boosting the community and local economy. Moreover, residents will use local facilities and services, and it is anticipated that the additional population will result in increased business for the wider community and Carrigaline, and will have a positive, slight, long-term impact on the services including dentist clinics, pharmacies, banks, and various retail outlets.

4.9.2.3 Health

The proposed development will not result in any significant negative impacts to the health and wellbeing of the existing population. In particular, the design of the scheme ensures that future residents of the local environment will benefit from the development, in the form of open spaces and amenity areas.

The potential impacts on cycling and pedestrians will be positive, given the additional infrastructure provided. A lack of adequate recreation or amenity facilities has the potential to negatively impact human mental and / or physical health. The proposed layout provides for excellent public amenity and recreational facilities.

The provision of these amenity facilities within the proposed development will be of benefit to future residents and existing residents in the local environs. The operational phase of the proposed development, in terms of recreation and amenity facilities will, therefore, have a permanent significant positive impact on Human Health.

4.9.2.4 Residential Amenity

During the operational phase, the high-quality living environment of the proposed scheme will result in positive impacts on amenity for future residents. Achieving a high-quality living environment through an integrated and balanced design approach will have a locally significant, positive and permanent effect on residential amenity.

Future residents will enjoy a combination of private and public amenity spaces, which allow for privacy and interaction and inclusion, helping to foster a sense of community within the neighbourhood. Open spaces will be overlooked ensuring sufficient passive surveillance. This is determined to have a positive effect on residential amenity.

The proposed development at operational stage will result in traffic movements that are naturally associated with residential neighbourhoods.

4.9.2.5 Local Amenity Impacts

The proposed development provides high quality public open space. The public open space is conveniently located in different character areas of the development to ensure that all residents find these spaces accessible. The woodland area located at the centre of the site is linked via internal footpaths to the wider neighbourhood, again ensuring that this space is accessible to all future residents. The proposed development also provides links with proposed infrastructure, notably Part 8 Cork County Council works along the R611 and allows for a potential future pedestrian access eastwards of the site, to help facilitate connectivity with the Greenway on the Crosshaven Road. This will result in a significant positive permanent effect on local amenity, especially for those who currently use the network of existing greenway routes in the surrounding area. The improvements made to the local road and footpath infrastructure will also have a positive impact on existing residents in the local environs.

The Social Infrastructure Audit, submitted with the application, demonstrates that there is a good variety of infrastructure within the catchment area. The proposed development site incorporates dedicated play areas within the public open space areas, as detailed in the Landscape Plan provided under separate cover. The proposed development also includes a childcare facility, community room and a café unit. The impact is deemed to have a locally positive, slight, and permanent effect.

As outlined previously, there are a number of healthcare associated facilities within Carrigaline, including GP services, pharmacies, dentists and a Primary Care Centre. These existing facilities and services may be utilised by future residents and continue to support the local economy.

As discussed in further detail above, the School Demand Assessment, submitted with the application, demonstrates that there are a number of both primary and post-primary schools in the Carrigaline area. Moreover, although not featured within the scope of this assessment, there are schools in nearby towns such as Crosshaven and Ballygarvan at primary level, and post-primary in Crosshaven and Cork City which offer additional alternatives for school age children.

The School Demand Report notes that enrolment projection figures provided by the Department of Education show that nationally both primary and post-primary enrolments are set to reduce considerably between 2020 and 2036. Based on these projections and the current available capacity within existing schools in Carrigaline, as outlined in the Report, the expected enrolments to be generated by the proposed development, over a phased basis, will be accommodated for.

Accordingly, the impact is deemed **locally neutral** with a significance that, at worst, would have a **moderate effect**.

In relation to the Childcare Report submitted with the application, while there are a number of existing childcare providers within the town, these providers do not currently have sufficient capacity to cater for the number of childcare places likely to be generated by the proposed development. As a result, the proposed development also proposes the construction of an 102-place creche, which is more than capable of accommodating the number of places to be generated by the development, which according the report is 38. The proposed development will therefore have a **slight, positive, and long-term** effect on the demand for pre-school places.

4.9.3 Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period or concentrated in a location. Cumulative effects can occur where a proposed development results in impacts that, when considered in combination with impacts of other proposed or permitted plans and projects may result in a cumulative effect.

As noted above there is potential for the construction phase of the proposed development to overlap with the construction of recently permitted developments in Carrigaline (as listed in Chapter 1 of this EIAR) which would increase the potential impacts on

human health and population. During the operational phase, the cumulative impact of these applications is expected to be slight, long-term impact and positive by providing additional homes, childcare facilities, community spaces, and public open spaces for the local population.

4.10 Mitigation Measures

4.10.1 Incorporated Design Mitigation

The proposed development complies with the Building Regulations which provide for the safety and welfare of people in and about buildings. The Building Regulations cover matters such as structure, fire safety, sound, ventilation, conservation of fuel and energy, and access, all of which safeguard users of the buildings and the health of occupants.

The proposed design provides for the segregation of pedestrians and bicycle traffic from motorised traffic. The design also incorporates the principles of universal design and the requirements of Part M of the Building Regulations so that the development will be readily accessible to all, regardless of age, ability or disability.

An assessment of the potential effects of the construction and operation of the proposed scheme in relation to climate forms part of Chapter 13 Air Quality & Climate of this EIAR. The assessment found that any impacts would be insignificant.

The integration of energy efficient measures into the design will provide for healthier living standards for future occupants, less dependence on fossil fuels and associated improved air quality. The availability of on the doorstep public open space, amenity spaces, and a highly accessible layout across the scheme will encourage sustainable modes of outdoor access for a wide age group.

4.10.2 Construction Phase Mitigation

An Outline Construction and Environmental Management Plan (CEMP), Outline Resource Waste Management Plan (RWMP) and Operational Waste Management Plan (OWMP) for the proposed development are included in the planning application documentation. The CEMP, RWMP & OWMP will be further updated by the contractor, agreed with Cork County Council prior to commencement, and implemented by the selected contractor after any consent is received.

All construction personnel will be required to understand and implement the requirements of the CEMP and RWMP and shall be required to comply with all legal requirements and best practice guidance for construction sites.

The CEMP provides for a construction phase management structure to ensure that environmental protection and mitigation measures are put in place. The CEMP requires that these measures will be checked, maintained to ensure adequate environmental protection. The CEMP also requires that records will be kept and reviewed as required to by the project team and that the records will be available on site for review by the planning authority.

All construction personnel will attend induction and training classes as required to ensure that the CEMP is effectively implemented. The CEMP will comply with all appropriate legal and best practice guidance for construction sites.

A full summary of construction phase mitigation measures are presented in Chapter 17 of this EIAR.

4.10.3 Operational Phase Mitigation

The proposed development is of a high quality design that incorporates generously sized units with integrated energy efficiency measures and an abundance of open space. The impact assessment section did not identify likely significant negative environmental impacts on population and human health arising from the operational phase of the proposed development. Accordingly, mitigation measures are not proposed.

4.11 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

The land will have an urban character for residential and mixed-use rather than greenfield site. The residual effect of the proposed development for population and human health is determined to be significantly positive having regard to the delivery of much needed new homes in a location that has the carrying capacity in terms of both services and amenities to support the population generated by the scheme.

The proposed mitigation measures will avoid, prevent, reduce impacts on the human environment during the construction and operational phases of the proposed development, where no significant adverse residual effect have been identified.

4.12 Interactions

Interactions are considered in Chapter 16 of this EIAR.

4.12.1 Material Assets: Traffic and Transport

There is potential risk from traffic related incidents which may arise, including an increase in pollutants which may affect air quality. In the current assessment, traffic derived pollutants which may affect air quality and thus population and human health have not been deemed as significant.

4.12.2 Land and Soils

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 standards and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers.

4.12.3 Material Assets: Waste

The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers.

4.12.4 Water and Hydrology

Pollution events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water control measures will be implemented as part of the Proposed Development.

Appropriate industry standard and health and safety legislative requirements will be implemented during the demolition and construction phase of the Proposed Development that will be protective of site workers.

The Proposed Development will increase the amount of people in close proximity to flood-prone areas. This increased population density could heighten the potential for flood-related health impacts, particularly during construction. Residual risk will be mitigated by monitoring weather forecasts to optimize construction planning.

4.12.5 Noise and Vibration

The Noise and Vibration chapter has been prepared in consideration of and in conjunction with the relevant elements of this chapter. For example, noise and vibration impacts associated with the Proposed Development have been fully considered within this Chapter of the EIA Report. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the proposed development.

4.12.6 Air Quality and Climate

Interactions between air quality and population and human health have been considered as the proposed development has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the proposed development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as having an overall insignificant impact, therefore air quality impacts from the proposed development are not expected to have a significant impact on population and human health.

4.12.7 Demolition Phase

4.12.7.1 Landscape & Visual

During the demolition phase of development, which consists of the removal of 3 no. agricultural farm sheds on the site, described in further detail in Chapter 2, the demolition processes and use of equipment to remove the sheds may give rise to visual impacts.

4.12.7.2 Noise & Vibration

There is potential for effects on human health associated with noise during the demolition phase which may impact upon amenity of existing nearby residents.

4.12.7.3 Air Quality

There is potential for impact on human health from dust associated with demolition activities and thus impacting air quality.

4.12.8 Construction Phase

4.12.8.1 Landscape & Visual

Construction processes and plant such as cranes used during the construction phase may give rise to visual impacts.

4.12.8.2 Traffic & Transport

Increased construction traffic movements on the local road network during the construction phase may give rise to noise, dust, and road safety impacts.

4.12.8.3 Built Services & Waste

Excavation during the construction phase may give rise to risks to human health from the improper removal, handling and storage of waste.

4.12.8.4 Noise and Vibration

There is potential for effects on human health associated with noise during the construction phase which may impact upon amenity.

4.12.8.5 Air Quality

There is potential for impact on human health from dust associated with construction activities and thus impacting air quality.

4.12.9 Operational Phase

4.12.9.1 Landscape & Visual

The landscape plan will impact the quality of the private, communal and public open spaces, which could impact people's health and well-being.

4.12.9.2 Traffic & Transport

The proposed development's proximity to services, amenities, and public transport would interact with patterns of traffic and transport locally during the operational phase. Traffic flows within the site have the potential to create safety risks for pedestrians and cyclists.

4.12.9.3 Air Quality & Climate

Energy efficient design within the proposed development may give rise to reduced electricity consumption by future residents, potentially decreasing dependence on fossil fuels for energy generation, resulting in significant CO2 savings. There is potential for impact on human health from a deterioration in air quality associated with emissions from vehicles.

The potential significant effects on population and human health arising from these interactions have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant permanent residual negative effects will occur.

4.12.10 Cumulative Residual Effects

The proposed development, in combination with the recently permitted development in Carrigaline will have a cumulative positive impact on the area.

4.13 Risk of Major Accidents or Disasters

The potential of major risks and disasters as a result of the proposed development has been assessed and the findings are presented in Chapter 15 of this EIAR.

No risk of major accidents and disasters has been identified. The project comprises a mixed use development on a greenfield site. All possible risks relating to existing soil contamination, potential flooding and construction activities have been considered and mitigation measures proposed where appropriate.

4.14 Worst Case Scenario

In the event that all mitigation measures fail to hinder potential negative impacts, the possibility of an increase of traffic within the surrounding roads and junctions of the site can occur. Further, without these mitigation measures in place, noise caused by the construction of the proposed scheme may increase and can cause a disturbance to any residential dwellings in close proximity to the site. Further, when mitigation measures are not considered, there is the possibility of the impact on dust that can be carried throughout the site. Dust can expand beyond the site and create adverse effects on the neighbouring environment, including the neighbouring residential dwellings. However, it is imperative that 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.

4.15 Monitoring

Measures to avoid negative impacts on Population and Human Health are largely integrated into the design and layout of the proposed development. Compliance with the design and layout will be a condition of any permitted development.

No specific monitoring is proposed in relation to this section. Monitoring of standard construction mitigation measures as outlined in this EIAR will be undertaken by the appointed contractor.

4.16 Conclusion

There are no significant adverse effects with respect to socio-economic factors, land use, or the amenity value potential of the area. Issues which may cause risks and hazards during the construction and operational phase of the development are given due consideration. All necessary mitigation measures will be put in place to ensure the health and safety of all site personnel and neighbouring properties. All other environmental aspects relating to the human environment which could have an adverse effect on the local population such as soils, geology & hydrogeology, water and ecology have been addressed in the relevant chapters of this EIAR.

4.17 References and Sources

- National Planning Framework, Ireland 2040 – Our Plan (Government of Ireland, 2018)
- Draft Revised National Planning Framework;
- Southern Regional Spatial and Economic Strategy 2019-2031;
- Cork County Development Plan 2022-2028;
- Sustainable Urban Housing: Design Standards for New Apartments (Guidelines for Planning Authorities) (Department of Housing, Local Government and Heritage, 2023);
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 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 (EPA, 2022);
- Social Infrastructure Audit, MHP 2025;
- School Demand Assessment Report, MHP 2025;
- Childcare Demand Report, MHP 2025;
- Construction Environmental Management Plan (OSL 2025)
- Central Statistics Office (CSO) website www.cso.ie;
- Department of Education (DE) website <https://www.gov.ie/en/organisation/departments-of-education/>;
- Pobal website <https://maps.pobal.ie/>; and
- Health & Safety Authority <https://hsa.ie/eng/>.

CHAPTER FIVE

LANDSCAPE AND VISUAL



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER FIVE

Table of Contents

Landscape and Visual

- 5.1 Introduction 5-1
- 5.2 Expertise & Qualifications 5-1
- 5.3 Proposed Development 5-1
- 5.4 Methodology 5-1
- 5.5 Difficulties Encountered..... 5-4
- 5.6 Description of Existing Environment..... 5-5
- 5.7 Predicted Impacts 5-7
- 5.8 The ‘Do Nothing’ Scenario 5-11
- 5.9 Potential Significant Effects 5-12
- 5.10 Mitigation Measures 5-13
- 5.11 Residual Impact Assessment 5-13
- 5.12 Risk of Major Accidents or Disasters 5-13
- 5.13 Interactions..... 5-13
- 5.14 Monitoring 5-13
- 5.15 Summary of Mitigation and Monitoring 5-13
- 5.16 Conclusion 5-13
- 5.17 References and Sources 5-13

Table of Tables

Table 5-1 Significance of Landscape and Visual effects based on
Magnitude and Sensitivity..... 5-2

Table 5-2 Impact Classification Terminology taken from EPA (2022)
Guidelines on the Information to be Contained in Environmental
Impact Assessment Reports 5-3

Table of Figures

Figure 5-1 - Zone of Theoretical Visibility (ZTV) using Digital Terrain
Model (DTM) 5-6

Figure 5-2 - Zone of Theoretical Visibility (ZTV) using Digital Surface
Model (DSM) 5-6

Figure 5-3 – Receptor map 5-7

CHAPTER FIVE | Landscape and Visual

5.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on landscape and visual impact. Other effects of lower significance have been included in this assessment to better inform the decision-making process.

This chapter should be read in conjunction with the architectural and landscape architectural plans and verified photomontages produced by external consultants as well as the Biodiversity and Cultural Heritage chapters of this report for references to and descriptions of relevant designations.

5.2 Expertise & Qualifications

JBA Consulting Engineers and Scientists Ltd has been commissioned to prepare a Landscape and Visual Impact Assessment (LVIA) for the Large Residential Development at Carrigaline, Co. Cork. This chapter was prepared by Lukas Kazlauskas (Assistant Landscape Architect) and Maria Inês Timóteo (Senior Landscape Architect) and reviewed by Christos Papachristou (Principal Landscape Architect).

Lukas holds a bachelor's degree in landscape architecture and a master's degree in urban planning & design with University College Dublin. He has assisted in drafting LVIA reports and processing GIS mapping data for a number of infrastructure developments in Ireland. Maria holds a master's degree in landscape architecture. She is a Corporate Member of the Irish Landscape Institute (MILI) and has led and carried out numerous standalone and EIAR LVIA reports. Christos holds a MA in Landscape Architecture and a MSc in Agricultural Engineering and Biotechnology. He is a Chartered Member of the Landscape Institute (CMLI) in the UK and Corporate Member of the Irish Landscape Institute (MILI). Christos has carried out LVIAs and been involved in the preparation of LVIAs for EIARs as well as standalone in Ireland and the UK.

The team has carried out Landscape and Visual Impact Assessments and been involved in the preparation of EIARs for the following projects:

- Barrow Canal, for proposed improvement works within Co. Carlow, Co. Laois and Co. Kildare
- Brownsbarn Citywest LRD, SDCC
- BusConnects Galway, Co. Galway
- Carpark development at the Rock of Dunamase, Co. Laois
- Dunboyne LRD Phase 1 & Phase 2, Co. Meath
- Kilkee Flood Relief Scheme, Co. Clare
- Mallow Castletlands Large Residential Development, Co. Cork
- N3 Virginia Bypass, Co. Cavan
- Residential development in Raitnechan, Co. Wicklow
- Warehouse development in Tay Lane, SDCC

5.3 Proposed Development

The full description of the proposed development is outlined in Chapter 2 'Development Description' of this EIAR.

The proposed development consists of the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

5.3.1 Aspects Relevant to this Assessment

This assessment will consider elements of other disciplines that contribute to the landscape character of the areas surrounding the site. These relate heritage sites such as protected structures, as well as built and natural heritage (refer to Chapter 15 for Cultural Heritage & Archaeology assessments).

5.4 Methodology

5.4.1 Assessment Methodology

The Landscape and Visual Impact Assessment in the EIAR takes into consideration aerial photography, emerging design drawings, relevant publications, and reports, together with visits to the site and environs of the proposed development. The Assessment is carried out in accordance with:

- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports;
- Guidelines for Landscape and Visual Impact Assessment (GLVIA) as published by the Landscape Institute (UK) and the Institute of Environmental Management and Assessment (3rd Edition, 2013); and
- Cork County Draft Landscape Strategy, 2007, Cork County Council
- Cork County Development Plan 2022-2028; Cork County Council

Verified photomontages in accordance with the GLVIA guidance are included in Appendix 5.1 to facilitate the assessment of visual impacts. The locations for the photomontages have been agreed following liaison with the local planning authority.

The landscape and visual amenity chapter examines the potential effects of the proposed development on views of receptors within the Zone of Theoretical Visibility including residential properties and nearby open spaces, in terms of visual intrusion and visual obstruction. It also examines the impact on the landscape character from the permanent physical changes to the site brought about by the development.

5.4.1.1 Landscape Impact Assessment Criteria

When assessing the potential impacts on the landscape resulting from a proposed project, the following criteria are considered:

- Landscape character sensitivity;
- Magnitude of likely impacts; and
- Significance of landscape effects.

5.4.1.2 Sensitivity of the Landscape

The sensitivity of a landscape is the degree to which it can accommodate changes or new elements without unacceptable detrimental effects to its essential characteristics. Landscape Character Areas (LCAs) are landscapes that share essential characteristics.

Landscape Sensitivity, often referred to as 'value', is classified using the following criteria which have been derived from a combination of industry guidelines from the Landscape Institute for Landscape and Visual Impact Assessment and professional judgement.

- **Very high** - Areas where the landscape character exhibits a very low capacity for change in the form of development. Examples of which are very high value landscapes, protected at an international level e.g., World Heritage Site, where the principal management objectives are likely to be protection of the existing character;
- **High** - Areas where the landscape character exhibits a low capacity for change in the form of development. Examples of which are high value landscapes, protected at a national level e.g., National Park, where the principal management objectives are likely to be protection of the existing character;
- **Medium** - Areas where the landscape character exhibits a medium capacity for change in the form of development. Examples of which are medium value landscapes, protected at a Local or Regional level e.g., Open space areas mentioned within a County Development Plan, where the principal management objectives are likely to be protection of the existing character;
- **Low** - Areas where the landscape character exhibits a high capacity for change and has very few or no designated landscapes or open space areas; and
- **Neutral** - Areas of landscape character that include derelict, mining, industrial land or are part of the urban fringe where there would be a reasonable capacity to embrace change or the capacity to include the development proposals. Management objectives in such areas could be focused on change, creation of landscape improvements and/or restoration to realise a higher landscape value.

5.4.1.3 Magnitude of Likely Landscape Impacts

The magnitude of a predicted landscape impact is a product of the scale, extent or degree of change that is likely to be experienced as a result of the proposed project. The magnitude takes into account whether there is a direct physical impact resulting from the loss of landscape components and/or a change that extends beyond the boundary of the proposed project that may have an effect on the landscape character of the area.

- **Very high** - Change that would be large in extent and scale with the loss of critically important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality;
- **High** - Change that would be more limited in extent and scale with the loss of important landscape elements and features, that may also involve the introduction of new uncharacteristic elements or features that contribute to an overall change of the landscape in terms of character, value and quality;
- **Medium** - Changes that are modest in extent and scale involving the loss of landscape characteristics or elements that may also involve the introduction of new uncharacteristic elements or features that would lead to changes in landscape character, and quality;
- **Low** - Changes affecting small areas of landscape character and quality, together with the loss of some less characteristic landscape elements or the addition of new features or elements;
- **Neutral** - Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable;
- **Neutral** - Changes that do not involve the loss of any landscape characteristics or elements and will not result in noticeable changes to the prevailing landscape character; and
- **Positive** - Changes that restore a degraded landscape or reinforce characteristic landscape elements.

5.4.1.4 Significance of Landscape Effects

The significance of the landscape impact will be the combination of the sensitivity of the landscape against the magnitude of the change. It is summarized in Table 5-1 below.

Table 5-1 Significance of Landscape and Visual effects based on Magnitude and Sensitivity

Magnitude	Sensitivity				
	Very high	High	Medium	Low	Negligible
Very high	Profound	Very significant	Significant	Moderate	Slight
High	Very significant	Significant	Moderate	Slight	Slight
Medium	Significant	Moderate	Slight	Slight	Imperceptible
Low	Moderate	Slight	Slight	Imperceptible	Imperceptible
Negligible	Slight	Slight	Imperceptible	Imperceptible	Imperceptible
Neutral	Imperceptible	Imperceptible	Imperceptible	Imperceptible	Imperceptible
Positive	Positive	Positive	Positive	Positive	Imperceptible

5.4.1.5 Sensitivity of Visual Receptors

Unlike landscape sensitivity, the sensitivity of visual receptors has an anthropocentric (or human-centric) basis. It considers factors such as the perceived quality and values associated with the view, the landscape context of the viewer, the likely activity they are engaged in and whether this heightens their awareness of the surrounding landscape.

Visual receptors most susceptible to changes in views and visual amenity are:

- **Very high** - Residents in properties within protected landscapes and travellers on a Scenic route where awareness of views is likely to be heightened;
- **High** – Residents in properties with predominantly open views from windows, garden or curtilage. People, whether residents or visitors, who are engaged in outdoor recreation including use of public rights of way, whose attention or interest is likely to be focused on the landscape and on particular views, and those on a scenic route where the view is not specifically in the direction of the proposed development;
- **Medium** - Visitors to heritage assets, or to other attractions, where views of the surroundings are an important contributor to the experience, and communities where views contribute to the landscape setting enjoyed by residents in the area.
- **Low** - People engaged in outdoor sport or active recreation on a local scale, which does not involve or depend upon appreciation of views of the landscape; and people at their place of work whose attention may be focused on their work or activity, not their surroundings and where the setting is not important to the quality of working life, and people travelling in vehicles where their view is limited to a few minutes at any viewpoint; and
- **Neutral** - Changes affecting restricted viewpoints.

5.4.1.6 Magnitude of Visual Impacts

The magnitude of a visual effect is determined on the basis of several factors: the relative numbers of viewers, the distance from the viewpoint, the visual dominance of the proposed development within a view and its effect on visual amenity, as follows:

- **Very high** - The proposal intrudes into a large proportion or critical part of the available vista and is without question the most noticeable element. A high degree of visual clutter or disharmony is also generated, strongly reducing the visual amenity of the scene;
- **High** - The proposal intrudes into a significant proportion or important part of the available vista and is one of the most noticeable elements. A considerable degree of visual clutter or disharmony is also likely to be generated, appreciably reducing the visual amenity of the scene;
- **Medium** - The proposal represents a moderate intrusion into the available vista, is a readily noticeable element and/or it may generate a degree of visual clutter or disharmony, thereby reducing the visual amenity of the scene. Alternatively, it may represent a balance of higher and lower order estimates in relation to visual presence and visual amenity;
- **Low** - The proposal intrudes to a minor extent into the available vista and may not be noticed by a casual observer and/or the proposal would not have a marked effect on the visual amenity of the scene; and
- **Neutral** - The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.

Magnitude can also be described as:

- **Neutral** - Changes that are not discernible within the available vista and have no bearing the visual amenity of the scene; and
- **Positive** - Changes that enhance the available vista by reducing visual clutter or restoring degraded features.

5.4.1.7 Visual Impact Significance

As stated above, the significance of visual impacts is a function of visual receptor sensitivity and visual impact magnitude. This relationship is expressed in the same significance matrix as used earlier in respect of landscape effects, see Table 5-2.

5.4.1.8 Impact Classification Terminology

Table 5.2 overleaf presents the Impact Classification Terminology as published in the EPA guidance document (EPA, 2022). Standard definitions are provided in this glossary, which permit the evaluation and classification of the quality, significance, duration and type of impacts associated with a proposed development on the receiving environment.

Each impact is described in terms of its quality, significance, extent, duration & frequency and type, where possible.

Table 5-2 Impact Classification Terminology taken from EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports

Impact Characteristics	Term	Description
Quality of Effects	Positive	A change that improves the quality of the environment
	Neutral	No effects or effects that are imperceptible, within normal bounds of variation within the margin of forecasting error.
	Negative/Adverse	A change that reduces the quality of the environment.
Significance of Effects	Imperceptible	An effect capable of measurement, but without significant consequences.
	Not significant	An effect which causes noticeable changes in the character of the environment, but without significant consequences.
	Slight	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 most of a sensitive aspect of the environment.
	Profound	An effect which obliterates sensitive characteristics.
Extent and Context of Effects	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.
Probability of Effects	Likely	The effects that can reasonably be expected to occur because of the planned project, if all mitigation measures are properly implemented.
	Unlikely	The effects that can reasonably be expected not to occur because of the planned project, if all mitigation measures are properly implemented.
Duration and Frequency of Effects	Momentary	Effects lasting from seconds to minutes.
	Brief	Effects lasting less than a day.
	Temporary	Effects lasting less than a year.
	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
	Frequency	Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, monthly, annually)

Impact Characteristics	Term	Description
Types of Effects	Indirect/ Secondary)	Impacts on the environment, which are not a direct result of the project, often produced away from the project site or because of a complex pathway.
	Cumulative	The addition of many minor or significant effects, including effects of other projects, to create larger, more significant effects.
	‘Do-Nothing’	The environment as it would be in the future should the subject project not be carried out.
	‘Worst case’	The effects arising from a project in the case where mitigation measures substantially fail.
	Indeterminable	When the full consequences of a change in the environment cannot be described.
	Irreversible	When the character, distinctiveness, diversity or reproductive capacity of an environment is permanently lost.
	Residual	The degree of environmental change that will occur after the proposed mitigation measures have taken effect.
	Synergistic	Where the resultant effect is of greater significance than the sum of its constituents.

5.4.1.9 Cumulative Impact Assessment

The cumulative effect of a set of developments is the combined effect of all the developments taken together.

Cumulative effects on visual amenity consist of combined visibility and sequential effects.

Combined visibility occurs where the observer is able to see two or more developments from one viewpoint.

- Combined visibility may either be in combination (where several developments are within the observer’s arc of vision at the same time) or in succession (where the observer has to turn to see the developments).
- Sequential effects occur when the observer has to move to another viewpoint to see different developments. For example, this could be when travelling along roads or paths. The occurrence of sequential effects may range from frequently sequential (the features appear regularly and with short time lapses between, depending on speed of travel and distance between the viewpoints) to occasionally sequential (long time lapses between appearances, because the observer is moving very slowly and / or there are large distances between the viewpoints).

Cumulative landscape effects affect the physical fabric or character of the landscape, or any special values attached to the landscape.

- Cumulative effects on the physical fabric of the landscape arise when two or more developments affect landscape components such as woodland, dykes or hedgerows. Although this may not significantly affect the landscape character, the cumulative effect on these components may be significant – for example, where the last remnants of former shelterbelts are completely removed by two or more developments.
- Cumulative effects on landscape character arise from two or more developments. Housing developments introduce new features into the landscape. In this way, they can so change the landscape character that they can create a different landscape character type. That change need not be negative; some derelict or industrialised landscapes may be enhanced as a result of such a change in landscape character. The cumulative effects on landscape

character may include other changes, for example trends or pressures for change over long time periods, which should form part of any consideration of a particular project.

5.4.2 Relevant Legislation & Guidance

The landscape assessment undertaken is made with regard to the sensitivity of the landscape and its ability to undergo change. The methodology is based on national and local policy guidelines and best practice methodology as outlined in the references below:

- Guidelines on Landscape and Visual Assessment (2002); Irish Landscape Institute (ILI)
- Guidelines for Landscape and Visual Impact Assessment (GLVIA), third edition (2013), Landscape Institute (UK)
- Guidelines on Information to be Contained in Environmental Impact Assessment Reports (2022); Environmental Protection Agency (EPA)
- Environmental Impact Assessment of Projects: Guidelines on the Preparation of the Environmental Impact Assessment Report (EIAR) (2017); European Commission
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013); European Commission
- Guidelines on Landscape and Landscape Assessment (2000); Department of the Environment, Community and Local Government
- National Landscape Strategy 2015-2025; Department of the Environment, Community and Local Government
- National Biodiversity Action Plan (2023-2030)
- Cork County Development Plan 2022-2028; Cork County Council

In addition to the above documents, Ordnance Survey and National Monuments Service historical maps were used to help identify past land uses, landscape components and historic landscape evolution.

5.4.3 Site Surveys/Investigations

A site visit was carried out in August 2024. The site visit involved the verification of nearby views from the initial desk-based study and observations of the site and wider landscape for the purposes of the impact assessment. Field notes were recorded in relation to topography, land use, significant landscape features and overall landscape character.

5.4.4 Consultation

Consultation with Cork County Council was carried out to agree on the locations of verified photomontages. Eight (8 No.) locations were proposed. These were selected to cover the views of mainly sensitive receptors within the close visual envelope of the proposed development where there was a higher probability of impacts of higher significance. These are shown in Appendix 5.1.

5.5 Difficulties Encountered

The site visit took place during daytime, and as a result no night-time views were observed. This is not expected to be required as no significant light nuisance is expected outside the site boundary. Time restrictions allowed for surveys to only take place in summer when full foliage on trees provides additional screening. The level of screening seen on site will therefore be lower during winter. The assessment has accounted for winter views. Finally, private properties were not accessed during the site visit. Views from private properties were instead approximated to the best possible publicly accessible viewpoint.

Photography for the verified photomontages has been carried out from locations where the dominant views are best represented with a focus on the average to worst case scenario. This is to conclude with more certainty on the level of significance of the visual impacts deriving from the proposed development. Where this was not possible due to visual obstructions and/ or unsafe site conditions, the next preferred location has been selected to adequately demonstrate the potential visual impacts.

5.6 Description of Existing Environment

5.6.1 Receiving Environment – Site Context

Carrigaline is located 13 km south of Cork City and is separated from the city suburbs by an open greenbelt. It is situated at the mouth of Owenabue River and at the head of the estuary which forms part of the Cork Harbour. The landscape is dominated by gently rolling hills to the south of the town, and the town itself is characterised as a metropolitan town with a unique setting and history.

The proposed development site is situated within the townland of Kilmoney, Carrigaline, Co. Cork. To the south and west the majority of land use is a mix of greenfield and agricultural lands, with a ribbon of residential estates and individual one-off dwellings along Mountain Road. Carrigaline urban fabric is located to the east, with estates such as Wheatfields and Abbey Lane immediately adjacent to the existing site.

Main roads that run alongside the proposed development are Mountain Road to the north, as well as R611 regional road circa 236 metres to the east. The wider context includes the developed residential section of Kilmoney townland to the east, and Carrigaline to the northeast. The landscape to the north, west and south is composed of agricultural lands, with individual one-off houses and farmyards throughout.

The topography of the proposed development site is generally flat at an average of 57m Above Ordnance Datum (AOD), in a landscape that slopes towards the north. Hills at approximately 165 and 155m are located to the south, whereas Owenabue River in Carrigaline is situated at c. 5m AOD.

The River Owenabue runs through Carrigaline, northeast of the proposed site 1.34km away. Streams are shown to branch away from the main river, with some streams located near the proposed site within a radius of approximately 400m.

5.6.2 Landscape Character

According to the Cork County Development Plan 2022-2028 (CDP) and Draft Landscape Strategy 2007 (LCA), the proposed development site is located within the landscape character type 6a – Broad Fertile Lowland Valleys (Blarney-Ballincollig-Carrigaline-West to Dunmanway). The landscape is described as comprising shallow and flat valleys contributed by the Owenabue river valley.

The landcover includes highly fertile, regularly shaped fields typically of medium size and with mature broadleaf hedgerows. Main uses of these landcovers include intensive dairying, agriculture and tillage. Both the landscape value and sensitivity are 'High', and importance rated as being of 'County' level.

There are no designated architectural conservation area or protected structures within the proposed development site.

Along the site boundary to the north, west and south lies the metropolitan green belt. This identifies a transition zone from urban to rural. Its zoning objectives focus on amenity and recreation. The proposed development occupies a part of both the urban and greenbelt zones. The site is within an area zoned for new residential development as per the Cork CDP. The objectives of the CDP for the metropolitan greenbelt are to prevent urban sprawl and ensure a clear distinction between urban and rural landscape. It preserves the wider setting of the town and surrounding green landscape and ensure compact and orderly development.

5.6.3 Receiving Environment – Site

The proposed development site currently comprises agricultural fields with grasslands, enclosed and separated by mature tall hedgerows and trees. These dense hedgerows sit on top of drainage ditches separating fields. The centre of the site includes a patch of dense deciduous woodland. The existing vegetation is made up mostly of native species, mainly willow (*Salix* spp.) and hawthorn (*Crataegus monogyna*).

The topography of the site is relatively flat, sloping gently towards the northeast. The highest point is located on the south-westernmost corner at approximately 62m AOD, and the lowest elevation is located on the northern boundary at circa 52 m AOD.

5.6.4 Zone of Theoretical Visibility

The Zone of Theoretical Visibility (ZTV) was produced to inform this assessment. The ZTV shows the areas that the proposed development could be visible from locations in the surrounding landscape. Typically, the ZTV is produced based on a bare earth scenario. That is where existing built environment and vegetation is not taken into consideration. The ZTV will inform the extents of the study area for the assessment of visual impacts. The radius that is considered needs to be proportional to the height and extents of the proposed development. For developments of similar size to the proposed, an area covering 2km around the proposal is generally accepted as a proportionate approach.

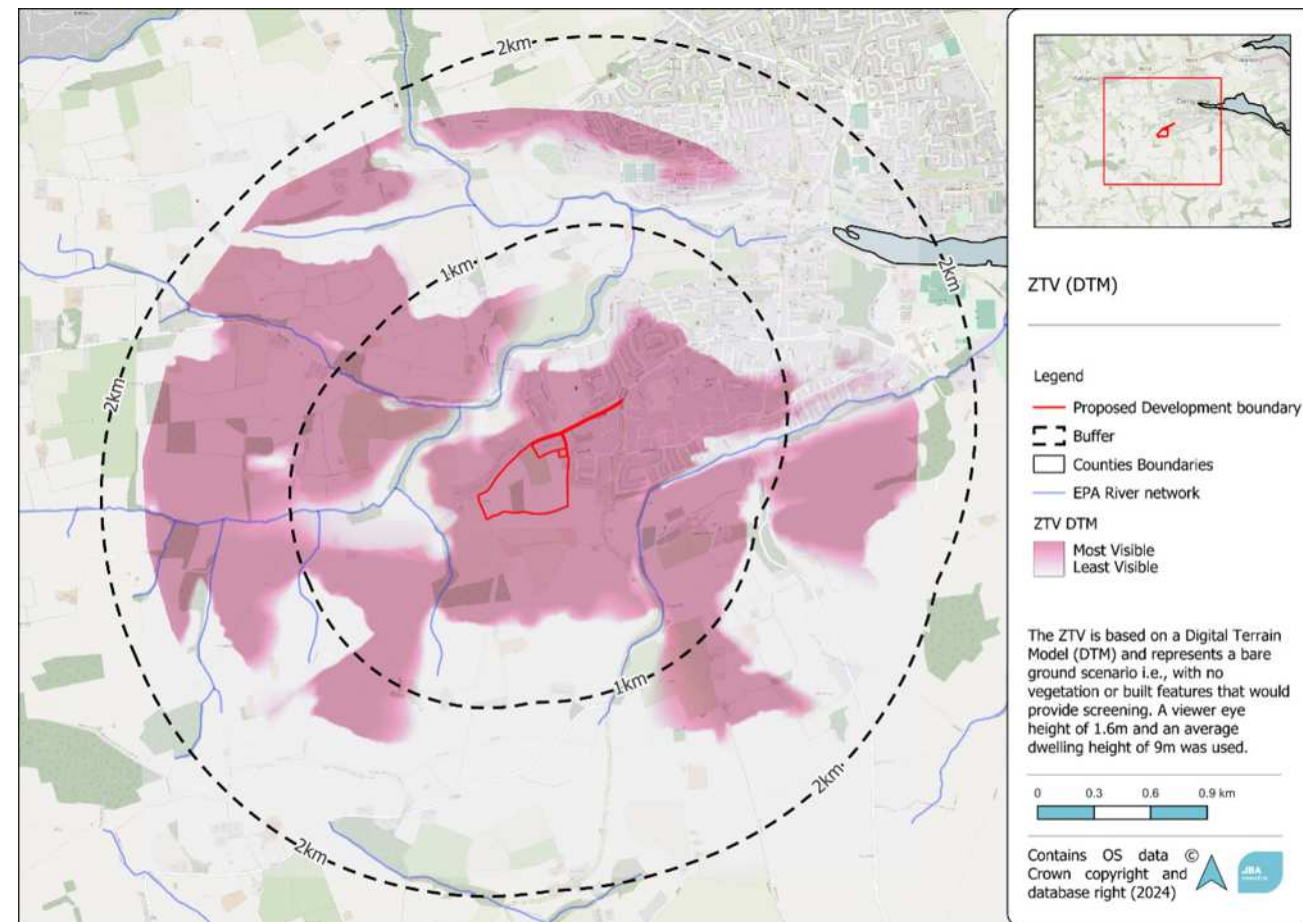


Figure 5-1 - Zone of Theoretical Visibility (ZTV) using Digital Terrain Model (DTM)

The ZTV shown in Figure 5-1 above, was used to identify the areas where receptors that are more likely to be visually impacted by the proposed development are located.

For the purpose of assessment, a separate ZTV was produced using a Digital Surface Model (DSM). This is different to the DTM as it includes data relating to the existing built environment and vegetation. This DSM-based ZTV is shown below in Figure 5-2 and highlights the areas where the proposed development is expected to be visible. Receptors identified within the DSM-based ZTV are expected to have more direct views to the proposed development.

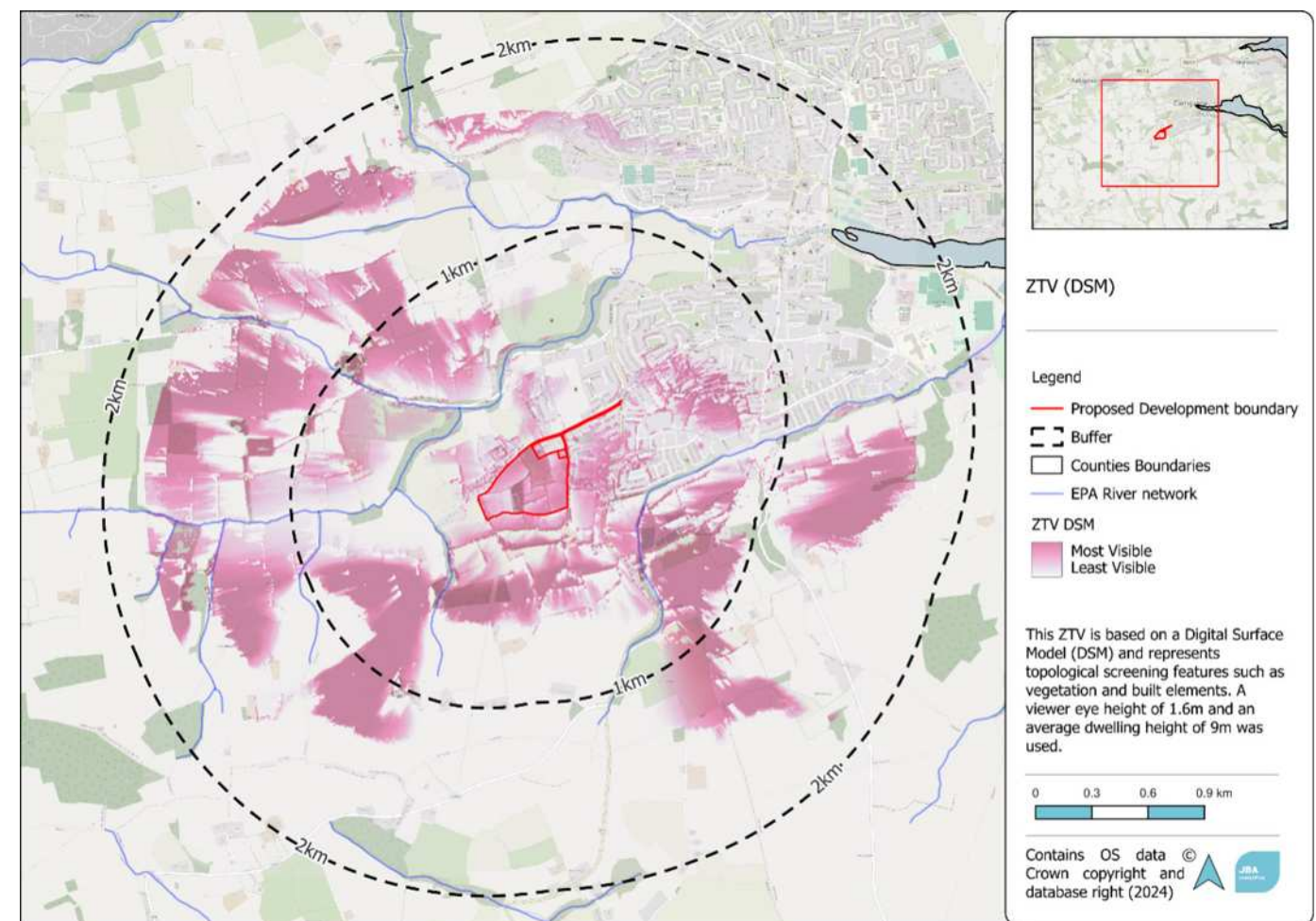


Figure 5-2 - Zone of Theoretical Visibility (ZTV) using Digital Surface Model (DSM)

5.6.5 Landscape Context

The landscape of Kilmoney, Carrigaline, around the proposed development is predominantly agricultural. It comprises grasslands with mixed sized fields surrounded by tall mature hedgerows. Unlike the generally rural setting, the landscape changes to more urban to the north and east, where residential estates and individual houses are sited. Carrigaline is recognised as one of five Main Towns in the Ballincollig Carrigaline Municipal District. It holds a strategic location just off the N28 road, providing direct connections to Cork City 15km to the north and Ringaskiddy, a major port and industrial area. The metropolitan green belt separates Carrigaline from the city suburbs. Mountain Road runs along the northern boundary of the site.

There are thirteen (13no.) national monuments located within 1km of the proposed development site. This includes standing stones, ringforts, enclosures and souterrains. The National Inventory of Archaeological Heritage also identifies two buildings within 1km, Kilmoney House and Kilmoney Bridge. The feature located closest to the development is a ringfort approximately 250 metres northeast, which is sited within a private enclosed field.

5.6.6 Views & Prospects

There are no protected views and prospects, or scenic routes inside or within 1km of the proposed development site. There are scenic walks within 2km north of the site along Ballea Woods and the river Owenabue, but the views are directed away from the proposed development site.

5.7 Predicted Impacts

Predicted Impact Assessment

As described in the methodology, the impacts to the landscape and visual amenity will be assessed based on the sensitivity of the receptor and magnitude of change. This assessment as part of an EIAR will be focusing on potential significant and profoundly significant impacts and secondarily on impacts of lower significance.

Receptor groups were identified during the initial desktop investigation using aerial imagery and verified on site during the site visit. Receptors were grouped in terms of function, i.e., residential buildings, community buildings, etc., and location. See Figure 5-3 for the 'Visual Receptor Plan' which shows the identified receptor groups. These receptor groups are discussed below with an assessment of the effects on their visual amenity.

Eight verified photomontages have been produced, as included in Appendix 5.1, showing the perceived view of a receptor overlooking towards the direction of the proposed development. This provides information of what the receptors could see if the site were to be implemented.

Impact Duration was considered permanent if a receptor had a distinct alteration to the horizon line or if views of a structure would continue to remain visible. During assessment, the landscape was also considered in the context of permanency. For example, retained mature trees were considered permanent, with management and evolution.

Type of Impact was considered positive only if the proposals contribute to the character of the locality and would not be detrimental to the rural setting. A negative *Type of Impact* might occur if for example, the proposal removed large sections of the hedgerows which was required to make space for roadway but would reduce the character of the landscape.

5.7.1.2 Landscape

The landscape Character Assessment (LCA) for the Cork County Development Plan 2022-2028 describes the landscape character the site is within as a "Broad Fertile Lowland Valley" with its main urban centres being Carrigaline, Ballincollig, and Bandon. Main pressures faced within this area include a particular increase of population within these towns, incentivizing on more housing developments. This is especially prevalent within the Eastern sections of the landscape type such as Carrigaline and Ballincollig. Key characteristics of the landscape include traditional A-frame housing which are well screened by hedgerows, and mosaic-like fields for agricultural use, usually medium in size. There is a rich amount of National Inventory of Architectural Heritage (NIAH) areas within this landscape reflecting the strong agricultural wealth of the LCA. There are no designated monuments or protected structures within the proposed development site. Monuments located within the study area are within private property.

The location of the proposed development is within the fringe of Carrigaline, east of the Kilmoney Road. It is expected to promote sustainable development of the fringe of Carrigaline by protecting the existing natural assets of hedgerows within the area as well as providing new trees along the boundaries after operations. Sections of existing hedgerows and tree lines are expected to be removed to open access roads into the proposed development site.

According to the methodology and taking account to the proposed design, the overall impact to the landscape is expected to be *temporary, slight to moderate, negative* during construction phase to *permanent, slight, negative* during operational phase.

5.7.1.3 Visual

Receptor groups were identified during initial desktop surveys using aerial imagery and verified on site during site survey visits. Receptors were grouped in terms of function, ie. Residential, commercial, community, town centre, etc. See Figure 5-3 for the receptors mapped around the development site. These receptor groups are further described below in terms of the predicted effects of the development site on their visual amenity.

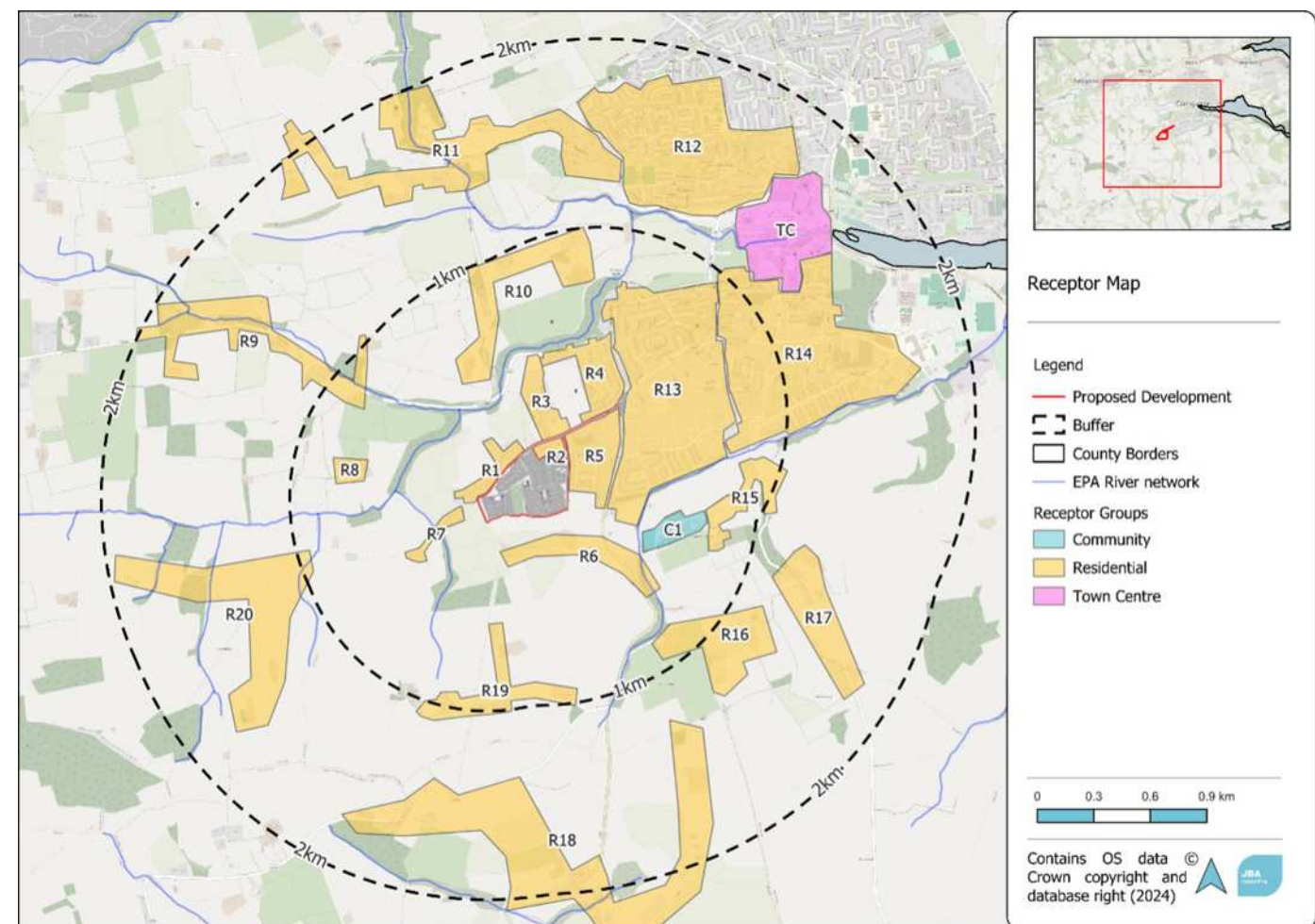


Figure 5-3 – Receptor map

There are no designated monuments or protected structures within the proposed development site. Monuments located within the study area, within receptor groups R4, R10, R11, R12, R13, R14, R17, R18, R19, R20, TC and environs are within private ownership and generally not open to the public. The proposed development is not expected to be visible from existing monuments and structures within the urban fabric, due to screening provided by the intervening topography, built environment and mature mixed vegetation.

5.7.2 Receptor Descriptions

The visual effects for the receptors identified in Figure 5-3 are described in section 5.7.2.1 below for the operational phase. The assessment for construction phase is included where visual effects are expected to be higher than *temporary, slight, negative*, and is not included for effects that are likely to be reversible or of lower significance.

5.7.2.1 Residential receptors

R1 (Immediately northwest from the site) A large linear group of single-storey dwellings located next to the Mountain Road to the north / northwest. Sizes of front and rear gardens are large, with primary views facing the southeast directly towards the development. Each dwelling is surrounded by dense evergreen vegetation, with much of the views limited to the carriageway.

The visual effects from this receptor group are represented in a verified photomontage, as included in Appendix 5.1 (View 01).

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude Current views towards the development are screened by the receptors' evergreen boundary vegetation and the hedgerow along the proposed development site boundary. That vegetation is expected to be largely removed. Where vegetation is expected to be removed along the northern boundary of the site, additional tree planting is proposed in conjunction with a new boundary wall and hedge. Primary views from this receptor group are towards the site. Partially filtered views of the proposed development are expected due to the existing hedges along the private boundaries. Where receptors include reduced screening elements, the proposed development is expected to be visible. Therefore, in accordance with tables Table 5-1 and Table 5-2 the magnitude of change would therefore be *medium to low*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would therefore be *temporary, moderate, negative* during construction due to the removal of the existing mature hedgerow and tree line along the northern boundary of the proposed development, and *permanent, slight, negative* during operation with the potential to be reduced as the proposed vegetation reaches maturity.

R2 (Immediately west from the site) A linear group of six single to two-storey dwellings located next to Mountain Road. Primary views are facing northwest towards Mountain Road and away from the site. Each dwelling is surrounded by a mix of deciduous and evergreen vegetation. Views from the rear gardens are to the southwest.

The visual effects immediately adjacent to this receptor group (from the junction between Mountain Road and Kilmoney Woods) are encompassed in a represented photomontage, as included in Appendix 5.1 (View 02).

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The primary views are to the northwest and away from the proposed development. From the rear gardens any views towards the development are expected to be partially screened by the existing vegetation surrounding the properties. The vegetation is evergreen, providing screening all year round. Partial visibility of the proposed development may occur over the existing vegetation. Due to the close distance from the proposed development, it is expected that views will be temporarily impacted during construction phase. Therefore, according to Table 5-1 and Table 5-2 the magnitude of change would be *medium* during construction and *low* during the operational phase.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *temporary, moderate, negative* during construction and *permanent, moderate to slight, negative* during the operational phase with the potential to be reduced as proposed vegetation reaches maturity. The visual character will remain as residential with boundary vegetation.

R3 (0.02km – 0.50km northeast from the site) A suburban group of two-storey dwellings located within Kilmoney Woods estate. The main primary views face west and east. Dwellings on the western side of the estate include some angled views towards the site, whereas the views from the dwelling on the eastern side face away from the proposed development. Mountain Road, located between this receptor group and the proposed development is located at a lower elevation from each surrounding area. Dense evergreen hedging surrounds the existing estate as well as a line of mature broadleaved trees along the Kilmoney Woods road.

The visual effects from this receptor group are represented in a verified photomontage, as included in Appendix 5.1 (View 03).

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The dense evergreen hedging provides full screening of views. Longer range, open views towards the surrounding landscape are expected to occur from upper floor window. Views to the proposed development, when available would be angled. This is expected to be reduced with distance. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *low* at the highest.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, slight, negative*.

R4 (0.3km – 0.7km northeast from the site) A two-storey housing estate at Wrenville and Woodgrove, located north of Mountain Road. Main views of the properties closer to Mountain Road are towards the northeast and southwest and are screened by the surrounding tall mixed hedgerow and tree vegetation. The existing monuments (ringforts and souterrain) within and immediately west of R4 are private and enclosed by the existing dwellings and screening vegetation. Primary views from this receptor are facing away from the proposed development.

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude Existing built environment provides full screening towards the proposed development for the properties to the northern side of the group. Residences to the south are expected to have angled glimpse and filtered views, when available, of the higher elements of the proposed development. Existing topography is expected to provide further screening to the development. Therefore, in accordance with tables 5-1 and 5-2 the magnitude of change would be *negligible*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R5 (Immediately East from the site) A group of two-storey residential estates including Wheatfields and The Monks, located south of the Mountain Road and west of the Kilmoney Road. There is minimal existing tall vegetation within the estate. Main views within this group are towards existing roads and communal spaces and therefore enclosed to the estates themselves. The west boundary of this receptor group is lined with sparse mixed vegetation, comprising a large hedgerow and tree planting. This is comprised of mainly deciduous plants.

The visual effects from this receptor group are represented in a verified photomontage, as included in Appendix 5.1 (View 04).

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude Dwellings with primary views facing west are not expected to have visibility of the proposed development. However, higher parts of the proposed development may be partially visible over the existing boundary properties and filtered by the existing vegetation. The existing vegetation along this boundary within the proposed development site is deemed to be retained. Summer views are expected to be largely screened. Dwelling located further east within this receptor group are not expected to have visibility to the proposed development, with screening provided by the surrounding properties and distance. Therefore, in accordance with Tables 5-1 and 5-2 the highest magnitude of change would be *low*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, slight, negative* during the operational phase.

R6 (0.20km – 0.56km southeast from the site) A group of single to two-storey standalone dwellings. The majority of the dwellings are located near the R611 regional road, while one dwelling is accessed by a private access road off Mountain Road. This receptor group has each dwelling surrounded by dense evergreen and deciduous vegetation including evergreen trees. The topography fluctuates throughout the receptor group, with the lowest point being at the eastern section. The group is surrounded by large irregular pastoral fields, with dense evergreen hedgerows serving as boundaries.

The visual effects from this receptor group are represented in a verified photomontage, as included in Appendix 5.1 (View 06).

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The main views are towards the north and northeast, directed at the proposed development. Any available views are expected to be partially or fully screened through the existing dense property boundary vegetation. Surrounding hedgerows of pastoral fields further strengthens the screening effect. No views are expected from the dwellings to the eastern side of this receptor group due to the sloping topography and intervening vegetation. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change is *low* to *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, slight, negative* to *permanent, imperceptible*.

R7 (0.14km – 0.45km southwest from the site) A linear group of single to two-storey dwellings located adjacent to Mountain Road to the south. This receptor group is densely screened by mixed evergreen and deciduous vegetation throughout property boundaries and along the existing road. Primary views vary between north, south and west, away from the proposed development.

The visual effects from this receptor group are represented in a verified photomontage, as included in Appendix 5.1 (View 08).

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The receptor group is surrounded by dense evergreen vegetation, with primary views facing away from the site. Any available views are expected to be angled and filtered by the immediately surrounding vegetation. In accordance with Tables 5-1 and 5-2 the magnitude of change would be *negligible*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R8(0.66km – 0.75km west from the site) Two dwellings within a sideroad leading to Forest Road. The dwellings are surrounded by irregularly shaped pastoral fields. The property to the east is surrounded by vegetation and farmyard sheds. Each surrounding field is divided by dense evergreen and deciduous hedgerows. At 237m to the east of the receptor group is a densely vegetated riparian strip of mainly deciduous tall trees

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The receptor group is surrounded by dense evergreen and deciduous hedgerows in all directions. Screening is provided within close proximity as well as along the surrounding field boundaries. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change is *negligible*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible, negative*.

R9 (0.8km – 1.9km northwest from the site) A group of single- to two-storey dwellings along the Forest Road. All dwellings are surrounded by existing evergreen and deciduous vegetation. The landscape is rural, with large pastoral fields divided by dense deciduous and evergreen hedgerows. Main views are to the north and the south facing Forest Road and away from the proposed development.

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude Views are generally limited to Forest Road due to screening provided by surrounding vegetation. Views to the proposed development are expected to be fully screened by the intervening vegetation, topography and distance. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change is *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R10 (0.6km - 1.0km north from the site) A group of single to two-storey dwellings located along the Captains Boreen Road to the northern section and Bóthar glas to the west. Each dwelling is surrounded by dense evergreen and deciduous vegetation. The receptor group is within a rural landscape, with large fields divided by dense hedgerows. It includes two designated monuments (a country house and an enclosure) and is surrounded by other monuments such as religious house to the east, a ringfort to the south and a ringfort to the west and north. These monuments are within private ownership and screened by topography and vegetation. A dense riparian corridor is located approximately 431 metres away to the south. This receptor group is located at a lower elevation to the surrounding landscape to the south.

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The main views are limited to the road itself, screened from the surrounding lands and properties by existing dense vegetation. Views from this receptor are short distanced with longer ranging views, when available, only occurring as glimpses to the riparian corridor to the south. The proposed development is not expected to be visible from this location. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R11 (1.47km – 2.1km north from the site) A group of single to two-storey buildings mainly located along the Ballea Road. The western section of the group is along the L6487. The surrounding landscape is generally rural, just at the fringe of the urban core of Carrigaline. The surrounding fields are divided by evergreen hedgerows and small patches of forestry. Each dwelling is also surrounded by evergreen and deciduous vegetation. This is not the case for the eastern section of the group that is

situated higher on a hill allowing for wider views. Certain areas of the road are surrounded by vegetation. Existing bridges, designated as NIAH, are located low in elevation and surrounded by mature vegetation. Other designated monuments within this receptor group are within private land, fully screened by vegetation and topography.

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The western section of this receptor group is effectively fully screened from the development site due to the undulating topography fully screening view towards the proposed development. The vegetation surrounding each dwelling would further limit angled views towards the roadway. Existing built environment at the fringe of Carrigaline towards the direction of the proposed site adds to the screening of views. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R12 (1.2km – 1.9km north from the site) A large urban housing estate comprising two-storey dwellings along Ballea Road. The topography of the receptor group is lower than its surrounding areas allowing for no long-range views and only limited mid-range ones. The urban cluster of Carrigaline lies between this receptor group and the proposed development. A ringfort and souterrain are located at the centre of this receptor group, within a pocket open space at The Grove. These monuments are fully enclosed by the existing residential dwellings.

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The receptor group is within a low terrain, with no allowed views towards the development as they are fully screened by Carrigaline set upon higher terrain. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *imperceptible*.

R13 (0.23km – 0.9km northeast from the site) A large residential urban estate comprised of two storeyed dwellings located next to the Kilmoney Road to the west and north. The surrounding landscape is urban, with residential estates surrounding the receptor group, followed by a few patches of pastoral fields to the north and south of the group. There is a monument (ringfort) within this receptor group, which is within a pocket open space in Woodview. This ringfort is enclosed in all directions by the existing dwellings. Kilmoney Bridge (NIAH no. 20909818) is located north of this receptor group and is screened by the dense riparian vegetation.

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The receptor group incorporates the majority of the western built area of Carrigaline south of the Owenabue. It is set within an urban landscape, surrounded by residential estates to the west and to the east. Most views towards the proposed development are expected to be fully screened by the existing built environment. Small sections of the group may have partial, angled and filtered views of the proposed development. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *negligible*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R14 (0.9km – 1.8km northeast from the site) The receptor group incorporates the majority of the eastern built area of Carrigaline south of the Owenabue. It is set within an urban landscape, surrounded by residential and commercial estates

to the west and to the east. There are two NIAH and two designated monuments within this receptor group, within the urban fabric of this area. This receptor group lies lower than the surrounding residential estates.

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude The receptor group is within an urban landscape, surrounded by residential estates to the west of the group, and a town centre to the north. Views towards the proposed development are expected to be fully screened by the existing built environment. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *imperceptible*.

R15 (0.8km – 1.1km east from the site) A group of one to two-storey dwellings located along Rose Hill Road and L6498 local road. The surrounding landscape is rural. With large pastoral fields and forestry strips bordered by evergreen and deciduous hedgerows. An equestrian centre is located to the east of this receptor group. This receptor is located on a hill with L6498 sited at a higher elevation and Rose Hill Road at a lower one.

The visual effects from this receptor group are encompassed in a verified photomontage, as included in Appendix 5.1 (View 05).

Sensitivity Receptors are residents at home. Sensitivity is *high*.

Magnitude This receptor group is within a rural landscape, with short-range views from Rose Hill Road due to the screening topography and vegetation. Long ranging views are available from L6498 but are filtered by the intervening vegetation and other built elements. The existing residential estates to the northwest at Castle Hights and Wheatfields would effectively provide screening to the available views towards the proposed development site. Possible views would comprise new ridgelines appearing amongst existing roofs. The visual character would not change from a long ranging view with agricultural and residential character. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *low to negligible*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, slight, negative to permanent, imperceptible*.

R16 (0.84km – 1.4km southeast from the site) A group of single-storey to two-storey dwellings located next to the L6498. The landscape surrounding this group is predominantly rural with large pastoral fields and dense hedgerows with trees along their boundaries. Longer ranging views, albeit angled, are available due to these receptors being at the highest elevation of the hill in this location.

Sensitivity The receptors are residents at home. Sensitivity is *high*.

Magnitude The location of this receptor group that lies on higher terrain is expected to allow for views over the proposed development. Views are expected to be long-range, angled, partial and filtered by the existing hedgerows lining the L6498. The proposed development, where visible, is not expected to break ridge. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *negligible*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R17 (1.2km – 1.8km southeast from the site) A group of single to two-storey dwellings located at Ballinvarosig townland. The landscape surrounding this group is predominantly rural with large pastoral fields and dense hedgerows with trees along their boundaries. Primary views are facing southwest the road and generally away from the proposed development site. A small,

forested strip is located to the north of this group. This receptor group is located at a lower elevation and surrounded by two hills to the east and west. A designated monument (ringfort) that is within private lands is sited at the base of the hill and northern section of R17.

Sensitivity The receptors are residents at home. Sensitivity is *high*.

Magnitude The receptor group is enclosed by the receiving topography and vegetation, providing screening in all directions. The proposed development is expected to be fully screened. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R18 (1.3km – 2.3km south from the site) A large group of single to two-storey dwellings mainly located along the L6498, with fewer dwellings located along the R611 and the L2494. The surrounding landscape is dominated by fields with dense hedgerows and deciduous trees. The group lies on elevated terrain, overlooking the surrounding landscape to the south. Each dwelling and designated monuments within private ownership are surrounded by evergreen and deciduous vegetation restricting open views to partial and filtered.

Sensitivity The receptors are residents at home. Sensitivity is *high*.

Magnitude Views towards the proposed development are not expected due to this receptor group being located on a hill sloping south, with the available views being towards the south and away from the proposed development. The proposed development is expected to be fully screened by the intervening topography, vegetation and distance. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R19 (0.63km – 1.1km south from the site) A linear group of single to two-storey dwellings located along a sideroad leading into the L2494. Each dwelling is surrounded by evergreen vegetation. The sideroad is also lined with a low hedge. The surrounding landscape is dominated by fields with dense hedgerows and deciduous trees. One of the eastern fields includes a standing stone (designated monument). An existing forested strip is located 460m to the north between this receptor group and the proposed development site. The topography in this location is gently undulating. Primary views are towards the north and south, towards the existing road.

The visual effects from this receptor group are represented in a verified photomontage, as included in Appendix 5.1 (View 07).

Sensitivity The receptors are residents at home. Sensitivity is *high*.

Magnitude Views towards the site are limited by the dense hedgerows and trees that form the boundaries of the pastoral fields. Further screening is provided by the existing forested strip and the intervening topography. The proposed development is not expected to be visible from this receptor group. Therefore, in accordance with methodology the magnitude of change would be *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

R20 (1km – 1.9km southwest from the site) A group of single to two-storey dwellings. The surrounding landscape is rural. Pastoral and agricultural fields make up most of the landscape. The side road leading from the location of this receptor group to the Mountain Road is lined with tall deciduous and evergreen hedging with occasional gaps allowing for narrow

mid-range views to the northeast. The group is sited at an elevated area that allows for longer views where not obstructed by vegetation. There are two designated monuments within private lands, one within a woodland area, the other screened by tall hedgerow along the road alignment.

Sensitivity The receptors are residents at home. Sensitivity is *high*.

Magnitude Intermittent views towards the site are expected to be allowed, yet partially screened by existing vegetation. Views to the proposed development from the dwellings within lower elevations are expected to be fully screened by the intervening topography. Therefore, according to Tables 5-1 and 5-2 the magnitude of change would be *negligible*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*. Visual effects would be *neutral* where the intervening topography fully screens the proposed development.

5.7.2.2 Community receptors

C1 (0.41 to 0.88km southeast from the site) An equestrian centre. The landscape directly surrounding this receptor is comprised of pastoral fields and greenfields with dense boundary hedgerows. Housing estates are also found in the vicinity to the north. The equestrian centre is surrounded by tall evergreen and deciduous trees restricting views in all directions. The receiving landscape is sloped towards the north and there is a stream and associated riparian vegetation located to the west of this receptor.

Sensitivity The receptors are visitors engaged in activities and workers within the site. Sensitivity is *low*.

Magnitude Views towards the site are expected to be fully screened by the existing mixed vegetation and nearby residential estates. If the proposed development is visible from this receptor, it will be glimpses from gaps in the existing dense screening vegetation. The intervening meandering topography is expected to also provide screening. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *low*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

TC (1.3 to 1.9km northeast from the site) The town centre of Carrigaline comprising of various commercial spaces and community areas. There is one designated monument (Mill) at the centre of this receptor. Surrounding the group is mainly an urban landscape comprising of residential estates and occasionally areas of pastoral fields. This receptor lies lower in the valley with the surrounding topography providing screening in all directions. Main views are limited to the streetscape and narrow Owenabue valley.

Sensitivity The receptors are visitors and commercial workers within the Town centre. Sensitivity is *medium*.

Magnitude Views towards the site are not expected due to the existing built environment, as well as the topography. Therefore, in accordance with Tables 5-1 and 5-2 the magnitude of change would be *neutral*.

Effect In accordance with Tables 5-1 and 5-2 the visual effect would be *permanent, imperceptible*.

5.8 The ‘Do Nothing’ Scenario

In the event the proposed development is not constructed, no change is expected to the landscape and visual amenity of the site. Any expected changes to the existing vegetation due to maturity are not expected to have any negative nor positive impact in the short- or long-term.

The Do-Nothing option may result in pressure on the Cork County Area for development of other sites for housing and stem progress of objectives outlined in the Cork CDP. As the land has been zoned for new residential development the Do-Nothing option is not considered further in this report.

5.9 Potential Significant Effects

5.9.1 Demolition Phase

5.9.1.1 Landscape

The proposed development will change the fabric within the boundaries of the proposed development. It is not going to change the landscape character through the removal of existing facilities and dwellings within the threshold of the site. The removal of certain sections of hedgerows for access is limited and focused mainly on the northern boundary. The overall field pattern is retained. **No significant negative impacts are expected.**

5.9.1.2 Visual Impact

Surrounding receptors of the site are residents of dwellings and are *highly* sensitive. The magnitude of these visual changes will include slight changes in treeline and hedgerows, with the majority of existing hedging and treelines to be preserved. Therefore, the magnitude of change will range from *low to medium*. The highest negative visual impacts are expected to be *moderate*, and would be restricted to the residential receptors to the north, located in closer proximity to the proposed development boundary works. **These impacts are not significant.**

5.9.2 Construction Phase

5.9.2.1 Landscape

The construction phase will include the temporary addition of welfare units within the site, as well as the addition of materials that will be stockpiled within the site. Machinery will be included. Waste disposal areas will be designated within the site. Changes upon the landscape will include debris, soil removal and loss of some vegetation. The addition of temporary security fencing would also have a negative impact on the landscape. **This is expected to be temporary and not significant.**

5.9.2.2 Visual Impact

Surrounding receptors are residents which are of *high* sensitivity. The elements of visual changes upon the views will include the removal of soil and some vegetation, as well as the introduction of welfare units, material stockpiles, equipment and machinery. These visual changes are expected to have a slight to imperceptible visual impact as the surrounding hedgerows will be largely preserved. The visual effects to the northern boundary will be *moderate* due to the wider extent of vegetation removal in this location. **These impacts are not significant.**

5.9.3 Operational Phase

5.9.3.1 Landscape

The proposed development will change the fabric of the landscape within its boundaries by converting greenfield/ agricultural fields into a residential area, slightly altering the rural and semi-rural character. The introduction of 362 no. residential units will increase the built density and increase the urban elements along Mountain Road. This is at a density that appears proportional to the existing, for a site that is zoned for residential. Therefore, the impact to the landscape is expected to be *slight*. **This impact is not significant.**

5.9.3.2 Visual Impact

During the operational phase, the surrounding receptors are expected to have their visual amenity affected. The existing largely retained vegetation and undulating topography provides sufficient screening. Vegetation removed during construction will be replaced with new planting and establish during operational phase. The highest negative impact of the operational phase is expected to be *temporary, moderate to permanent, slight*. **These impacts are not significant.**

5.9.4 Cumulative Effects

Cumulative impact is the incremental impact created by the proposed development in the context of surrounding land uses, recent changes and considered future development. This chapter will focus on the cumulative visual effects of similarly proposed developments as well as the impact upon the landscape on the potential changes to the rural and suburban settings. In this chapter, only the foreseeable future works are assessed.

Application 246418: To the east of the proposed development and south of Wheatfields estate, a smaller development comprising 39 no. residential units (2no. bungalow units and 37no. terraced units) and 2no. residential serviced sites in Kilmoney, Carrigaline. Located immediately adjacent to the proposed development site, it is expected that the cumulative visual and landscape effects will be similar to that of the proposed development. This development is effectively screened by the existing vegetation and built environment and is not expected to alter the residential and semi-rural character of the view from surrounding receptors. Receptors at Wheatfield are expected to have visibility to the ridgeline of this development to the south, in conjunction with the proposed development to the west; however, due to the scale of this development, the contribution to a continuous view will be negligible from surrounding receptors.

Overall, **no significant negative cumulative effects** are expected to occur from the proposed works in conjunction with other proposed developments.

5.9.5 Summary

There are **no significant negative effects**, temporary nor permanent expected to arise from the proposed development. The highest impacts as assessed are *temporary, moderate, negative* and are expected to impact the views of the residencies directly to the north of the proposed development where existing vegetation is to be removed. These impacts are expected to be reduced as the existing and proposed vegetation reach maturity, filtering the previously opened views.

5.10 Mitigation Measures

No significant landscape or visual impacts are expected during all phases of the proposed development. The retained vegetation along with the proposed landscape and planting plans will mitigate against negative landscape and visual impacts. **Therefore, no mitigation is required.**

5.11 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented. There are no significant impacts requiring mitigation therefore no residual impacts that are expected.

5.12 Risk of Major Accidents or Disasters

No risks of major accidents or disasters have been identified during this assessment.

5.13 Interactions

Elements of the Cultural Heritage chapter may interact with the Landscape and Visual amenity offered in this location. These are the designated monuments surrounding the proposed development site. The interaction is expected to be *negligible* and therefore **not significant**.

5.14 Monitoring

Monitoring elements have not been included due to mitigation measures not being required.

5.15 Summary of Mitigation and Monitoring

No mitigation, and therefore no monitoring, is required.

5.16 Conclusion

The proposed development site is situated within the townland of Kilmoney, Carrigaline, Co. Cork. To the south and west the majority of land use is a mix of greenfield and agricultural lands, with a ribbon of residential estates and individual one-off dwellings along Mountain Road. Carrigaline urban fabric is located to the east, with estates such as Wheatfields and Abbey Lane immediately adjacent to the existing site.

The receiving landscape is relatively flat and currently comprises agricultural fields with grasslands, enclosed and separated by mature tall hedgerows and trees. These dense hedgerows sit on top of drainage ditches separating fields. The centre of the site includes a patch of dense deciduous woodland.

According to the Cork County Development Plan 2022-2028 (CDP) and Draft Landscape Strategy 2007 (LCA), the proposed development site is located within the landscape character type 6a – Broad Fertile Lowland Valleys (Blarney-Ballincollig-Carrigaline-West to Dunmanway). The landscape is described as comprising shallow and flat valleys contributed by the Owenabue river valley. Both the landscape value and sensitivity are ‘High’, and importance rated as being of ‘County’ level.

There are no protected views and prospects, or scenic routes inside or within 1km of the proposed development site. There are also no designated architectural conservation area or protected structures within the proposed development site. There are thirteen (13no.) national monuments located within 1km of the proposed development site; however, they are sited within private and generally enclosed lands.

The proposed development will change the fabric of the landscape within its boundaries by converting greenfield/ agricultural fields into a residential area, slightly altering the rural and semi-rural character. The introduction of 362 no. residential units will increase the built density and increase the urban elements along Mountain Road. This is at a density that appears proportional to the existing, for a site that is zoned for residential. According to the methodology and taking account to the proposed design, the overall impact to the landscape is expected to be *temporary, slight to moderate, negative* during construction phase and *permanent, slight, negative* during operational phase.

The surrounding receptors of the site are residents of dwellings and are highly sensitive. The magnitude of these visual changes will include slight changes in treeline and hedgerows, with the majority of existing hedging and treelines to be preserved. Therefore, the magnitude of change will range from *low to medium*. The highest negative visual impacts are expected to be *moderate* during demolition and construction phases and would be restricted to the residential receptors to the north, located in closer proximity to the proposed development boundary. Vegetation removed during construction will be replaced with new planting and establish during operational phase. The other existing largely retained vegetation and undulating topography provides sufficient screening throughout. The highest negative impact of the operational phase is expected to be *temporary, moderate to permanent, slight*. However, visual effects to visual receptors distanced further than 250m from the proposed development are expected to be *permanent, imperceptible*.

The cumulative effects arising from the proposed development in the context of the surrounding land are expected to be *negligible* due to the scale and siting of application 246418 to the east, in relation to the proposed developments.

Overall, no significant negative landscape and visual effects, as well as cumulative effects, are expected to occur.

5.17 References and Sources

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

Guidelines for Landscape and Visual Impact Assessment (GLVIA) as published by the Landscape Institute (UK) and the Institute of Environmental Management and Assessment (3rd Edition, 2013);

Notes and Clarifications on Aspects of Guidelines for Landscape and Visual Impact Assessment, third edition (GLVIA3), as published by the Landscape Institute (UK) (2024);

National Landscape Strategy 2015-2025; Department of the Environment, Community and Local Government;

Guidelines on Landscape and Visual Assessment (2002); Irish Landscape Institute (ILI);

Cork County Draft Landscape Strategy (2007);

Cork County Development Plan 2022-2028;

CHAPTER SIX

MATERIAL ASSETS: TRAFFIC & TRANSPORT



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER SIX

Table of Contents

Material Assets: Traffic & Transport

- 6.1 Introduction 6-1
- 6.2 Expertise and Qualifications 6-1
- 6.3 Proposed Development 6-1
- 6.4 Methodology 6-1
- 6.5 Potential Environmental Effects 6-2
- 6.6 Difficulties Encountered..... 6-3
- 6.7 Baseline Environment..... 6-3
- 6.8 The ‘Do Nothing’ Scenario 6-7
- 6.9 Characteristics of the Proposed Development 6-8
- 6.10 Potential Significant Effects 6-8
- 6.11 Trip Generation 6-11
- 6.12 Traffic Distribution..... 6-11
- 6.13 Accidents and Safety 6-14
- 6.14 Residual Impact Assessment 6-14
- 6.15 Mitigation Measures 6-14
- 6.16 Summary of Post-mitigation Effects 6-15
- 6.17 Risk of Major Accidents or Disasters 6-17
- 6.18 Worst Case Scenario..... 6-17

6.19 Interactions.....6-17

6.20 Monitoring.....6-17

6.21 Summary of Mitigation and Monitoring 6-17

6.22 Conclusion 6-18

6.23 References and Sources 6-18

Table of Tables

Table 6.1 Framework for Determining Sensitivity of Receptors	6-2
Table 6.2 Framework for Determining Magnitude of Effects.....	6-2
Table 6.3 Significance Criteria Matrix.....	6-2
Table 6.4 2024 Base AADT.....	6-7
Table 6.5 Construction Impact	6-9
Table 6.6 Severance (without mitigation)	6-10
Table 6.7 Severance (with mitigation).....	6-10
Table 6.8 Predicated Development Trips (Veh).....	6-11
Table 6.9: AADT Link Flows & Development Contribution (post construction/operational)	6-12
Table 6.10 Severance	6-12
Table 6.11 Driver Delay	6-13
Table 6.12 Pedestrian Delay and Amenity	6-13
Table 6.13 Summary of Construction Phase Likely Significant Effects in the absence of mitigation.....	6-13
Table 6.14 Summary of Operational Phase Likely Significant Effects in the absence of mitigation.....	6-13
Table 6.15 Accidents and Safety	6-14
Table 6.16 Summary of Construction Phase Effects Post Mitigation	6-16
Table 6.17 Summary of Operational Phase Effects Post Mitigation	6-16
Table 6.18 Summary of Construction Phase Mitigation and Monitoring	6-17
Table 6.19 Summary of Operational Phase Mitigation and Monitoring	6-18

Table of Figures

Figure 6.1 Cycle linkages	6-4
Figure 6.2 New bus services- Carrigaline (Bus Connects - NTA).....	6-5
Figure 6.3 JTC and ATC Locations Source: Google Maps	6-6
Figure 6.4 Links in the Study Area (PM peak flows)	6-7
Figure 6.5 Construction Haulage Routes	6-10
Figure 6.6 Proposed Active Travel Connections in Carrigaline	6-15
Figure 6.7 Potential construction build out phasing	6-16

CHAPTER SIX | Material Assets: Traffic & Transport

6.1 Introduction

MHL & Associates Ltd., Civil Engineering Consultants, undertook the preparation of this section of the Environmental Impact Assessment Report (EIAR), in association and consultation with Arbocare, Deady Gahan Architects, Enviroguide, OSL, Precise Control and SRLA.

This chapter of the Environmental Impact Assessment Report (EIAR) has been prepared to assess the potential impact of the proposed development on traffic and transport. It provides an overview of the existing environment, including the current road network, traffic conditions, and surrounding transport infrastructure. A comprehensive and robust assessment of the potential effects on the local road network has been undertaken, covering both the short-term construction phase and the long-term operational phase of the development. Additionally, the chapter outlines mitigation measures aimed at minimising or avoiding significant impacts on traffic flow and road safety.

The Traffic and Transport Assessment has been prepared by MHL Consulting Engineers Ltd., who have extensive experience in Transport Statements, Transport Assessments, and development proposals across Ireland. This document should be read in conjunction with the accompanying Transport Assessment, which includes a Mobility Management Plan as part of the planning application.

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on the local traffic and transportation network, as well as the surrounding environment. It evaluates how the project may influence traffic patterns, pedestrian safety, and air quality, while also considering the effects on nearby communities and infrastructure. The assessment aims to identify any potential adverse impacts arising from increased traffic volume and movement during both the construction and operational phases, ensuring that effective mitigation strategies are proposed to promote a safe, efficient, and sustainable transportation environment.

It should be read in conjunction with reference other relevant Chapters of this EIAR, inclusive of supporting assessments/reports/plans submitted as part of this application.

6.2 Expertise and Qualifications

The Traffic and Transport Assessment has been prepared by qualified transport engineers and planners with expertise in traffic modelling, transport impact assessment, and infrastructure planning. The team is experienced in preparing EIAR chapters in line with the Design Manual for Urban Roads and Streets (DMURS, 2019) and other relevant guidelines such as TII's Traffic and Transport Assessment Guidelines (2014), ensuring the highest standards are adhered to.

This chapter of the EIAR was prepared by Mr. David Murphy, B.Eng. (Hons), M.A, MIEI, of MHL & Associates, and reviewed by Mr. Brian Murphy, BE, CEng MIEI and Mr. Bryan Hill, ME, MIEI of MHL & Associates.

David holds an honours bachelor's degree Civil, Structural and Environmental Engineering, with a Masters in Coastal Management and Geographical Information Systems. David has carried out numerous Traffic and Transportation Assessments, Traffic Statements, Mobility Planning and has been involved in the preparation of EIARs for the following projects:

- Ringwood LRD Phase 01
- Ringwood LRD Phase 02

6.3 Proposed Development

The full description of the proposed development is outlined in Chapter 2 'Project Description' of this EIAR. In summary, the applicant seeks permission for the following Large Scale Residential Development (LRD) comprising the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

6.3.1 Aspects Relevant to this Assessment

The proposed development is a large mixed-use scheme that will generate additional traffic during all phases. Key aspects considered in this assessment include:

- Access and egress points from the development site to the local road network.
- Potential changes to traffic flow, parking requirements, and public transport demand.
- Impact on active travel modes (walking and cycling).
- Interactions with existing and future road infrastructure, as outlined in Project Ireland 2040 and other regional strategies.
- Internal road layout & parking and external road improvements

6.4 Methodology

The methodology follows a structured approach based on relevant guidance and best practice for transport impact assessment.

In Ireland, there are currently no definitive guidelines or standards for quantifying or describing the effects of traffic and transport in the context of Environmental Impact Assessments (EIA). However, Transport Infrastructure Ireland (TII) provides Traffic and Transport Guidelines that indicate if the traffic impact from a new development is expected to exceed 10% of existing traffic movements, it is considered material regarding the local network. In sensitive areas, this threshold is reduced to 5%.

In the UK, the Institute of Environmental Management and Assessment (IEMA) offers additional guidance in its publication, Environmental Assessment of Traffic and Movement (2023). The IEMA recommends two broad rules to help determine the scale and extent of assessments: if traffic (or heavy goods vehicles) increases post construction by more than 30%, a more detailed assessment is warranted, while a 10% increase threshold is advised for sensitive locations. According to the IEMA Guidelines, various indicators are utilized to assess the significance of relief from severance. Changes in traffic flow of 30%, 60%, and 90% are categorized as producing 'slight', 'moderate', and 'substantial' changes, respectively. The guidelines also indicate that increases in traffic flow of less than 10% on uncongested roads are generally considered 'not significant' since daily variations in background traffic can fluctuate within this range.

The following section outlines the methodology used to assess the significance of effects at locations along the proposed routes within the study area, focusing on those where total traffic levels exceed the screening thresholds established by IEMA. If operational traffic impacts exceed 30% on any particular link or 10% on sensitive links, a detailed assessment of the significance of the effect is conducted. This assessment considers link sensitivity and the magnitude of change, taking into account criteria set out in the IEMA Guidelines, including severance, driver delay, pedestrian delay, pedestrian amenity, and safety.

6.4.1 Sensitivity

The sensitivity of a road segment to changes in traffic levels, as well as the receptors located along that segment, is typically evaluated by examining the residual capacity of the network under current conditions. When there is a substantial amount

of residual capacity, the network can easily accommodate an increase in traffic, indicating low sensitivity to change. In contrast, if existing traffic levels are close to the road's capacity, leaving minimal spare capacity, the sensitivity to fluctuations in traffic levels is considered high.

The criteria used to assess the sensitivity of the receptors, and the magnitude of change are summarized in the following Table 6.1.

Table 6.1 Framework for Determining Sensitivity of Receptors

Sensitivity	Description
High	The receptor/resource has limited capacity to accommodate change without fundamentally altering its current character and is of national or international significance. This includes local residents reliant on unrestricted movement in their environment, as well as receptors such as schools, colleges, hospitals, and accident-prone areas.
Medium	The receptor/resource can moderately accommodate change without significantly affecting its existing character and holds considerable importance.
Low	The receptor/resource can tolerate change without impacting its character and is of low or local significance. This includes areas like trunk roads or 'A' class roads designed to handle substantial heavy goods vehicle (HGV) volumes.
Negligible	Users are not sensitive to transportation impacts. This category encompasses very small settlements and roads without significant populations, including new strategic trunk roads or motorways.

6.4.2 Magnitude

The magnitude of effects is a function of the existing traffic volume, the percentage increase and change due to the proposed development, changes in the type of traffic and the temporal distribution of traffic (day of week, time of day).

The determination of magnitude has been undertaken by reviewing the proposed development, establishing the parameters of the receptors that may be affected and quantifying these effects utilising guidelines and professional judgement. Consideration is given to the composition of the traffic on the road network, under both existing and proposed conditions. For example, LGVs have less effect on traffic and the road system than HGVs. Similarly, HGVs can have less effect than abnormal load vehicles, depending on the frequency of the abnormal loads. The criteria that have been used to make judgement on the magnitude of the effect on the receptor(s) is presented in Table 6.2.

Table 6.2 Framework for Determining Magnitude of Effects

Major
Complete loss of, or significant alteration to, essential elements/features of the baseline (pre-development) conditions, resulting in a fundamental change to the post-development character, composition, or attributes. Typically, a change in traffic exceeding 90% (or over 70% at sensitive receptors) is classified as a major magnitude.
Moderate
Loss or alteration of one or more key elements/features of the baseline conditions, leading to a substantial change in the post-development character, composition, or attributes. Generally, a change in traffic between 60% and 90% (or between 40% and 70% at sensitive receptors) is regarded as moderate magnitude.

Minor

A slight deviation from baseline conditions. The change due to loss or alteration will be noticeable but not significant. The fundamental character, composition, or attributes of the baseline conditions will remain similar to those prior to development. Typically, a change in traffic ranging from 30% to 60% (or from 10% to 40% at sensitive receptors) is seen as a minor magnitude.

Negligible

Minimal change from baseline conditions. The change is hardly noticeable, resembling a situation of 'no change.' Typically, a change in traffic of less than 30% (or under 10% at sensitive receptors) is considered negligible magnitude.

Significance

To guide the assessment—though not as a replacement for professional judgment—the criteria for evaluating the significance of traffic-related effects are detailed in Table 6.3. This assessment is based on the combination of the effect's magnitude and the sensitivity of the receptor.

Table 6.3 Significance Criteria Matrix

Sensitivity of Receptor	Magnitude of Change			
	Major	Moderate	Minor	Negligible
High	Major	Major / Moderate	Moderate	Minor
Medium	Major / Moderate	Moderate	Moderate / Minor	Minor
Low	Moderate	Moderate / Minor	Minor	Negligible

Significance is classified as major, moderate, minor, or negligible. Effects assessed as minor or negligible significance are regarded as 'Not Significant.'

6.5 Potential Environmental Effects

The assessment focuses on evaluating the potential environmental impacts associated with traffic and transport. The EPA EIAR guidelines (2022) provide several definitions to describe potential significant effects, including aspects related to the quality, significance, extent, probability, duration, frequency, and type of effects. While some of these can be clearly defined using the EPA guidelines, interpreting the significance of the effects depends on professional engineering judgment. The IEMA Guidelines identify several potential significant effects, including:

- Noise
- Driver delay
- Pedestrian delay
- Pedestrian amenity
- Accidents and safety
- Hazardous loads (e.g., nuclear products)
- Dust and dirt

According to the IEMA guidance, to determine the scale and extent of the assessment and the impact of the Proposed Development on the surrounding road network, the following two ‘rules’ should be adhered to:

Rule 1 – Include highway links where traffic flows are expected to increase by more than 30% (or 10% if it impacts a sensitive area) or where the number of heavy goods vehicles (HGVs) is anticipated to rise by more than 30%.

Rule 2 – Include any specifically sensitive area where traffic flows are projected to increase by 10% or more.

Paragraph 2.5 of the IEMA Guidelines outlines groups, locations, and special interests that may be sensitive to changes in traffic conditions, which include:

- Residents
- Employees in workplaces
- Vulnerable groups such as children, the elderly, and individuals with disabilities
- Sensitive locations, such as hospitals, churches, schools, and historic buildings
- Individuals walking or cycling
- Open spaces, recreational areas, and shopping districts
- Sites of ecological or nature conservation significance, as well as tourist attractions

The significance of each effect is considered against the criteria within the IEMA Guidelines, where possible, however the guidelines state that:

“For many effects there are no simple rules or formulae which define the thresholds of significance and there is, therefore, a need for interpretation and judgement on the part of the assessor, backed- up by data or quantified information wherever possible. Such judgements will include the assessment of the numbers of people experiencing a change in environmental impact as well as the assessment of the damage to various natural resources.”

6.5.1 Relevant Legislation & Guidance

The Traffic and Transport chapter of this Environmental Impact Assessment Report (EIAR) has been prepared in alignment with the assumptions outlined in the accompanying Traffic and Transport Assessment and relevant EIAR guidance documents. The chapter is informed by the following key guidelines:

- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (European Commission, 2017)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning & Local Government, 2018)
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022)
- Institute of Environmental Management and Assessment (IEMA) Guideline: Environmental Assessment of Traffic and Movement (IEMA, 2023)
- PAG Unit 5.3: Travel Demand Projections (TII, 2019)
- Project Ireland 2040 – National Planning Framework
- Transport Infrastructure Ireland’s (TII’s) Traffic & Transport Assessment Guidelines (2014)
- Cork County Development Plan 2022-2028
- Design Manual for Urban Roads and Streets (DMURS) (updated 2019)
- National Cycle Manual (NTA, 2023)

These guidelines ensure that the assessment is consistent with national and European best practices and considers both current and future transport infrastructure needs.

6.5.2 Site Surveys/Investigations

Site visits and surveys were conducted to gather current traffic data, road conditions, and public transport usage. Data were collected over a typical week, covering peak and off-peak periods to ensure a representative sample of traffic patterns and transport activity. Traffic count surveys were conducted by Irish Traffic Surveys Ltd at identified junction on the adjacent road network.

6.5.3 Consultation

Section 247 Pre-Application meetings have been held with Cork County Council (CCC) on 10th May 2024 and a second meeting 31st of July 2024. In addition, a Section 32C pre-planning meeting was held with representatives of Cork County Council on 14th November 2024. Several follow up meetings have been held with members of CCC’s Traffic and Transportation service, to discuss the methodology of both the EIAR and TA. Topographical survey were undertaken by Precise Control.

The design team has engaged with key stakeholders, including Cork County Council and Transport Infrastructure Ireland (TII), to address traffic and mobility concerns and ensure compliance with guidelines. On TII’s feedback, a Traffic and Transport Assessment (TTA) was conducted in accordance with TII’s 2014 guidelines, considering traffic volumes, key routes, and impacts on the adjoining road network. Sub-threshold requirements in Section 2.2 of the guidelines were also addressed. Additionally, a Road Safety Audit (RSA) evaluated potential safety impacts, particularly at nearby junctions. All assessments align with national best practices, emphasizing mitigation of significant road network impacts and ensuring safety and efficiency.

6.6 Difficulties Encountered

No major difficulties were encountered during the assessment, although some minor limitations, such as seasonal variations in traffic data and public transport schedules, were noted. These were addressed by using industry-standard traffic modelling techniques to normalize the data. The available traffic data was comprehensive and current, allowing for an accurate analysis of local conditions. Additionally, on site validation during the teams site visits provided valuable insights into specific traffic patterns. This approach ensured a robust assessment of current and projected future traffic impacts and a thorough evaluation of sensitive receptor responses to changes in traffic levels. Overall, the process benefited from a strong foundation of data and supportive resources.

6.7 Baseline Environment

6.7.1 Receiving Environment

The following section provides a summary of the proposed development’s receiving environment. Full details are included the submitted Traffic and Transport Assessment.

The receiving environment describes the current traffic conditions, road infrastructure, and the overall transportation network surrounding the proposed development site. This includes an assessment of existing traffic volumes, vehicle types, and peak travel times, as well as the conditions of local roads and their capacities. Additionally, it considers sensitive receptors in the vicinity, such as residential areas, schools, hospitals, and community facilities, which may be affected by increased traffic. The evaluation included pedestrian and cyclist infrastructure, public transport availability, and traffic safety issues, providing a comprehensive

understanding of how the existing environment interacts with current traffic patterns. By establishing a clear baseline of the receiving environment, the assessment can effectively identify potential impacts of the proposed development and inform appropriate mitigation measures to minimize disruption to the surrounding community and infrastructure.

6.7.2 Site Location

The subject site is located circa 2.25km to the southwest of the town centre in Carrigaline, and c. 1km to the west of the R611. It is to be accessed via a new priority junction with Mountain Road (L6495), which will be the single point of access for vehicles, cyclists and pedestrians.

6.7.3 Transport Accessibility & Infrastructure

The closest bus stops to the site are located on the Kilmoney Road Upper, close to the junction with Mountain Road/ R611. These are circa 700m in distance from the proposed site access point, which corresponds to an approximate 10 -minute walking time.

Bus Éireann Service 220 runs along the Kilmoney Road Upper, usually on a 15-minute frequency throughout the day on Monday through to Sunday. Currently this service is running on a 20-minute frequency due to staff shortage within Bus Éireann.

Please refer to <https://www.buseireann.ie/news/revised-temporary-timetable> for up-to-date service information. The 225 bus is also available in Carrigaline, albeit around 25 min walk from nearest bus stop. Service 220 runs between Ovens, Ballincollig, Cork City Centre, Douglas, and Carrigaline.

6.7.4 Road Network Infrastructure & Traffic Conditions

The local road network comprises a mix of primary, secondary, and tertiary roads, with varying levels of congestion depending on the time of day. Traffic counts and surveys indicate moderate to high volumes during peak periods.

6.7.5 Public Transport & Site Accessibility

The site is served by multiple bus routes. However, some public transport routes are near capacity during peak hours, which could impact the development's future transport demand.

6.7.6 Pedestrian and Cycle Infrastructure

Existing pedestrian and cycling facilities are very limited along Mountain Road. Key elements of existing pedestrian infrastructure are:

- An existing footpath of circa 2.0 in width, along the northern kerb of Mountain Road, with the facility running from the R611 / Mountain Road junction west for circa 160m and terminating directly opposite The Monks residential estate. There is no continuous footpath westward past this location, meaning that pedestrians need to currently walk the road to continue onwards along the carriageway.
- An existing footpath on the eastern side of the R611, 2m in width, southward toward the Castle Height link road.

- An uncontrolled crossing across the R611 to the north of Mountain Road.
- A footpath on the western side of the R611, 2m in width, northwards toward the Kilmoney Road Lower.
- Zebra crossings across the R611 to the south of the R611/ Mountain Road.

There is presently a limited amount of cycle infrastructure currently in place in the vicinity of the subject site. This comprises:

- 2no. 2m-wide cycle tracks are insitu along the Castle Heights link road, where cyclists have dedicated cycle facilities on both sides of the road carriageway for 2.2 km until the end of the eastern relief road/ Crosshaven Road Junction.

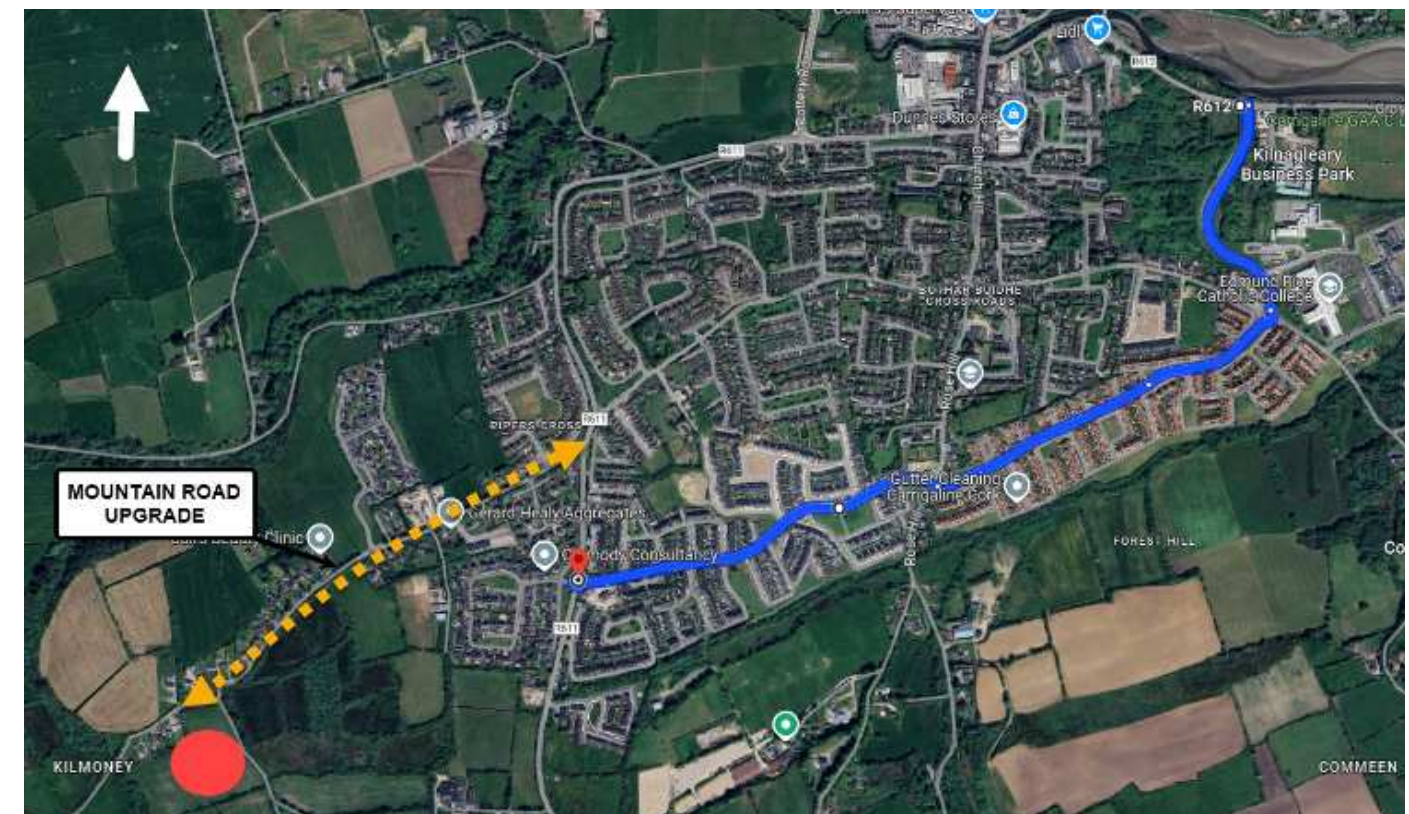


Figure 6.1 Cycle linkages

6.7.7 Future Sustainable Transport

The future of sustainable transport in Carrigaline is poised for significant enhancement through various initiatives outlined in the Cork Metropolitan Area Transport Strategy (CMATS) and other related programs. These initiatives aim to promote environmentally friendly transportation options, reduce traffic congestion, and improve overall accessibility for residents.

- CMATS Implementation: The Cork Metropolitan Area Transport Strategy emphasizes the development of an integrated transport network that prioritizes sustainable modes of travel. This includes expanding public transport services, enhancing walking and cycling infrastructure, and improving connectivity between different transport modes. Carrigaline will benefit from the broader goals of CMATS, which aims to reduce reliance on private cars and encourage public transport use.

- **Public Transport Enhancements:** Plans for improved public transport services include increased frequency and reliability of bus routes serving Carrigaline. The introduction of dedicated bus lanes and priority signalling at intersections will enhance the efficiency of public transport, making it a more attractive option for commuters.
- **Active Travel Infrastructure:** To support walking and cycling, initiatives will include the construction of new pedestrian and cycling paths, as well as the enhancement of existing routes. These upgrades aim to create a safer and more convenient environment for pedestrians and cyclists, encouraging active travel within the community.
- **Electric Vehicle Charging Infrastructure:** As part of the transition to sustainable transport, there will be an expansion of electric vehicle (EV) charging points throughout Carrigaline. This infrastructure will support the adoption of electric vehicles, contributing to reduced emissions and promoting greener transportation options.
- **Mobility Management Programs:** Local initiatives aimed at promoting sustainable transport behaviours, such as carpooling, public transport use, and active travel, will be implemented. These programs may include awareness campaigns and incentives to encourage residents to choose more sustainable travel options.
- **Integration with Regional Transport Plans:** Carrigaline's transport strategy will be aligned with regional and national transport initiatives, ensuring a cohesive approach to sustainability. Collaboration with local authorities and stakeholders will be crucial in achieving long-term transport goals.

The CMATS strategy is supported within the Cork County Development Plan. CCC is also investigating the development of an improved Carrigaline-wide walking and cycling network, which will greatly improve links within the town, and support future developments.

The NTA recently launched a design for the Cork Metropolitan Bus Network in June 2022. The following high quality bus routes will serve the proposed development and are shown below in Figure 6.2:

- Route 3 – Carrigaline PCC to Apple (10-minute frequency)
- Route 3A – Carrigaline PCC to Apple via Ferney Rd/Maryborough Hill (10-minute frequency)
- Route 3B – Carrigaline PCC to Apple via Fuchsoa Ave/Ballinrea Rd (10-minute frequency)
- Route 40 – Fort Camden to Haulbowline (30-minute frequency)

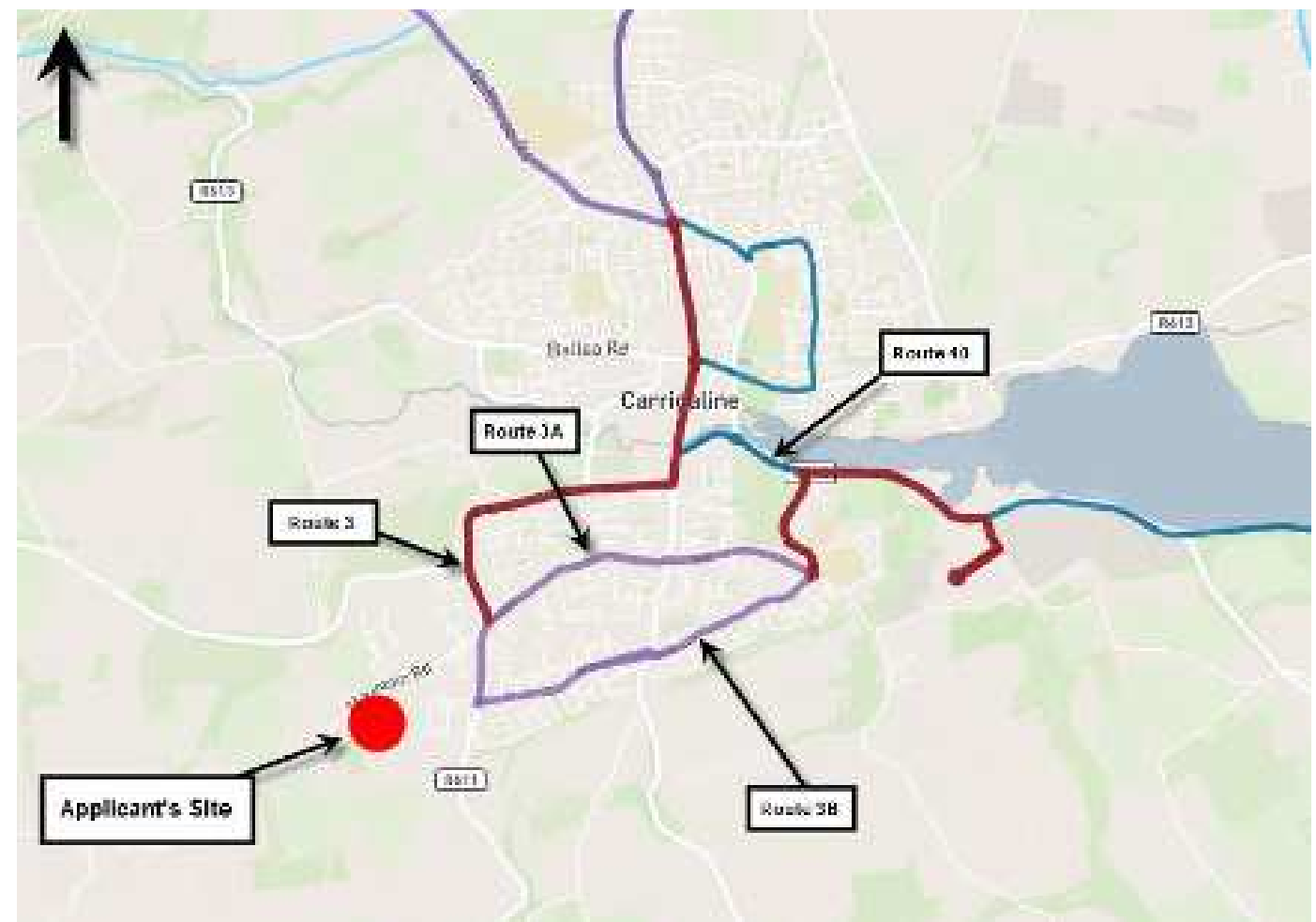


Figure 6.2 New bus services- Carrigaline (Bus Connects - NTA)

6.7.8 Local Road Network

The key roads within the study area are described below.

6.7.8.1 N28

The N28 is a national primary road in Ireland, connecting the city of Cork to the town of Carrigaline and continuing towards the port town of Ringaskiddy. The road is an essential route for both local and regional traffic, facilitating access to residential areas, commercial zones, and significant industrial facilities, including the Port of Cork. The N28 National Road provides the strategic connection through the area, and is accessed via the Shannon park Roundabout, located circa 4km to the north-east of the site.

6.7.8.2 R611

The R611 is single-carriageway road that runs north south to the east of the applicant site, circa 1km from the site entrance of the site. The R611 is a regional road that plays a significant role in the transportation network of Carrigaline. This road connects various local areas and facilitates the movement of traffic, goods, and services within the region. The R611 has a speed limit of 50km/h. Between the R611 and Mountain Road (L6495), the speed limit increases to 60km/h.

6.7.8.3 Mountain Road (L6495)

The Mountain Road is a single-carriageway road that runs east-west past the northern boundary of the site, beginning at the R611, and continuing west past the site. It is a local road that has a speed limit of 60km/h.

Most traffic accessing the site will do so via the R611 / Mountain Road priority junction. Mountain Road forms the minor arm of the junction and is a one lane approach with a short flare with capacity for two cars. There is an uncontrolled pedestrian crossing across the R611, 50m to the north of the R611 junction.

6.7.8.4 Other Roads

Pottery Road/ Western Relief Road

The new Relief Road project improves connectivity to Carrigaline Town Centre with a 750-metre road running parallel to Main Street. Key features include a double-span bridge over the Owenabue River, a 1.5-kilometer cycle track, and over 3 kilometres of footpaths, promoting sustainable transport and pedestrian access. The road connects to Mill Road, adding another 700 meters of urban roadway, enhancing the local infrastructure for current and future traffic needs.

Castle Heights/Forest Hill

This is a single-carriageway road with a speed limit of 50 km/h, featuring segregated footpaths and cycle lanes on both sides. It connects with the eastern relief road, offering an alternative route to the eastern side of the town, enhancing accessibility and promoting safe travel for pedestrians and cyclists.

6.7.9 Baseline Traffic Movements

Current traffic movements in the area are dominated by private vehicle use, with public transport and active travel modes accounting for a smaller proportion of journeys. In order to establish baseline traffic conditions on the local road network, new traffic surveys were undertaken in May 2024. These comprised Junction Turning Count (JTC) surveys at 9 locations.

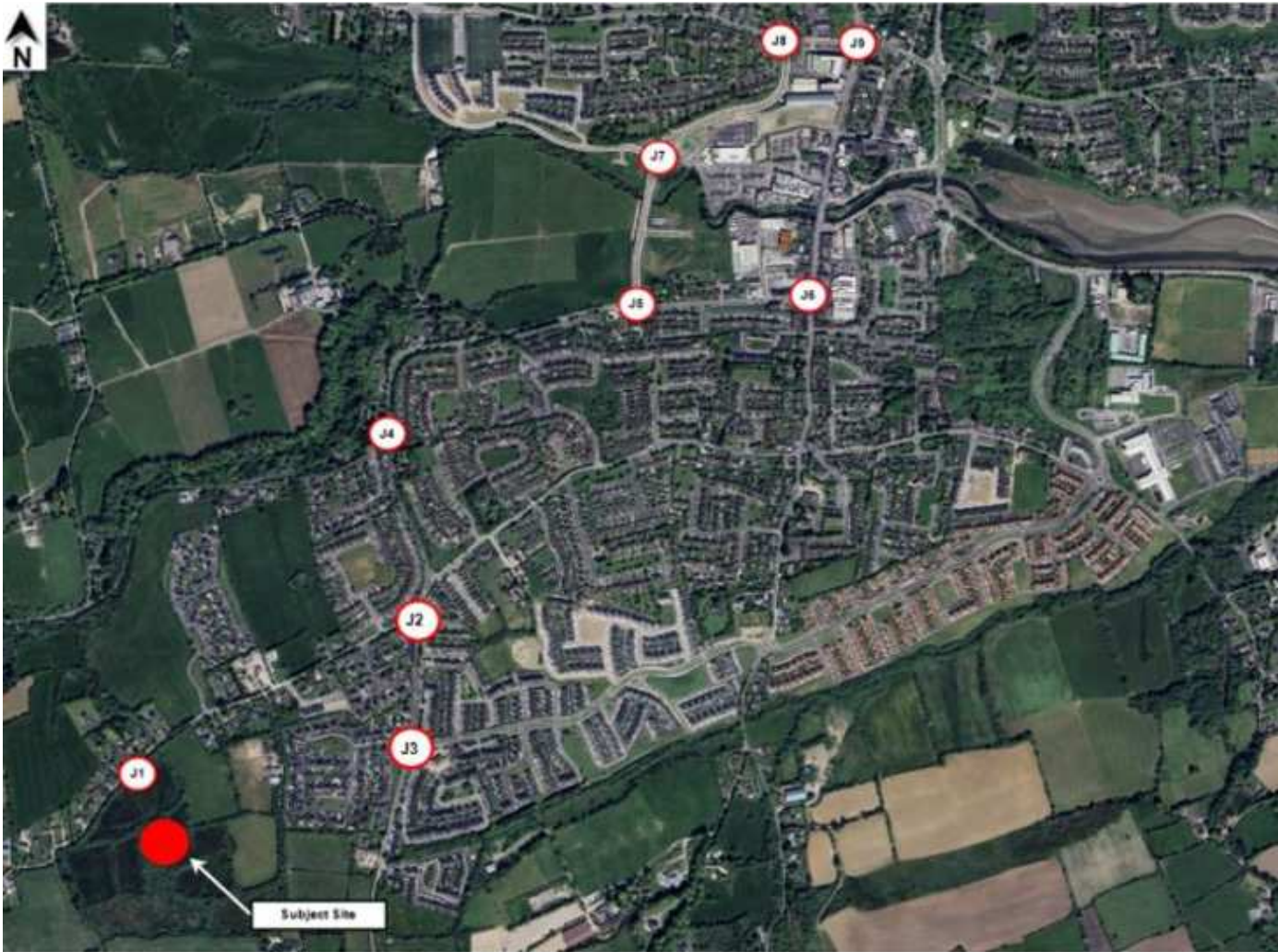


Figure 6.3 JTC and ATC Locations Source: Google Maps

- Junction 1 – Development Access
- Junction 2 – R611/Mountain Road Priority T-Junction
- Junction 3 – R611/Castle Heights/Wheatfields Priority Roundabout
- Junction 4 – R611/Forest Rd Priority T-Junction
- Junction 5 – R611/Pottery Rd Signalised T-Junction
- Junction 6 – R611/Church Hill Priority T-Junction
- Junction 7 – Pottery Rd/ Mill Road
- Junction 8 – Pottery Rd/ Ballea Road
- Junction 9 – Cork Road/ Ballea Road Roundabout

Surveyed AM and PM peak hour traffic flows were converted into AADT using a factor calculated from the TII expansion factors. Vehicle flows across the study area were calculated for the links shown in Figure 6.4.

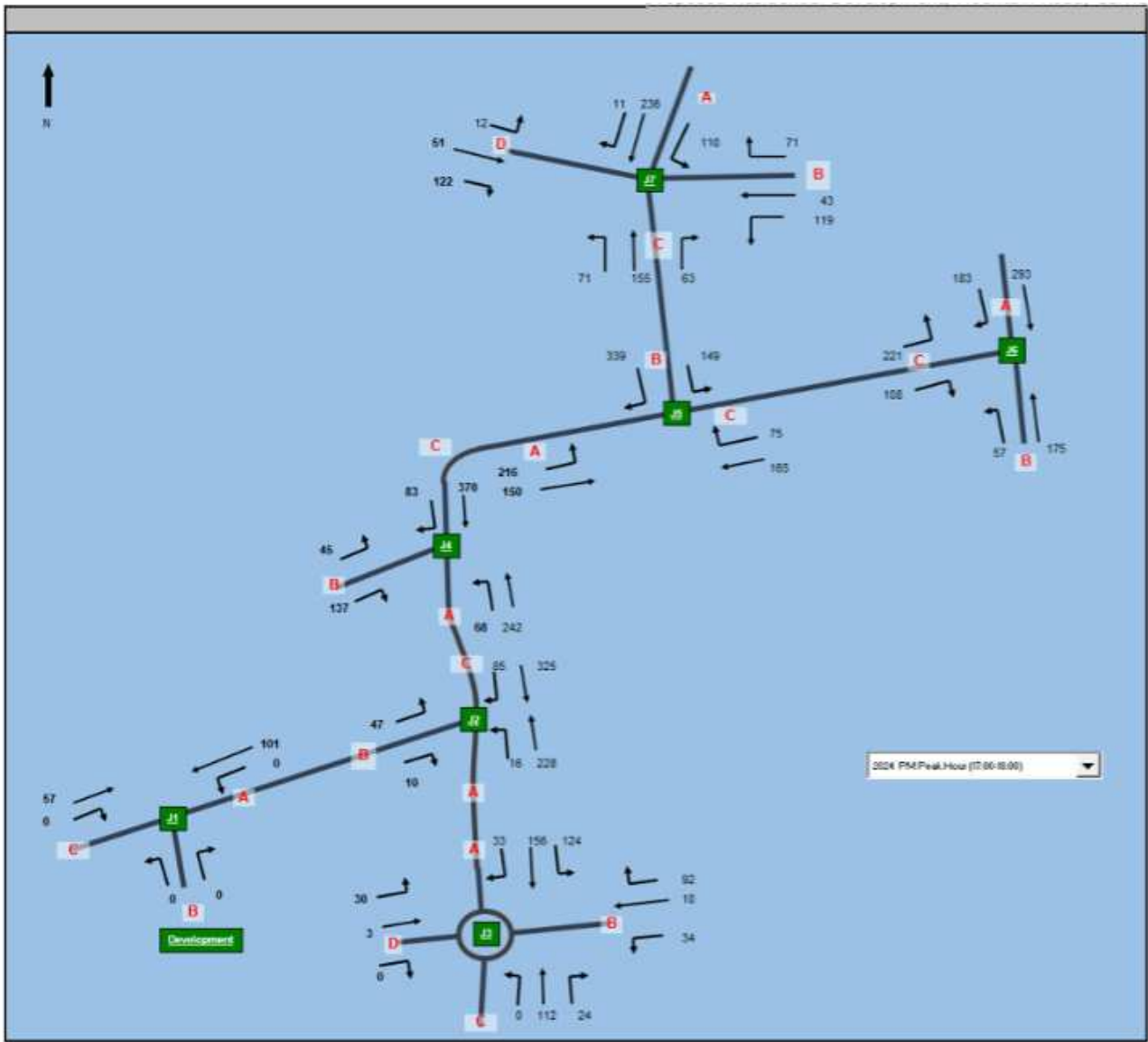


Figure 6.4 Links in the Study Area (PM peak flows)

Table 6.4 displays the calculated Base 2024 Average Annual Daily Traffic (AADT) for each of the links illustrated in Figure 6.4 and additionally highlights the links deemed sensitive to increases in traffic levels. This sensitivity assessment has been conducted by MHL, taking into account the presence of sensitive receptors (such as schools and community facilities) as well as the nature and purpose of the roads.

Table 6.4 2024 Base AADT

Link Ref.	Description	Base 2024 AADT *(2way flow) estimated	Sensitive link (as per IEMA Guidelines)	IEMA Threshold for assessment	Note
1	Mountain Road / Development Access	1500	-	-	-
2	Mountain Road/ R611	6500	Yes	10%	Sensitive as passes through residential area
3	R611 / Castle Heights Priority Roundabout	5100	Yes	10%	Sensitive as passes through residential area
4	R611 / Forest Road Signalised Junction	7000	Yes	10%	Sensitive as passes through residential area
5	R611 / Pottery Road Signalised Junction	7100	Yes	10%	Sensitive as passes through residential area
6	R611 / Church Hill Priority T Junction	8900	Yes	10%	Sensitive as passes through residential area
7	Pottery Road/ Mill Road Access Signalised T Junction	6100	Yes	10%	Sensitive as passes through residential area
8	Pottery Rd/ Ballea Road signalised T junction	9300	Yes	10%	Sensitive as passes through residential area
9	Cork Road/ Ballea Road Roundabout	12500	Yes	10%	Sensitive as passes through residential area

6.7.10 Road Safety

Road safety data from the Road Safety Authority (RSA) indicates that the area has a low accident history, but there are concerns about specific junctions that may require upgrades to accommodate increased traffic.

6.7.11 Future Infrastructural Improvement

The National Planning Framework and local development plans propose several infrastructural improvements, including enhanced cycling infrastructure and public transport upgrades, which are factored into the future scenario analysis.

6.8 The ‘Do Nothing’ Scenario

If the proposed development were not to proceed, the baseline situation would remain largely unchanged, with current traffic patterns, transport infrastructure, and environmental impacts persisting. Evaluating the "do-nothing" scenario involves considering the likely consequences over both temporary (less than 1 year) and short-term (1-7 years) periods.

In the short-term, the absence of development could lead to impacts, such as:

- No additional construction-related traffic: This would avoid temporary increases in traffic congestion, noise, and air pollution typically associated with construction activities.
- Minimal disruption to local residents: With no construction occurring, local communities would experience fewer disruptions from road closures or altered traffic patterns.

However, there are also likely negative impacts, including:

- No infrastructure improvements: The opportunity to improve road networks, pedestrian paths, and cycling lanes would be lost, potentially exacerbating existing traffic congestion and limiting sustainable transport options.
- Continued reliance on car travel: Without the development, sustainable transport initiatives, such as enhanced public transport or walking and cycling infrastructure, may be delayed, reinforcing a car-dependent culture in the area.
- Increased pressure on existing infrastructure: With population growth and urban expansion, the absence of the proposed development may lead to more significant traffic problems in the future, as the existing infrastructure struggles to cope with rising demand.

If the development does not proceed, the current traffic conditions would likely remain unchanged in the short term, with gradual increases in traffic levels due to regional growth. No significant improvements to local transport infrastructure would occur, and existing congestion points would persist. While avoiding the proposed development may result in fewer immediate disruptions, the long-term implications could include missed opportunities for improved transport infrastructure, sustainable travel options, and reduced traffic-related environmental impacts.

6.9 Characteristics of the Proposed Development

A description of the site is provided in 'Chapter 2 – Project Description'. The main features of the site design from a transport perspective are:

- Pedestrian, cycle and vehicular access into the site will be taken from a new priority junction on Mountain Road, which will form the main access into the site. The junction will incorporate an uncontrolled crossings on all arms.
- A network of high-quality walking and segregated cycling routes will be created within the subject site, and an extensive set of measures are in place to reduce vehicle speeds and priority. All proposed road and paths within the development will be designed in accordance with the Design Manual for Roads and Streets (DMURS, 2019) and the NTA's National Cycle Manual 2023.
- The development will contribute to a CCC project to improve the existing footpaths on Mountain Road, between the site access and the R611. This will involve the creation of new sections of footpath, and the widening of existing sections.

The development will be designed to complement and support:

- Future development in the zones lands within the context of Carrigaline/ Mountain Road and the future greenway linkage, the development of which is an objective of the Cork County Development Plan 2022-2028.
- The future transport initiatives set out in CMATS, such as Cork Bus Connects.

6.10 Potential Significant Effects

The proposed development will have direct and indirect traffic-related impacts during both the construction and operational phases. Direct effects include increased traffic volumes, noise, air pollution, and potential road safety risks due to construction vehicles and increased daily trips. Indirect effects involve potential disruptions to the local community's accessibility, impacts on public transport, and cumulative effects on traffic congestion when combined with other developments.

However, the project offers positive impacts, such as improved road infrastructure, enhanced pedestrian and cycling facilities, and alignment with sustainable transport initiatives like CMATS, which support long-term reductions in car dependency. Mitigation measures are expected to minimize negative effects to acceptable levels.

6.10.1 Site Set up Phase

During the site set up phase, there will be a temporary increase in traffic due to the movement of construction vehicles, including heavy goods vehicles (HGVs) transporting debris and materials to and from the site. This could lead to short-term congestion, particularly around access routes and local roads. These impacts are expected to be temporary, lasting only for the duration of these initial activities, and will be managed through the implementation of a Construction Traffic Management Plan (CTMP) to mitigate congestion and parking disruptions, with work parking to be provide on site for the duration of the works.

6.10.2 Construction Phase

The construction phase will generate additional traffic, particularly heavy goods vehicles (HGVs) and worker transport. Road closures and temporary diversions may be required, leading to moderate, short-term impacts.

6.10.2.1 Construction Programme

The overall construction programme will take approximately 60 months to complete.

6.10.2.2 Site Operating Hours

The anticipated working hours on site are as follows:

- Monday to Friday: 7:00 AM – 18:00
- Saturday: 8:00 AM – 16:00

It is proposed that, in exceptional circumstances and with prior approval from the planning authority, working hours may be extended, and work may take place on Sundays and Bank Holidays if critical tasks need to be expedited. Extended working hours may be implemented during scheduled concrete pours. Any request for longer working hours will be coordinated in advance with the planning authority.

6.10.2.3 Vehicle Types

The following types of vehicles (estimated) will be utilized on site during the construction phase:

- Bowsers (2)
- Breakers (1)
- Containers (1)
- Dozers (2)
- Dumpers (2)
- Excavators (3)
- Generators (2)
- Plate Compactors (2)
- Power Washers (1)
- Rollers (1)

There will be no abnormal load movements to the site.

6.10.3 Construction Traffic

Construction traffic will consist of vehicles used by construction workers (cars), LGV’s and HGV’s transporting construction materials. The peak period for HGV movements on site is expected to occur during Phase 2 (construction). During this time, there will be an estimated total of 30 HGV trips to the site (60 two-way movements), with an average arrival rate of 6 HGVs per hour. Additionally, it is anticipated that there may be up to 8 construction workers on site during peak periods of Phase 1a, (site set up), up to 8-50 construction workers on site during peak periods of Phase 1b, (Setting Out of Sites And Provisions Of Services), and there may be up to 100 construction workers on site during peak periods of Phase 2 (Construction Stage of Residential Units). Assuming a conservative occupancy of 2 workers per vehicle, this would result in up to 50 inbound and 50 outbound vehicle trips to the site each day. Travel for construction workers will generally take place outside of peak hours on the local road network, with most operatives arriving before 8:00 AM and departing after the evening peak.

The following table shows the predicted daily percentage impact on the road links on the proposed construction routes, conservatively assuming that all construction traffic travels on each road link.

Table 6.5 Construction Impact

Ref.	Description	DM 2026			Construction Traffic AADF				
		HGV	CAR/ LV	Total	HGV	CAR/ LV	Total	CAR/ LV	Total
1	Mountain Road / Development Access	49	1,607	1,656	60	100	160	6.2%	9.7%
2	Mountain Road/ R611	221	7,275	7,496	60	100	160	1.4%	2.1%
3	R611 / Castle Heights Priority Roundabout	122	6,060	6,182	60	100	160	1.7%	2.6%
4	R611 / Forest Road Signalised Junction	244	9,224	9,468	60	100	160	1.1%	1.7%
5	R611 / Pottery Road Signalised Junction	150	7,637	7,788	60	100	160	1.3%	2.1%
6	R611 / Church Hill Priority T Junction	112	6,974	7,085	60	100	160	1.4%	2.3%
7	Pottery Road/ Mill Road Access Signalised T Junction	30	6,903	6,934	60	100	160	1.4%	2.3%
8	Pottery Rd/ Ballea Road signalised T junction	130	9,770	9,901	60	100	160	1.0%	1.6%
9	Cork Road/ Ballea Road Roundabout	69	11,564	11,634	60	100	160	0.9%	1.4%

Table 6.5 shows that, in terms of overall traffic numbers, the biggest impact will be a 9.7% increase in traffic on Mountain Road, however, within this figure there will be an increase in construction HGV flows. A more detailed assessment of Mountain Road is provided below.

With reference to Table 6.5, the sensitivity of Link 1 to changes in traffic levels is considered to be moderate for construction traffic impacts. The road is a local road with residential properties located on either side of the road, there are no particularly sensitive receptors, such as a school, on the link.

With reference to Table 6.2, the magnitude of change in total traffic on Link 1, Mountain Road, is considered to be moderate. Although the predicted increase is just below the 40% (Minor) threshold, it is considered by MHL that a more conservative assessment is justified in this instance.

When the moderate magnitude of effect is combined with the medium sensitivity of the receptor in accordance with Table 6.3, it can be concluded that there will be a short-term Moderate/ Minor effect during construction stage.

Table 6.6 Severance (without mitigation)

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Mountain Road	Medium	moderate	Moderate/minor

The Construction Traffic Management Plan (CTMP) aims to mitigate the traffic impacts during the construction phase, particularly concerning Heavy Goods Vehicles (HGVs) on Mountain Road. Key measures include scheduling HGV deliveries outside peak traffic hours to reduce congestion, implementing on-site wheel washing facilities and road sweeping to minimize dust and debris transfer, and installing safety signage to warn road users of slow-moving construction traffic.

As a result of these proactive measures, the residual impact on local traffic is expected to be minimal. While there may still be some temporary disruptions due to construction activities, the planned interventions will effectively reduce significant adverse effects, ensuring the safe and efficient movement of traffic in the area. Overall, the CTMP is designed to maintain local road safety and accessibility throughout the construction phase.

Table 6.7 Severance (with mitigation)

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Mountain Road	Medium	minor	Moderate/minor

6.10.4 Haulage Construction Routes

To minimize the impact on the local community, it is proposed to limit HGV deliveries to the most appropriate routes. The recommended access routes are shown in Figure 6.5.

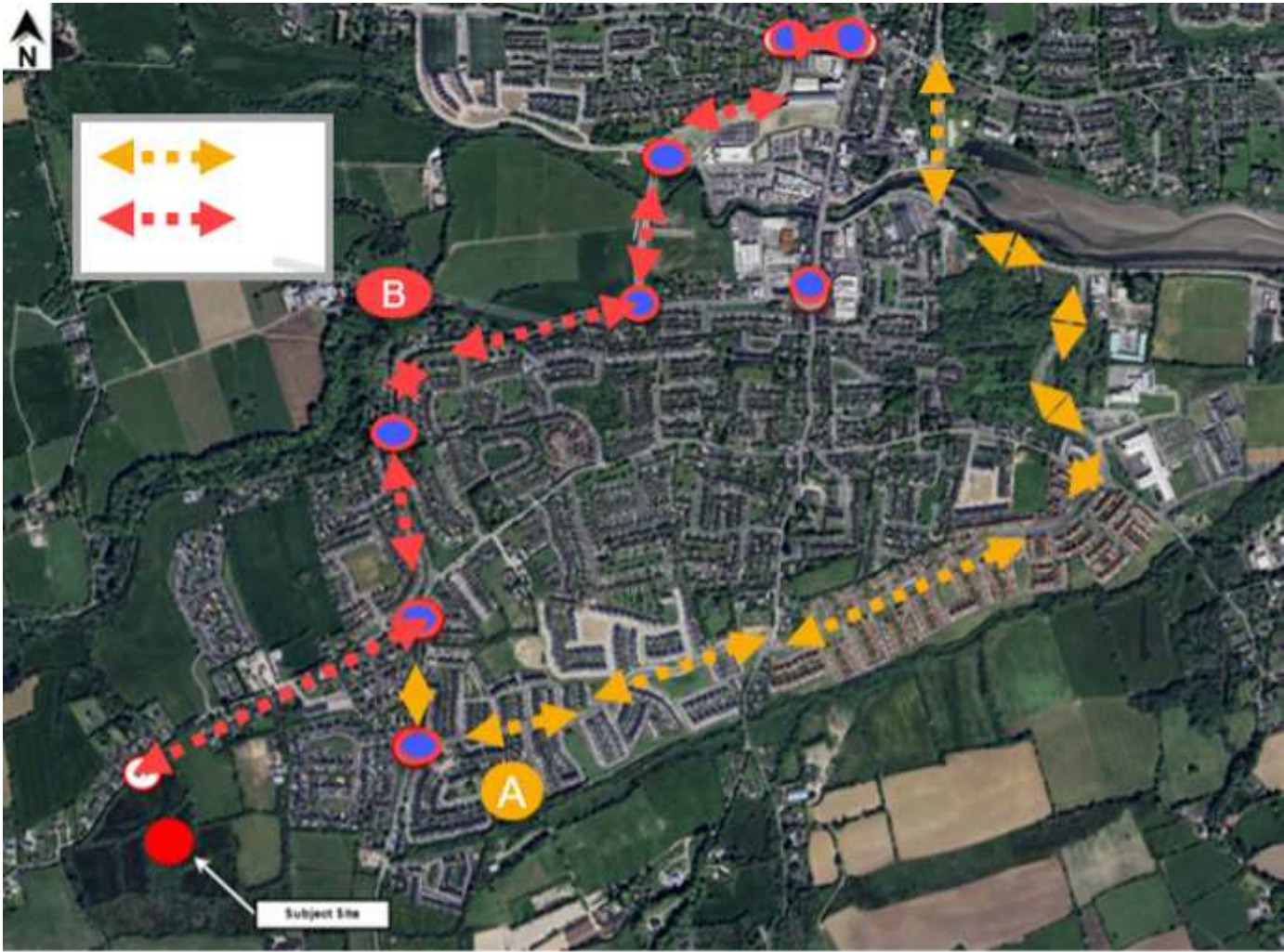


Figure 6.5 Construction Haulage Routes

HGVs will be restricted to the R611 (approaching from both north and south) and Mountain Road (L6495). HGVs will not be allowed to the west of development entrance. The specific details of the proposed construction routing will be agreed upon with CCC prior to the start of construction works, with the national road network being utilized as much as possible. These designated routes can be incorporated into the Contractor’s obligations, and adherence will be ensured through regular observations and monitoring.

6.10.5 Operational Phase

Once operational, the development will generate additional daily trips from residents, employees, and visitors. Increased demand for parking and public transport services is anticipated, as well as potential impacts on local traffic flow.

6.11 Trip Generation

Trip generation analysis for the proposed development was conducted as part of the Traffic and Transportation Assessment (TTA) with the predicted vehicle trip generation based on the development's proposed layout and schedule of areas. These figures were calculated using the mode split from the 2022 Census data, assuming that historical levels of car usage will persist in future years. The TTA also takes into account a modal split aligned with the Climate Action Plan 2024 targets, which aim for a significant shift towards sustainable transportation. In the Carrigaline area, this shift will be facilitated by the implementation of the BusConnects programme. As a result, the figures presented in the TTA provide a highly robust forecast of future traffic volumes. To mitigate operational traffic impacts, improvements to public transport access, incentives for cycling and walking, and parking restrictions will be implemented.

Table 6.8 Predicated Development Trips (Veh)

Proposed Housing Site	Units
Housing Units	318
Apartment Units	44
Total	362

	Student
Creche	102

	AM PEAK		PM PEAK	
	Arrivals	Departures	Arrivals	Departures
Houses				
Peak Trics Trip Rates (<i>per Dwelling</i>)	0.22	0.62	0.54	0.33
Peak Trips <i>for 318 Dwellings</i>	70	197	172	105
Trips Generated	267		277	
Apartments				
Peak Trics Trip Rates (<i>per Apartment Unit</i>)	0.10	0.18	0.12	0.26
Peak Trips <i>for 44 Apartments</i>	4	8	5	11
Trips Generated	12		17	
Creche				
Peak Trics Trip Rates (<i>per Student</i>)	0.46	0.29	0.33	0.50
47	30	34	51	
Trips Generated	77		85	
Total Trips Generated (Arrival/ Departure)	121	235	211	167
Total Trips Generated	356		378	

Table 6.8 shows that during the AM peak hours (08:00 – 09:00), the development is expected to generate a total of 356 two-way vehicle trips. In the PM peak hour (17:00 – 18:00), 378 trips are expected to be generated.

6.12 Traffic Distribution

The new traffic demand generated by the development, has been allocated across the network based on the traffic distribution observed in the 2024 surveys. This methodology is discussed in submitted Traffic and Transportation Assessment (TTA).

6.12.1 Traffic Impact

Traffic flows have been calculated for the following scenarios:

- Do Minimum 2026 (Year of Opening) (without scenario)
- Do Something 2026 (Year of Opening) (with scenario)
- Do Minimum 2031 (Year of Opening +5) (without scenario)
- Do Something 2031 (Year of Opening +5) (with scenario)
- Do Minimum 2041 (Year of Opening + 15) (without scenario)
- Do Something 2041 (Year of Opening + 15) (with scenario)

Background traffic growth, along with traffic from committed developments, has been incorporated into the 2022 survey totals to establish the future year Do Minimum scenarios.

Traffic growth between 2024, 2026, and 2041 has been determined using trip-end totals from the CMATS Regional Traffic Model, which indicates the following growth factors within the Cork Metropolitan area:

- 2022-2026 – 3.5%
- 2022-2041 – 21.6%

These growth factors are considered robust, especially in light of the overarching goals of CMATS and the Climate Action Plan 2024 which aim to reduce traffic levels over the same timeframe.

The increase in traffic resulting from applying this growth is viewed by MHL as a proxy for the traffic generated by developments in the County Development Plan for Carrigaline.

The development contribution to the future year link flows on the wider local road network is shown in Table 6.9.

Table 6.9: AADT Link Flows & Development Contribution (post construction/operational)

Ref.	Road Link	IEMA Threshold	DM 2026	DM 2026 with devt.	Increase	%Impact
1	Mountain Road / Development Access	10%	403	782	379	48%
2	Mountain Road/ R611	10%	1815	2155	340	16%
3	R611 / Castle Heights Priority Roundabout	10%	1580	1638	58	4%
4	R611 / Forest Road Signalised Junction	10%	2413	2698	285	11%
5	R611 / Pottery Road Signalised Junction	10%	2795	3009	214	7%
6	R611 / Church Hill Priority T Junction	10%	2648	2726	78	3%
7	Pottery Road/ Mill Road Access Signalised T Junction	10%	2718	2854	136	5%
8	Pottery Rd/ Ballea Road signalised T junction	10%	3088	3134	46	1%
9	Cork Road/ Ballea Road Roundabout	10%	2047	2097	50	2%

The figures above show that the predicted impacts of the development are below 10% on all links in the study area, with the exception of the section of Mountain Road between the site access junction and the R611 and between Mountain Rd and Forest Rd. A detailed assessment has been undertaken on this link and is presented below.

6.12.2 Severance

6.12.2.1 Description

Severance, as defined by the IEMA Guidelines, refers to the perceived division within a community when major traffic arteries separate neighbourhoods or areas. The potential for the proposed development to cause severance is evaluated individually, relying on professional judgment, particularly when traffic increases are anticipated on roads that pass through residential areas.

Increased severance can lead to the isolation of parts of a settlement or individual properties. This situation may arise from the challenges of crossing heavily trafficked roads or from physical barriers created by those roads themselves. The effects of severance can impact various groups, including residents, motorists, and pedestrians, making it crucial to assess and address these potential consequences during planning and development processes. Effective mitigation measures, such as improved pedestrian crossings, traffic calming features, and community engagement in design, are essential to minimize severance impacts and maintain community connectivity.

6.12.2.2 Assessment

According to Table 6.1, the sensitivity of Link 1 (Mountain Road) to changes in traffic levels regarding severance is deemed low. This is primarily because, despite the presence of residential properties on either side of the road, there are no notable pedestrian attractors that would generate significant crossing demand on Mountain Road.

As indicated in Table 6.2, the anticipated change in total traffic on Link 1 is classified as minor, with increases ranging between 10% and 40%. Additionally, a new pedestrian crossing facility will be implemented at the Mountain Road/Site Access junction, providing a safe crossing option where none currently exists.

By combining the minor magnitude of effect with the medium sensitivity of the receptor as outlined in Table 6.3, it can be concluded that there will be a long-term, minor severance effect. This effect is classified as Moderate/ Minor under the EIA regulations, indicating that the proposed development is not expected to have a meaningful impact on community connectivity in this area in the long term.

Table 6.10 Severance

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Mountain Road	Medium	Minor	Moderate/ Minor
2	Mountain Road/ R611	Medium	Minor	Moderate/ Minor
3	Forest Road/R611	Medium	Minor	Moderate/ Minor

6.12.3 Driver Delay

6.12.3.1 Description

The IEMA Guidelines indicate that delays are considered significant primarily when traffic on the surrounding network is already at or near its capacity. This means that if the existing road system is functioning close to its maximum capacity, any additional traffic introduced by a new development could exacerbate congestion, leading to notable delays. Therefore, the potential for significant delays is closely tied to the current levels of traffic and the overall capacity of the transportation infrastructure in the vicinity of the proposed development.

6.12.3.2 Assessment

Additional delay to non-development traffic may occur at several points on the road network in the vicinity of the subject site, including:

- At the Site access junction, where there will be additional turning movements, and new delay to traffic on Mountain Road
- At the R611 / Mountain Road junction, through which the majority of development traffic will pass.

The sensitivity of Mountain Road to an increased driver delay effect is considered to be medium in accordance with Table 6.1, as there are few alternative routes for east west traffic to use.

With reference to Table 6.2, the magnitude of change in total traffic on Link 1 is considered to be minor as the increase in both is between 10% and 40%. Combining the minor magnitude of the change with the medium sensitivity of the receptor in accordance with Table 6.3 equates to an effect which is classed as long-term, moderate / minor as per the EIA Regulations.

The EIAR assessment is a link assessment that differs from the junction capacity assessment that has been undertaken in the TTA. This assesses the impact at the R611 / Mountain Road junction in detail.

The results show that with the addition of traffic from the development, the Mountain Road arm of the junction is predicted to operate within practical capacity in 2026. The TTA concludes that this level of predicted short-lived congestion is not unusual in an urban setting during the peak hour, and is acceptable, particularly when the robust approach to trip generation that has been adopted is taken into account.

Table 6.11 Driver Delay

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Mountain Road	Medium	Minor	Moderate/ Minor
2	Mountain Road/ R611	Medium	Minor	Moderate/ Minor

6.12.3.3 Description

Traffic volume, composition, speed, and the presence (or lack of) pedestrian footways and crossings all contribute to the level of general pleasantness, fear, intimidation and delay experienced by pedestrians and other vulnerable road users.

6.12.3.4 Assessment

There is an existing footpath of circa 2m in width, alongside the northern kerb of Mountain Road, that runs for a short distance from the R611/ Mountain Road junction.

The sensitivity of Mountain Road to an increased pedestrian delay and amenity is considered to be medium in accordance with Table 6.1. This is in relation to pedestrian amenity, where narrow footways and the close proximity of traffic mean that the pedestrian experience is not particularly pleasant.

With reference to Table 6.2, the magnitude of change in total traffic on Link 1 is considered to be minor as the increase in both is between 10% and 40%. The development will improve footways on Mountain Road between the site access and the R611, which also supports this assessed minor magnitude of change.

Combining the minor magnitude of the effect with the medium sensitivity of the location in accordance with the matrix in Table 6.3, it is considered that increased traffic associated with the proposed development will have a long-term, moderate / minor effect on pedestrian delay and amenity. This effect is assessed as Not Significant in accordance with the EIA Regulations.

Table 6.12 Pedestrian Delay and Amenity

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Mountain Road	Medium	Minor	Moderate/ Minor
2	Mountain Road/ R611	Medium	Minor	Moderate/ Minor

6.12.4 Cumulative Effects

Cumulative impacts have been assessed in conjunction with other planned developments in the area, considering overall growth in traffic demand. These impacts are expected to be moderate to significant, particularly during peak periods.

6.12.4.1 Summary

The key impacts across all phases will be increased traffic volumes, with potential effects on road safety, public transport capacity, and local congestion.

The following table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 6.13 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Increased traffic congestion	Adverse	Moderate	Local	Likely	Short-term	Direct
Noise from construction activities	Adverse	Moderate	Local	Likely	Temporary	Direct
Dust and air quality deterioration	Adverse	Moderate	Local	Likely	Temporary	Direct
Disruption to pedestrian access	Adverse	Minor	Local	Possible	Temporary	Direct
Risk of accidents due to increased HGVs	Adverse	Moderate	Local	Possible	Short-term	Direct

The following table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 6.14 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Increased traffic volume	Adverse	Moderate	Regional	Likely	Long-term	Direct
Air quality impacts from vehicle emissions	Adverse	Moderate	Local	Likely	Long-term	Direct
Noise pollution from increased traffic	Adverse	Moderate	Local	Likely	Long-term	Direct
Effects on local community amenity	Adverse	Minor	Local	Possible	Long-term	Indirect
Increased risk of accidents due to higher traffic levels	Adverse	Moderate	Local	Likely	Long-term	Direct

6.13 Accidents and Safety

6.13.1.1 Description

A high-level calculation has been undertaken to quantify the increased level of accident risk that could be expected due to an increase in traffic associated with the proposed development.

The likelihood of an accident occurring is commonly expressed in terms of ‘accidents per million vehicle- km’. Accidents that are appraised in relation to transport are those in which personal injury is sustained by those involved (personal injury accidents (PIAs)).

6.13.1.2 Assessment

Links 1, between the site access junction and the R611 is 470m in length and can be classified as ‘urban typical single carriageway’ in accordance with the criteria set out within DMRB. Accident rates from the DMRB for this standard of road are:

- Urban typical single carriageway: 0. 844 PIA per million vehicle km.
- The annual calculated increase in PIA as a result of the development is 0. 243 PIA per year, which equates to 2.4 additional PIA over a ten-year period.

In addition, a Stage 1 Road Safety Audit has been carried out at the Mountain Road / Site access junction, and on the footpath proposals on Mountain Road. The RSA considers vehicle, pedestrian and cyclist safety, as well as the safety of other vulnerable road users. This has ensured that the proposed designs provide suitable and safe infrastructure for all users.

Receptor sensitivity for Accident and Safety effects is always considered as high. The assessed magnitude of this effect is negligible. When combined, the effect can be classified as long-term, Minor and Not Significant.

Table 6.15 Accidents and Safety

Link	Description	Sensitivity	Magnitude of Impact	Significance of Effect
1	Mountain Road	Medium	Minor	Moderate / Minor
2	Mountain Road/ R611	Medium	Minor	Moderate / Minor

6.13.1.3 Screening conclusion

In conclusion, all of the impacts of the scheme have been assessed as minor (not significant) in accordance with the EIA Regulations.

6.14 Residual Impact Assessment

This section evaluates the potential significant environmental impacts that may persist after mitigation measures have been applied. Direct effects could include residual traffic increases, such as minor congestion during peak periods, localized noise, and air quality impacts from operational traffic. While these impacts are expected to be minimal, they may still affect nearby residents and local ecosystems, even after the mitigation measures are in place.

Indirect effects might involve long-term changes in traffic patterns, potentially influencing public transport efficiency and accessibility, as well as altering community mobility behaviour. The cumulative impact of increased traffic, when combined with other nearby developments, may contribute to a slight, residual pressure on local infrastructure. However, with mitigation strategies such as improved road design and sustainable transport options, these impacts are expected to remain within acceptable limits, ensuring that the overall environmental impact is minimal.

6.14.1 Construction setup up

After mitigation, residual impacts during the construction set up phase are expected to be minor and short-term.

6.14.2 Construction Phase

Residual impacts during construction are predicted to be moderate but temporary, mainly due to the influx of construction traffic.

6.14.3 Operational Phase

Residual impacts during the operational phase, after mitigation, are expected to be minor to moderate, with the greatest impacts during peak travel times.

6.15 Mitigation Measures

6.15.1 Incorporated Design Mitigation

The design incorporates dedicated cycle lanes, enhanced pedestrian crossings, and traffic calming measures in line with DMURS (2019).

6.15.2 Demolition Phase Mitigation

A detailed traffic management plan will be implemented during demolition, including restricted delivery hours to avoid peak periods and advance notification of road users.

6.15.3 Construction Phase Mitigation

During construction, mitigation measures will include a construction traffic management plan, optimized routing of HGVs, and temporary parking solutions for construction workers.

Traffic impacts during the construction phase will be minimized through the implementation of a Construction Traffic Management Plan (CTMP), which will be agreed upon with CCC. A Framework CTMP, outlining the key principles to be followed, is included as part of the application package.

The following measures will help minimize the impact of HGV traffic on Mountain Road:

- **Scheduled Deliveries:** HGV deliveries will be planned, as much as possible, outside of peak traffic periods, which have been identified as 08:00 – 09:00 and 16:30 – 17:30.
- **Dust and Debris Control:** Wheel washing facilities will be provided on site to reduce the transfer of dust and debris onto local roads. Additionally, a road sweeper will be deployed as needed to ensure the local road network remains clear.
- **Warning Signage:** Signs will be placed along Mountain Road to alert all road users and local residents of the presence of slow-moving and turning HGV traffic. Further warning signs will be installed ahead of the Site Access junction to notify drivers approaching from both directions.

6.15.4 Operational Phase Mitigation

A Mobility Management Plan has also been developed by MHL and is included in the Traffic and Transportation Assessment submitted as part of the planning application. This plan serves as a ‘best practice’ measure to accompany the application. The purpose of the Mobility Management Plan is to reduce the percentage of single-occupancy vehicle trips and address the anticipated transport impacts on the end-users of the site. These mobility measures will also support residents who may choose to live ‘car-free’ by providing a range of sustainable transportation options, thus eliminating the need for car ownership. The measures primarily focus on promoting walking, cycling, and public transport use and can be broadly categorized into the following groups:

- Appointing a Mobility Manager.
- Providing a Welcome Travel Pack for residents.
- Implementing measures to encourage walking, such as clear signage and maps throughout the site.
- Implementing measures to promote cycling, including bike hire hubs on site and cycling signage and maps that indicate travel times to key destinations.
- Encouraging public transport use by collaborating with local bus operators to improve bus scheduling, routes, and school travel options.

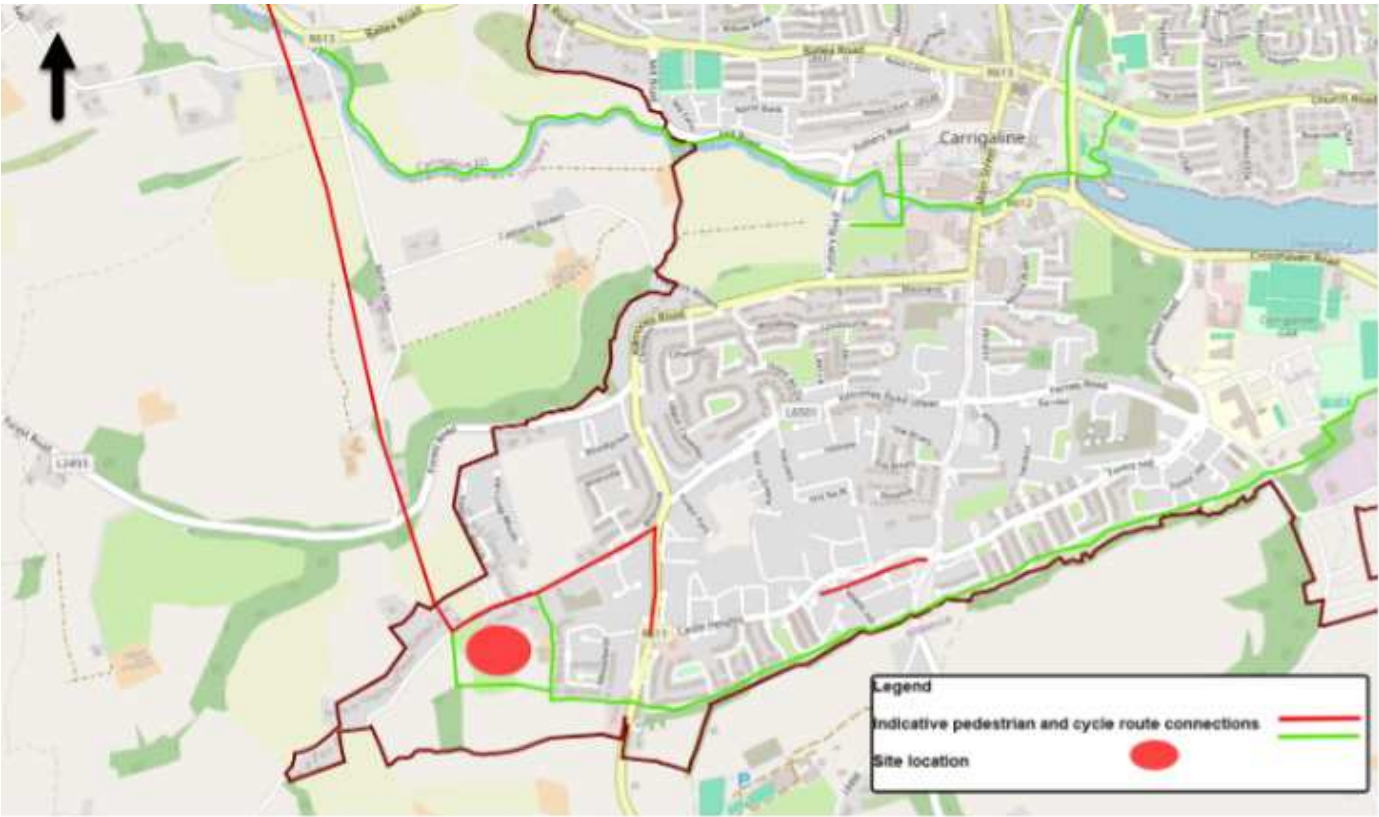


Figure 6.6 Proposed Active Travel Connections in Carrigaline

The development will be designed to complement and support future transport initiatives such as Carrigaline Transportation and Public Realm Enhancement Plan (TPREP) and County Development Plan policy and objective for Carrigaline and the wider area.

6.16 Summary of Post-mitigation Effects

With mitigation in place, most impacts are reduced to acceptable levels, with no significant long-term adverse effects anticipated.

The following table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

- **Quality:** Indicates whether the effect is neutral, positive, or negative.
- **Significance:** Represents the overall importance of the effect post-mitigation.
- **Extent:** Specifies the geographical area affected.
- **Probability:** The likelihood of the effect occurring.
- **Duration:** Refers to how long the effect is expected to last.
- **Type:** Indicates whether the effect is direct or indirect. (Direct effects are immediate, measurable impacts resulting directly from a project’s activities, while indirect effects stem from secondary consequences that can develop over time.)

Table 6.16 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Reduced traffic congestion	Neutral	Minor	Local	Likely	Temporary	Direct
Noise reduction due to noise barriers	Neutral	Minor	Local	Likely	Temporary	Direct
Dust control measures effectively implemented	Neutral	Minor	Local	Likely	Temporary	Direct
Maintained pedestrian access	Positive	Minor	Local	Highly Likely	Temporary	Direct
Improved safety through traffic management measures	Positive	Moderate	Local	Likely	Temporary	Direct

The following table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 6.17 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Improved traffic flow due to road upgrades	Positive	Moderate	Local	Likely	Long-term	Direct
Reduced air quality impacts from enhanced traffic management	Positive	Moderate	Local	Likely	Long-term	Direct
Noise levels maintained within acceptable limits	Positive	Minor	Local	Likely	Long-term	Direct
Enhanced pedestrian safety through improved crossings	Positive	Moderate	Local	Highly Likely	Long-term	Direct
No significant increase in accident rates	Positive	Major	Local	Very Unlikely	Long-term	Direct

6.16.1 Cumulative Residual Effects

Cumulative effects from the development and other local projects are expected to be minor to moderate after the proposed mitigation measures are implemented.

Residual impacts are defined as the effects that are expected to persist after all assessments and mitigation measures have been implemented. These impacts represent the remaining "environmental costs" of a project, reflecting the final or intended effects of a development once mitigation efforts have been applied to minimize or eliminate adverse impacts. The potential residual impacts from the Proposed Development have been taken into account in this environmental assessment.

With the implementation of the Outline Construction Traffic Management Plan (CTMP) and the Mobility Management Plan, the residual impact of the Proposed Development is assessed as "not significant" when considering the development in isolation. Additionally, the proposed Active Travel improvements for the wider area will ensure that the cumulative effects of the development also result in a "not significant" residual impact.



Figure 6.7 Potential construction build out phasing

Estimated development construction build out sequencing:

Sub-Phase A:

- Delivery of residential dwellings.
- Construction of a new priority access junction on Mountain Road (L6495).
- Development of the initial section of the internal access road, serving as the spine road for future estate connection roadways.
- Establishment of a site compound and material enclosure.

Sub-Phase B:

- Extension of the internal access road into the development.
- Construction of residential units on residentially zoned lands.

Sub-Phase C:

- Further extension of the internal access road into the development.
- Construction of residential units on residentially zoned lands.

Sub-Phase D:

- Continued extension of the internal access road into the development.
- Construction of residential units on residentially zoned lands.

Sub-Phase E:

- Further extension of the internal access road into the development.
- Construction of residential units on residentially zoned lands.

Sub-Phase F:

- Final extension of the internal access road into the development.
- Construction of residential units on residentially zoned lands.

The cumulative assessment takes into account how development might proceed on the Mountain Road (L6495) site in future years. It assumes the following:

- Construction of sub phasing/ delivery of yearly unit quantum
- A new access junction on the mountain road, which provides the primary access into the site. The access junction would be delivered in sub phase A, with internal linkages built out as subsequent construction sub phases are built out. A trip distribution from all Phases of the site, with traffic to and from the east using the R611 junction.
- In terms of the initial threshold assessment, the cumulative assessment assumes that the above would be in place from 2031 onwards.

6.17 Risk of Major Accidents or Disasters

The project has been carefully assessed for potential risks of major accidents, with particular attention to its vulnerability to such events. While the nature of the development introduces certain risks, the implementation of comprehensive road upgrades, rigorous safe working practices, and robust mitigation measures significantly minimizes these risks. Enhanced infrastructure will improve traffic flow and reduce the likelihood of accidents, while stringent safety protocols during construction will protect workers and the surrounding community. Furthermore, the incorporation of emergency response plans ensures preparedness for any unforeseen incidents. As a result, the expected significant adverse effects on the environment from potential accidents or disasters are greatly mitigated, reinforcing the project’s commitment to maintaining a safe and sustainable development environment.

The risk of major accidents or disasters related to transport, such as hazardous material spills, is low given the nature of the development. Emergency response plans will be in place and are to be agreed between the appointed contractor and the local authority.

6.18 Worst Case Scenario

The worst-case scenario would involve delays in public transport and road infrastructure upgrades, which could lead to more severe congestion and greater reliance on private car use.

6.19 Interactions

The Traffic and Transport Assessment (TTA) is linked to several other components of the Environmental Impact Assessment Report (EIAR), including sections focused on noise, air quality, and land use planning. This interconnectedness stems from the significant relationship between traffic volumes and their potential environmental consequences. For example, an increase in traffic can lead to heightened noise levels, which may adversely affect local residents and wildlife. Additionally, greater traffic volumes can result in worsened air quality due to higher emissions, posing risks to public health and the environment. Traffic patterns also play a crucial role in land use planning, as new developments can change existing traffic flows, which in turn impacts infrastructure needs and access considerations. By taking these interrelated aspects into account, the EIAR facilitates a thorough evaluation of the overall effects of the proposed development on both the environment and the well-being of the community. Please consult the relevant chapter of the Environmental Impact Assessment Report (EIAR) for additional details and information regarding the development assessment and subsequent findings.

6.20 Monitoring

Traffic conditions will be monitored post-construction to ensure that mitigation measures are effective, with adjustments made as needed in collaboration with local authorities.

6.21 Summary of Mitigation and Monitoring

A comprehensive set of mitigation and monitoring measures has been proposed to minimize the development’s impact on traffic and transport, focusing on all phases of the project.

The following table summarises the construction phase mitigation and monitoring measures.

Table 6.18 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Increased Traffic Congestion	- Schedule construction traffic outside peak hours.	- Regular monitoring of traffic flow and congestion levels.
Noise Pollution	- Implement noise barriers and limit construction hours.	- Conduct noise level assessments at sensitive receptors.
Dust and Air Quality Degradation	- Employ dust suppression techniques (e.g., water spraying).	- Monitor air quality at nearby residential areas.
Disruption to Pedestrian Access	- Establish clear signage and detours for pedestrians.	- Conduct regular checks to ensure pedestrian routes are safe.

The following table summarises the Operational Phase mitigation and monitoring measures.

Table 6.19 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Increased Traffic Volume	- Implement a Mobility Management Plan to promote sustainable transport options.	- Monitor traffic volumes and patterns post-implementation.
Improved Public Transport Access	- Enhance public transport services and facilities (e.g., bus stops, shelters).	- Survey public transport usage and satisfaction regularly.
Pedestrian and Cyclist Safety	- Install pedestrian crossings, bike lanes, and safety signage.	- Conduct regular safety audits and monitor accident reports.
Reduced Air Quality Issues	- Encourage use of electric vehicles and provide EV charging stations.	- Monitor air quality at key locations near the development.
Noise Levels Near Sensitive Areas	- Implement noise-reduction measures (e.g., sound barriers, landscaping).	- Regularly measure noise levels near sensitive receptors.

6.22 Conclusion

The assessment has found that there will no significant negative impact in terms of Traffic and Transportation post construction. The proposed development will have some traffic and transport impacts, but with effective mitigation measures in place inclusive of the upgrade of Mountain Road (L6495) as proposed, these impacts are not expected to be significant in the long term. The development aligns with national and regional transport policies aimed at promoting sustainable transport modes.

6.23 References and Sources

- Environmental Protection Agency (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports.
- Institute of Environmental Management and Assessment (IEMA) Guideline: ‘Environmental Assessment of Traffic and Movement (IEMA, 2023).
- Government of Ireland, Project Ireland 2040 – National Planning Framework.
- Project Appraisal Guidelines for National Roads Unit 5. 1 - Construction of Transport Models, October 2016, TII.
- Project Appraisal Guidelines for National Roads Unit 5. 3 – Travel Demand Projections, October 2016, TII.
- Transport Infrastructure Ireland (TII) (2014), Traffic and Transport Assessment Guidelines.
- National Cycle Manual (NTA, 2023).
- National Transport Authority (2014). Traffic Management Guidelines. Available at: <https://www.nationaltransport.ie/>
- Department of Housing, Local Government and Heritage (2021). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment. Available at: <https://www.gov.ie/en/publication/43a5d-guidelines-for-planning-authorities-and-an-bord-pleanala-on-carrying-out-environmental-impact-assessment/>

- Cork City Council & Cork County Council (2019). Cork Metropolitan Area Transport Strategy. Available at: <https://www.corkmetropolitanareatransportstrategy.ie/>
- Transport Infrastructure Ireland (n.d.). Design Manual for Urban Roads and Streets. Available at: <https://www.tii.ie/>
- Cork Metropolitan Bus Network. National Transport Authority (NTA), June 2022
- Carrigaline Transportation and Public Realm Enhancement Plan (TPREP).
- Climate Action Plan 2024.

CHAPTER SEVEN

MATERIAL ASSETS:
BUILT SERVICES



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER SEVEN

Table of Contents

Material Assets: Built Services

7.1 Introduction 7-1

7.2 Expertise & Qualifications 7-1

7.3 Proposed Development 7-1

7.4 Methodology 7-2

7.5 Difficulties Encountered 7-3

7.6 Baseline Environment 7-3

7.7 The ‘Do Nothing’ Scenario 7-5

7.8 Potential Significant Effects 7-5

7.9 Mitigation Measures 7-8

7.10 Residual Impact Assessment 7-10

7.11 Risk of Major Accidents or Disasters 7-12

7.12 Worst Case Scenario 7-12

7.13 Interactions 7-12

7.14 Monitoring 7-12

7.15 Summary of Mitigation and Monitoring 7-12

7.16 Conclusion 7-13

7.17 References and Sources 7-13

Table of Tables

Table 7-1 Summary of Construction Phase Likely Significant Effects
in the absence of mitigation..... 7-8

Table 7-2 Summary of Operational Phase Likely Significant Effects
in the absence of mitigation..... 7-8

Table 7-3 Summary of Construction Phase Effects Post Mitigation 7-12

Table 7-4 Summary of Operational Phase Effects Post Mitigation..... 7-12

Table 7-5 Summary of Construction Phase Mitigation and
Monitoring 7-13

Table 7-6 Summary of Operational Phase Mitigation and
Monitoring 7-13

Table of Figures

Figure 7-1 - Extract from OPW Drainage Maps (Site Boundary
Indicative Only) 7-3

Figure 7-2 - Extract from Uisce Éireann Network Plans (Site
Boundary Indicative Only) 7-4

Figure 7-3 - Extract from Uisce Éireann Network Plans (Site
Boundary Indicative Only) 7-4

Figure 7-4 - Extract from ESB Drawing 20241015_029 (Site
Boundary Indicative Only) 7-5

CHAPTER SEVEN | Material Assets: Built Services

7.1 Introduction

Material assets are resources that are valued and intrinsic to the site of the proposed development and the surrounding area. These may be of either natural or human origin and the value may arise for economic or cultural reasons. This chapter considers and assesses the effects of the proposed development on the material assets, including the existing major utilities within and around the site, during the construction and operational phases.

In relation to material assets, the EPA (2022) Guidelines on the information to be contained in the Environmental Impact Assessment Reports states that:

“In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes transport infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.”

In this instance ‘built services’ is taken to mean surface water drainage, foul water drainage, water supply and utilities (electricity, gas and telecommunications) infrastructure in the receiving environment. Traffic-related impacts have been addressed under the scope of Chapter 6 (Material Assets: Traffic & Transport). Water quality and other hydrological / hydrogeological impacts of the proposed development have been assessed under the scope of Chapter 10 (Water & Hydrology).

7.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Ben Mong CEng MIEI, Senior Civil Engineer at OSL Butler Consulting Engineers.

Ben Mong holds a Bachelor of Engineering Degree and is a Chartered Engineer with Engineers Ireland with 15 years’ experience in planning, designing and directing the construction of developments in Ireland and South Africa, including large-scale residential development projects and EIAR’s.

Ben Mong has carried out Material Assets: Built Services assessments and been involved in the preparation of EIARs for the following projects:

- Hacketstown Strategic Housing Development, Skerries, County Dublin
- Murphystown Way Large-scale Residential Development, Dublin 18, County Dublin
- Ballygossan Park Large-scale Residential Development, Skerries, County Dublin

7.3 Proposed Development

A full development description can be found in Chapter 2 of this EIAR.

To summarise, the applicant seeks permission for the following Large Scale Residential Development (LRD) comprising the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

7.3.1 Aspects Relevant to this Chapter

7.3.1.1 Surface Water Drainage

It is proposed to service the proposed development by means of a connection to an existing 300mm diameter surface water pipe located to the north of the site. This surface water pipe crosses Mountain Road, and eventually discharges into an existing stream running along Forest Road.

The proposed development has been sub-divided into 10 smaller sub-catchments. These sub-catchments attenuate and control the discharge generated within to QBAR. Surface water run-off from the proposed development will be discharged, after attenuation and control, to QBAR.

The site’s surface water management infrastructure has been designed in accordance with the Greater Dublin Strategic Drainage Study 2005 (GDSDS).

Proposed surface water drains have been designed in accordance with the Greater Dublin Strategic Drainage Study 2005 (GDSDS), Greater Dublin Regional Code of Practice (V6), the Department of the Environment’s “Recommendations for Site Development Works for Housing Areas” (1998), the Department of the Environment’s Building Regulations “Technical Guidance Document Part H Drainage and Waste Water Disposal” and BS EN 752: 2008 “Drain and Sewer Systems Outside Buildings”.

Sustainable drainage systems (SuDS) features incorporated in the design include green roofs, tree pits, swales, ponds, percolation areas, petrol interceptors and flow control devices in accordance with CIRIA publication C753 SuDS Manual. These design features will aid in managing rainwater close to where it falls, allow rainwater to soak into the ground, promote evapotranspiration, slow down and store runoff, treat runoff to reduce contamination through pollution prevention and controlling the runoff at source and reduce the risk of urban contaminants causing environmental pollution.

The proposed surface water drainage design has been discussed in more detail within the Engineering Services Report submitted as part of this application, under separate cover.

7.3.1.2 Wastewater Drainage

It is proposed that this development will be serviced internally by 150mm and 225mm diameter foul sewers and will include the provision of services connections, inspection chambers etc. throughout the site. Due to the topography of the site, a portion of the site will require pumping.

As part of the Uisce Éireann confirmation of feasibility received under CDS24001434, an upgrade is required to the existing foul sewer network to accommodate the proposed site. The aforementioned upgrade works includes a 300mm diameter foul sewer to be installed from the proposed development and connecting to the existing foul sewer in the R611 (Kilmoney Lower Road).

Foul sewers have been designed and will be constructed in accordance with the Uisce Éireann ‘Standard Details for Wastewater infrastructure’ and ‘Code of Practice for Wastewater Infrastructure’. In addition, foul sewers have been designed to the Building Regulations 1997, as amended, (referred to within as ‘the Building Regulations’) and specifically in accordance with the principles and methods set out in EN 752:2008 and DOE ‘Recommendations for Site Development Works’ (1998). In addition, HR Wallingford ‘Tables for the Hydraulic Design of Pipes, Sewers and Channels’ and Water UK/WRC ‘Sewers for Adoption – 6th Edition’ have been applied.

7.3.1.3 Water Supply

It is proposed that this development will be serviced by 150mm and 100mm diameter watermains and will include the provision of new fire hydrants and relevant infrastructure throughout the site.

As part of the UE confirmation of feasibility received under CDS24001434, an upgrade is required to the existing water network to accommodate the proposed site. The aforementioned upgrade works includes a 150mm diameter water main to be installed from the proposed development and connecting to the existing water main in the R611 (Kilmoney Lower Road).

All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Uisce Éireann ‘Standard Details for Water Infrastructure’ and ‘Code of Practice for Water Infrastructure’ and the Department of the Environment’s Building Regulations “Technical Guidance Document B - Fire Safety (2020)”.

7.3.1.4 Electrical Supply

In order to facilitate the new development the proposal is to install new electrical services to serve the houses and apartments. This involves the following:

- Rerouting the overhead lines underground.
- New Unit Substations.
- New underground ducting and electrical infrastructure to serve the development.
- New underground ducting and electrical infrastructure to serve the development lighting.

7.3.1.5 Gas Supply

It is not proposed that gas is provided to the houses and apartments in the development.

7.3.1.6 Telecommunications

In order to facilitate the new development, the proposal is to install new underground ducting and telecommunications infrastructure to serve the houses and apartments.

7.4 Methodology

As part of assessing the likely impact of the proposed development, surface water runoff, foul drainage discharge and water usage calculations were carried out in accordance with the relevant legislation and guidelines as set out below.

7.4.1 Relevant Legislation & Guidance

- Greater Dublin Strategic Drainage Study 2005 (GDSDS)
- Uisce Éireann Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03, July 2020, Revision 2)
- Uisce Éireann Code of Practice for Water Infrastructure (IS-CDS-5020-03, July 2020, Revision 2)

- Guidelines on the Information to be Contained In Environmental Impact Assessment Reports (May 2022) published by the EPA
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU, 2017) published by the European Commission

7.4.2 Site Surveys/Investigations

Assessment of the potential impacts of the proposed development on existing material assets in the vicinity of the site included:

- Review of Uisce Éireann utility plans (surface water drainage, foul drainage and water supply).
- Consultation with Uisce Éireann and Cork County Council.
- Submission of a Pre-Connection Enquiry Application to Uisce Éireann.
- Submission of proposed designs to Uisce Éireann for Design Vetting Assessment.
- Review of ESB Networks Utility Plans.
- Review of Gas Networks Ireland Service Plans.
- Review of Eir E-Maps.
- Review of Virgin Media Maps.
- Site Investigation Desk Study by Priority Geotechnical (P24187_Rp_F01, December 2024)

7.4.3 Consultation

As part of the design development and planning application processes, consultations have been held with Uisce Éireann, Cork County Council and Inland Fisheries Ireland in relation to utilities infrastructure.

A pre-connection enquiry was submitted to Uisce Éireann in relation to the water and wastewater strategy for the proposed development. A confirmation of feasibility (CoF) letter was received from Uisce Éireann in October 2024, stating the following:

“Water Connection – Feasible Subject to upgrades: In order to accommodate the proposed connection, approximately 600m of water network upgrades will be required to provide additional network capacity. Uisce Éireann does not currently have any plans to undertake these works, therefore the applicant will be required to fund these local network upgrades. The fee for these works will be calculated at a connection application stage.”

“Wastewater Connection – Feasible Subject to upgrades: In order to facilitate the proposed connection at the Development, the Uisce Éireann sewer network will have to be extended by approximately 170m to the Development boundary. Uisce Éireann currently does not have any plans to extend its network in this area. These works will be carried out by Uisce Éireann and the costs for this will be included in your connection fee. Please see www.water.ie/connections/ for information on connection charges.

In addition to the required network extension, approximately 690m of sewer network upgrades will be required to provide the necessary additional network capacity for the proposed.

Development loading. Uisce Éireann does not currently have any plans to undertake these works, therefore the applicant will be required to fund these local network upgrades. The fee for these works will also be calculated at a connection application stage.”

The proposed water and wastewater drainage scheme for the development has been submitted to Uisce Éireann for Design Acceptance (Reference No. CDS24001434).

Preliminary discussions have been held with Area Engineers for both ESB & EIR to confirm adequate capacity is available in relation to this development.

7.5 Difficulties Encountered

No major or particular difficulties were encountered in preparation of this chapter.

7.6 Baseline Environment

7.6.1.1 Surface Water Drainage

Context and Character:

The site of the proposed development is greenfield in nature in respect of surface water drainage. The existing lands currently drains by means of a series of sod and stone ditches linking with the surrounding informal ditch regime. There is an existing 300mm diameter surface water pipe to the north of the site, crossing Mountain Road, and eventually discharges into an existing stream running along Forest Road.

The location of this existing surface water drainage is shown on the OPW Drainage Maps (refer to Figure 7-1 below) as well as within the relevant civil engineering layouts submitted as part of this application, separately.

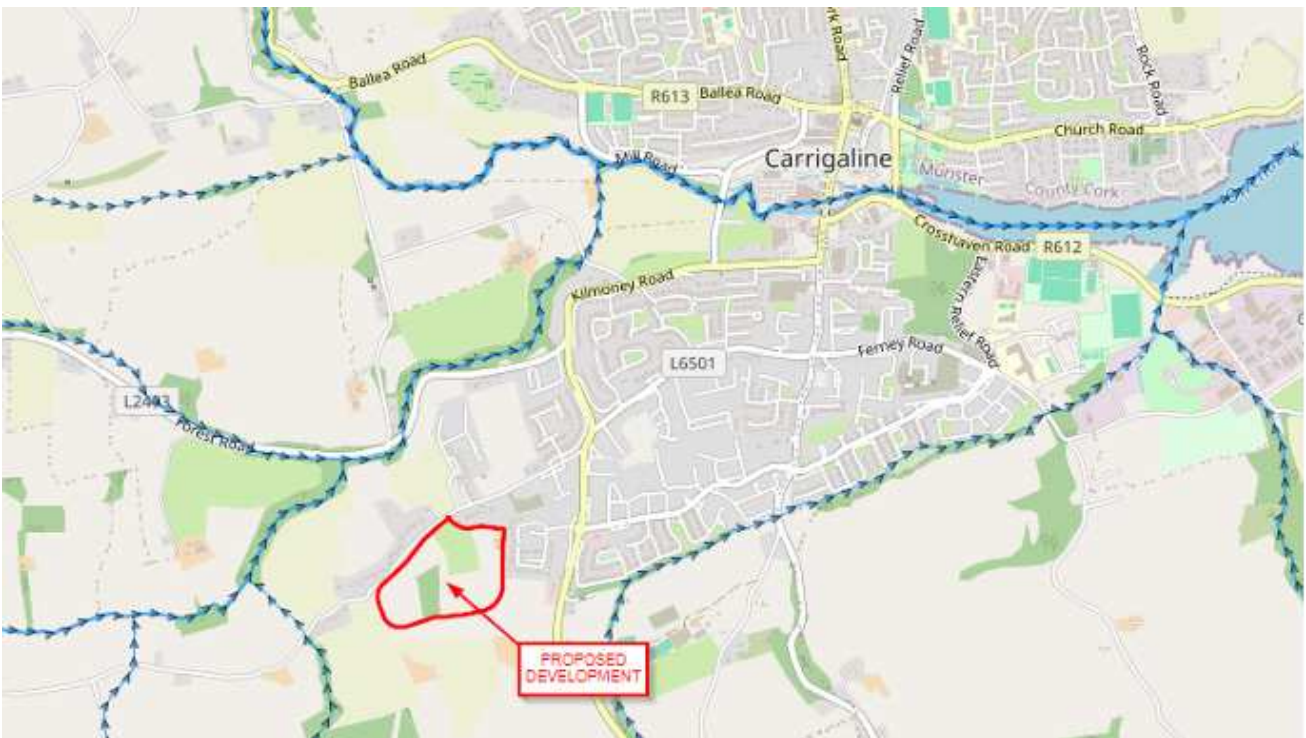


Figure 7-1 - Extract from OPW Drainage Maps (Site Boundary Indicative Only)

Sensitivity:

Surface water drainage systems generally can be sensitive to changes in their design, installation, and maintenance. Factors that can affect the sensitivity of surface water drainage systems include:

- Changes in land use, such as urbanisation, can increase the number of impervious surfaces, such as roads and buildings, which can lead to increased stormwater runoff and reduced infiltration into the soil.
- The type of soil in a particular area can affect the ability of a drainage system to manage stormwater runoff effectively. For example, soils with high clay content may have a low infiltration capacity and can cause waterlogging and flooding.
- Proper maintenance of drainage systems, such as regular cleaning of catch basins and culverts, is essential to ensure their functionality and prevent clogging and blockages.
- Human errors and accidents such as excavation or equipment failure can cause damage to the system. Misconnection of wastewater drainage pipework can cause wastewater to enter the surface water drainage system.
- Climate change may cause changes in precipitation patterns and increased frequency of extreme weather events which can impact the sensitivity of surface water drainage systems.

Overall, surface water drainage systems are Moderately Sensitive to changes. The River Waterbody Owenboy (Cork)_40, and Transitional Waterbody, Owenboy Estuary, approximately 2km to the northeast of the subject lands is a receiving environment for surface water runoff from the site and is potentially Significantly Sensitive to changes in the nature of surface water runoff from the site.

A flood risk assessment of the site has been performed by OSL Butler Consulting Engineers and included as part of this application under sperate cover. The assessment concludes that the risk of flooding at the site is not significant and that the development of the site will not result in a significant increase in the risk of flooding at the site or elsewhere as a result of the development.

7.6.1.2 Wastewater Drainage

Context and Character:

There is an existing 225mm diameter foul line within Mountain Road, approximately 300m to the east of the proposed development entrance. This existing foul line services the lands adjacent to Mountain Road.

This existing foul line connects to a 375mm diameter foul sewer located approximately 625m to the east of the site in Kilmoney Road (R611). These sewers drain north eastwards towards the pump station (Crosshaven Road WWPS Ringaskiddy) located at Carrigaline Main Road (adjacent to Carrigaline Library). The rising main from the aforementioned pump station discharges to an existing 525mm dia foul line to the south.

The existing foul sewer infrastructure has been deemed suitable, with upgrades, by Uisce Éireann. This is further discussed in the headings that follows.

The location of this existing foul sewer is shown on Uisce Éireann Network Plans (refer to Figure 7-2 below) as well as within the relevant civil engineering layouts submitted as part of this application, separately.

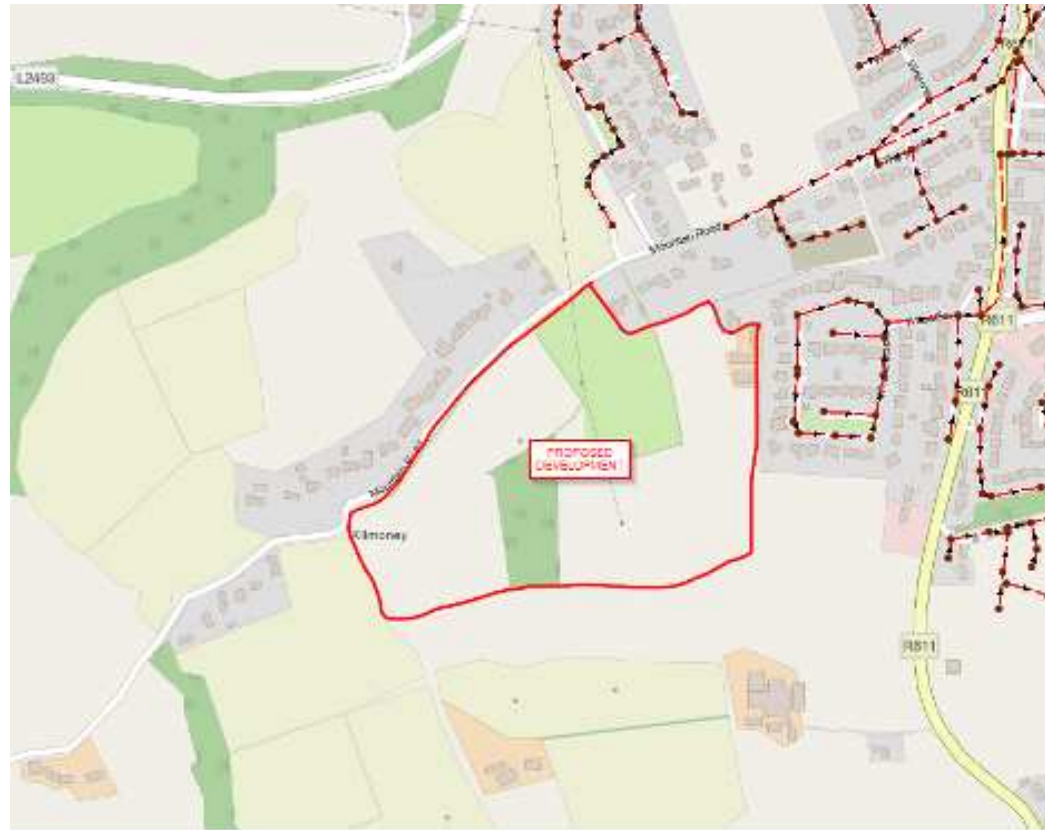


Figure 7-2 - Extract from Uisce Éireann Network Plans (Site Boundary Indicative Only)

Sensitivity:

Foul drainage systems can be sensitive to changes in their design, installation, and maintenance. The performance of a foul drainage system can be affected by various factors, including:

- Damage or breakage of the existing Uisce Éireann wastewater drainage services on site has the potential to disrupt existing wastewater drainage services locally.
- Changes in the flow rate of wastewater can impact the system's ability to transport wastewater to the treatment plant. High flow rates can cause blockages and overflows, while low flow rates can cause sedimentation and accumulation of solids. Misconnection of surface water drainage systems can cause hydraulic overloading of wastewater drainage systems in periods of heavy rainfall.
- The size and slope of the pipes can affect the velocity and capacity of the wastewater transport, which can impact the system's ability to function effectively.
- The type of pipe materials used can affect the durability and lifespan of the system. Some materials may corrode over time or be susceptible to damage from tree roots or ground movements.
- Regular maintenance of the foul drainage system is essential to prevent blockages, leaks, and other issues that can impact the system's performance.
- Human errors and accidents such as excavation or equipment failure can cause damage to the system.

- Changes in land use, such as new developments or industrial activities, can increase the volume and strength of wastewater, which can impact the system's ability to handle the additional load.
- Changes in climate conditions, such as heavy rainfall or drought, can impact the flow rates and capacity of the foul drainage system.

7.6.1.3 Water Supply

Context and Character:

There is an existing 100mm diameter Asbestos watermain located in Mountain Road. This main is serviced/supplied via the existing network located in Kilmoney Road (R611).

The existing foul sewer infrastructure has been deemed suitable, with upgrades, by Uisce Éireann. This is further discussed in the headings that follows.

The location of this existing water infrastructure is shown on Uisce Éireann Network Plans (refer to Figure 7-3 below) as well as within the relevant civil engineering layouts submitted as part of this application, separately.



Figure 7-3 - Extract from Uisce Éireann Network Plans (Site Boundary Indicative Only)

Sensitivity:

Water systems can be sensitive to changes in their design, installation, and maintenance. Factors that can affect the sensitivity of water systems include:

- The quality of the water source, such as rivers, lakes, or groundwater, can affect the treatment processes required to produce safe drinking water. Changes in source water quality due to natural or human-caused factors can impact the quality of water provided to the site.
- Aging water infrastructure, such as pipes, valves, and treatment facilities, can become vulnerable to leaks, breaks, and other failures that can impact the ability to provide quality water supply.
- Human errors and accidents such as excavation damage or equipment failure can cause leaks or supply interruptions.
- Contamination incidents, such as chemical spills or microbial outbreaks, can impact the quality of water servicing systems and threaten public health.
- Increased demand for water can result in reduced water pressure for existing customers.
- Climate change can affect the quantity and quality of water resources, as well as impact the reliability of water infrastructure during extreme weather events such as floods and droughts

7.6.1.4 Electrical Supply

Context and Character:

The existing site has overhead electrical lines, Medium Voltage (10kV/20kV), across the site. The location of this existing ESB infrastructure is shown on ESB Network Plans (refer to Figure 4 below)



Figure 7-4 - Extract from ESB Drawing 20241015_029 (Site Boundary Indicative Only)

Sensitivity:

The proposed installation will be cable based within an underground ductwork system and will have low sensitivity.

7.6.1.5 Gas Supply

There are no existing gas supply lines located within the proposed development boundary.

7.6.1.6 Telecommunications

Context and Character:

There is no existing telecommunication services located within the proposed development boundary.

Sensitivity:

The proposed installation will be cable based within an underground ductwork system and will have low sensitivity.

7.7 The 'Do Nothing' Scenario

In the do-nothing scenario (i.e. assuming the proposed development were not progressed), the built services and infrastructure at the site of the proposed development and in the immediate vicinity would likely remain as they are at present (greenfield, previously agricultural). No likely significant effects would arise in relation to material assets in this scenario.

7.8 Potential Significant Effects

7.8.1 Demolition Phase

The potential significant effects associated with the Material Assets - Built Services during the demolition phase of this development is insignificant.

7.8.2 Construction Phase

The potential significant effects associated with the Material Assets - Built Services during the construction phase of this development has been summarised below.

7.8.2.1 Surface Water Drainage

New surface water drainage systems will be constructed on site to service the development, connecting to existing surface water drainage infrastructure in the receiving environment.

Potential Direct effects of the construction phase on surface water drainage systems are:

- uncontrolled and/or misdirected surface water runoff to existing watercourses and drainage systems and to adjacent lands;
- Transmission of entrained soils/turbidity, construction materials and spilt liquids including hydrocarbons and other pollutants.

In the absence of mitigation measures the **Direct** impact of the construction phase on surface water drainage is **Negative** in quality, **Significant** in terms of significance, **Likely** in probability and **Medium-term** in duration.

Potential Indirect, Secondary and Cumulative impacts of the construction phase on surface water drainage systems are:

- Loss of hydraulic performance and increased frequency of flooding caused by siltation of existing drainage systems.
- Erosion of existing watercourses and surrounding lands causing loss of soil stability and consequent further erosion.
- Reduction in Biodiversity

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on surface water drainage services is **Negative** in quality, **Significant** in terms of significance, **Likely** in probability and **Medium-term** in duration

7.8.2.2 Wastewater Drainage

New wastewater drainage systems will be constructed on site to service the new development, connecting to existing wastewater infrastructure in the receiving environment.

In addition to the construction of new on-site wastewater drainage services, the following alterations to existing water supply services will be performed during the construction phase:

- Extension of the existing Uisce Éireann sewer network by approximately 170m to the development boundary
- Approximately 690m of sewer network upgrades within Mountain Road to facilitate the new development

Potential Direct effects of the construction phase on wastewater drainage services are:

- Blockage or partial reduction in the capacity of existing wastewater drainage services;
- Breakage of existing infrastructure causing network outages and uncontrolled discharges of wastewater;
- Discharges of surface water runoff to existing wastewater drainage services;
- Uncontrolled discharge of wastewater from the construction site welfare facilities to lands and watercourses downstream of the site causing pollution, potential flooding and risk to public health;

In the absence of mitigation measures the **Direct** impact of the construction phase of wastewater drainage services is **Negative** in quality, **Significant** in terms of significance, **Likely** in probability and **Medium-term** in duration.

Potential Indirect, Secondary and Cumulative effects of the construction phase on wastewater drainage services are:

- Overflowing of existing wastewater drainage systems due to reduction in capacity or blockages caused by the works;
- Increased pumping requirements and consequent increased energy demands and servicing requirements at existing wastewater drainage pumping stations due to increased flowrates;
- Reductions in efficiency of existing waste water treatment systems due to increased hydraulic loading and/or introduction of polluted waters;
- Reduction in Biodiversity.

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on wastewater drainage services is **Negative** in quality, **Moderate** in terms of significance, **Unlikely** in probability and **Medium-term** in duration.

Refer to Chapter 11 (Biodiversity) in relation to Indirect, Secondary and Cumulative impact on Biodiversity.

7.8.2.3 Water Supply

New water supply systems will be constructed on site to service the new development, connecting to existing water supply infrastructure at the boundary of the site.

In addition to the construction of new on-site water supply services, the following alterations to existing water supply services will be performed during the construction phase:

- Approximately 600m of watermain upgrades within Mountain Road to facilitate the new development.

Potential Direct effects of the construction phase are:

- Breakages of existing water supply pipework causing large outflows of water and possible local flooding and reduced water supply to premises on the local water supply network;
- Closing of valves on the existing water supply network causing a loss of water supply to premises on the local network.

In the absence of mitigation measures the **Direct** impact of the construction phase on water supply services is **Negative** in quality, **Moderate** in terms of significance, **Likely** in probability and **Medium-term** in duration.

Potential **Indirect, Secondary and Cumulative** effects of the construction phase on water supply services are likely to have no significant effects.

7.8.2.4 Electrical Supply

For Electrical Supply, the permanent electricity connections will not be live during the construction phase until near completion. Construction related activities will require temporary connection to the local electrical supply network. The potential impact from the construction phase of the proposed development on the local electrical supply network is likely to have no significant effects.

7.8.2.5 Telecommunications

No likely significant effects.

7.8.3 Operational Phase

During the operational phase, the site will contain operational surface water drainage, wastewater water drainage, water supply, electrical supply and telecommunications systems to serve the proposed development. Refer to Section 7.3 above for a description of built services for the development.

The potential significant effects associated with the Material Assets - Built Services during the operational phase of this development has been summarised below.

7.8.3.1 Surface Water Drainage

Potential Direct effects on surface water drainage services in operation are as follows:

- Poor general maintenance causing blockage of drainage systems and overflowing with a consequent risk of flooding;
- Poor general maintenance leading to poor performance of pollution control measures in the surface water drainage system and subsequent discharges of surface water containing sediments and pollutants to existing surface water drainage systems and watercourses;
- Poor maintenance of engineered pollution reduction devices in the surface water drainage system leading to discharge of surface water containing sediments and pollutants to existing surface water drainage systems, watercourses and groundwater aquifers.

In the absence of mitigation measures the **Direct** impact of the operational phase on surface water drainage services is **Negative** in quality, **Moderate** in terms of significance, **Likely** in probability and **Permanent** in duration.

Refer to Chapter 9 (Land & Soils) in relation to Indirect, Secondary and Cumulative impact on Land & Soils.

Potential Indirect, Secondary and Cumulative effects on surface water drainage services in operation are as follows:

- Reduction in biodiversity in the wider receiving environment.

Refer to Chapter 11 – Biodiversity – in relation to Indirect, Secondary and Cumulative impact on Biodiversity.

7.8.3.2 Wastewater Drainage

Potential Direct effects on wastewater drainage services in operation are as follows:

- Misconnection of surface water drainage services on site to the wastewater drainage network during the construction phase causing overloading of the wastewater network with surface water and possible resultant reduction in performance of downstream wastewater treatment activities;
- Poor quality control during the construction phase leading to partial or full blockages, overflowing and subsequent pollution of watercourses and hazard to public health.
- Poor quality control during the construction phase leading to excessive infiltration of groundwater into the wastewater drainage system and consequent increased need for conveyance, pumping and treatment of wastewater within the existing Uisce Éireann network

In the absence of mitigation measures the **Direct** impact of the operational phase on wastewater services is **Negative** in quality, **Significant** in terms of significance, **Likely** in probability and **Permanent** in duration.

Refer to Chapter 11 – Biodiversity – in relation to Direct impact on Biodiversity.

Potential Indirect, Secondary and Cumulative effects on wastewater drainage services in operation are as follows:

- Increased need for conveyance, pumping and treatment of wastewater in the existing wastewater drainage network leading to decreased service life of existing infrastructure.

In the absence of mitigation measures the **Indirect, Secondary and Cumulative** impact of the operational phase of wastewater drainage services is **Negative** in quality with a **Slight** significance, **Likely** probability and **Permanent** in duration.

7.8.3.3 Water Supply

Potential Direct effects on water supply services in operation are as follows:

- Poor quality control during the construction phase leading to water leakage from the site network consequent increased demand on the existing water supply network;
- Poor quality control during the construction phase leading to pipe breakages, loss of water from the network and network outages during consequent repair periods.

In the absence of mitigation measures the **Direct** impact of the operational phase on water supply services is **Negative** in quality, **Moderate** in significance, **Likely** probability, **Permanent** in duration.

Potential Indirect, Secondary and Cumulative effects on water supply services in operation are as follows:

- Increased production of water necessitated by excessive pipe leakages requiring greater energy inputs and maintenance requirements of the water treatment system

In the absence of mitigation measures the **Indirect** impact of the operational phase on water supply services is **Negative** in quality, **Slight** in terms of significance, **Likely** in probability and **Permanent** in duration.

7.8.3.4 Electrical Supply

The predicted impact of the operational phase on electrical supply services is Neutral in quality, Imperceptible in significance, Permanent in duration and **Indirect** in type

7.8.3.5 Telecommunications

The predicted impact of the operational phase on telecommunications services is Neutral in quality, Imperceptible in significance, Permanent in duration and **Indirect** in type.

7.8.4 Cumulative Effects

As part of this assessment, other offsite developments and proposed offsite developments as detailed in Chapter 1 of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Development.

These other offsite developments and proposed offsite developments will be of a similar nature to the proposed development. As a result, the cumulative impact is expected to be neutral and not significant.

7.8.5 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 7-1 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Surface Water Drainage	Negative Negative	Significant Significant	Extent 1 Extent 1	Likely Likely	Medium-term Medium-term	Direct Indirect
Wastewater Drainage	Negative Negative	Significant Moderate	Extent 2 Extent 2	Likely Unlikely	Medium-term Medium-term	Direct Indirect
Water Supply	Negative	Moderate	Extent 3	Likely	Medium-term	Direct

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 7-2 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Surface Water Drainage	Negative	Moderate	Extent 1	Likely	Permanent	Direct
Wastewater Drainage	Negative Negative	Significant Slight	Extent 2 Extent 2	Likely Likely	Permanent Permanent	Direct Indirect
Water Supply	Negative Negative	Moderate Slight	Extent 3 Extent 3	Likely Likely	Permanent Permanent	Direct Indirect

With respect to the Extent listed in Table 7- 1 and 7-2 above, the following applies;

Extent 1 – Lands and Premises adjoining the subject site as well as eastward along Mountain Road up to the R611 (Kilmoney Road), including receiving waterbodies to the north and northeast.

Extent 2 - Lands and premises within the Carrigaline areas served by existing wastewater infrastructure downstream of the site

Extent 3 - Lands and premises served by the Inniscarra Water Treatment Plant and lands and premises adjoining the subject site as well as eastward along Mountain Road up to the R611 (Kilmoney Road)

7.9 Mitigation Measures

7.9.1 Incorporated Design Mitigation

All new-build service infrastructure is to be designed in accordance with the relevant service provider and asset owner's code of practice, which require due cognisance of the receiving environment. Design depths of proposed infrastructure are to be optimised so that excessive excavations are avoided where possible, and by association a reduction in resultant waste and machinery operation time.

It is proposed that products and materials are supplied locally, where practicable and available, in order to reduce carbon footprint of travel and production.

7.9.2 Demolition Phase Mitigation

A detailed Construction and Environmental Management Plan (CEMP), in line with the preliminary CEMP submitted as part of this planning application, will be prepared and implemented by the contractor at the construction phase. The mitigation measures described below are relevant to the Demolition Phase and are recommended to be implemented during this phase.

7.9.3 Construction Phase Mitigation

A detailed Construction and Environmental Management Plan (CEMP), in line with the preliminary CEMP submitted as part of this planning application, will be prepared and implemented by the contractor at the construction phase.

7.9.3.1 General Mitigation Measures

The following mitigation measures are recommended for the construction phase of the development:

- Works shall be performed in accordance with Statutory requirements, including Health, Safety and Welfare at Work (Construction) Regulations 2013 (S.I. no. 291 of 2013).
- The works shall be supervised by suitable competent personnel responsible for delivery of the built services as per the permitted development.
- Works in existing roads shall be performed in accordance with Guidelines for Managing Openings in Public Road, Dept of Transport Tourism and Sport, Second Edition (Rev 1), April 2017.
- Works in existing public roads and pedestrian paths shall be performed in accordance with Cork County Council requirements for the management and control of roadworks in Cork County.
- The Construction and Environmental Management Plan (CEMP) prepared to accompany the planning application shall be updated with any and all additional requirements included in a Grant of Permission from the Planning Authority and shall be adopted and executed with updating as necessary to reflect changes in the construction phase.
- The Resource and Waste Management Plan (RWMP) prepared to accompany the planning application shall be updated with all additional requirements included in a Grant of Permission from the Planning Authority and shall be adopted and executed with updating as necessary to reflect changes in the construction phase.
- The locations of all existing on-site services (underground and overhead) shall be confirmed prior to the commencement of works and suitable protection measures put in place to minimise the risk of damage to existing services.
- The precise routing of electricity and telecommunications infrastructure on the site are to be agreed with the relevant service providers prior to the commencement of on-site works.
- Consultation with the relevant services providers shall be undertaken in advance of works. This will ensure all works are carried out to the relevant standards and ensure safe working practices are implemented.
- All reasonable precautions shall be taken to avoid unplanned disruptions to any services / utilities during the proposed works.
- There will be an interface established between the contractor(s) and the relevant utilities service providers / authorities during the construction phase of the proposed development. This interface will be managed in order to ensure a smooth construction schedule with no / minimal disruption to the local community

With the implementation of these mitigation measures, above and below, the severity of the impact of the proposed development on the built services will be minimised, with tie-ins to existing services and installation of new services completed in a satisfactory manner for the relevant service providers.

7.9.3.2 Surface Water Drainage

In addition to the General Mitigation Measures listed above, the following measures shall be implemented in relation to surface water drainage services:

- A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted surface water drainage system free of significant defects.

7.9.3.3 Wastewater Drainage

In addition to the General Mitigation Measures listed above, the following measures shall be implemented in relation to wastewater drainage services:

- Uisce Éireann shall be consulted prior to commencement of works.
- Existing wastewater drainage infrastructure shall be protected in accordance with Uisce Éireann requirements.
- Wastewater drainage services to be adopted by Uisce Éireann shall be constructed in accordance as per the permitted development and in accordance with the following:
 - Code of Practice for Wastewater Infrastructure, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments, Uisce Éireann, July 2020 (Revision 2);
 - Wastewater Infrastructure Standard Details, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments, Uisce Éireann, July 2020 (Revision 2)
 - Quality Assurance (QA) Field Inspection Requirements Manual, Connections and Developer Services (A Guide for Self-Lay Developers), Uisce Éireann, August 2020 (Revision 3)
- In respect of wastewater drainage services not to be adopted by Uisce Éireann, including temporary wastewater drainage, a quality management plan shall be created and implemented to ensure that the works are executed to provide a suitable wastewater drainage system free of significant defects and in accordance with the recommendations of Building Regulations Technical Guidance Document H – Drainage and Waste Water disposal (published 2010, reprinted 2016)

7.9.3.4 Water Supply

In addition to the General Mitigation Measures listed above, the following measures shall be implemented in relation to water supply services:

- Uisce Éireann shall be consulted prior to commencement of works
- Existing water supply infrastructure shall be protected in accordance with Uisce Éireann requirements.
- Water supply services to be adopted by Uisce Éireann shall be constructed in accordance as per the permitted development and in accordance with the following:
 - Code of Practice for Water Infrastructure, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments, Uisce Éireann, July 2020 (Revision 2);
 - Water Infrastructure Standard Details, Connections and Developer Services, Design and Construction Requirements for Self-Lay Developments, Uisce Éireann, July 2020 (Revision 4)
 - Quality Assurance (QA) Field Inspection Requirements Manual, Connections and Developer Services (A Guide for Self-Lay Developers), Uisce Éireann, August 2020 (Revision 3)

- In respect of water supply services not to be adopted by Uisce Éireann, including temporary water supply, a quality management plan shall be created and implemented to ensure that the works are executed to provide a suitable water supply system free of significant defects and in accordance with the recommendations of Building Regulations Technical Guidance Document G – Hygiene (published 2008, Reprinted July 2011)

7.9.3.5 Electrical Supply

The following measures shall be implemented in relation to Electrical Supply services:

- ESB Networks will be consulted prior to commencement of the works
- A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted Electrical Supply System free of significant defects.

7.9.3.6 Telecommunications

The following measures shall be implemented in relation to Telecommunication Supply services:

- Openair will be consulted prior to commencement of the works
- A quality management plan shall be created and implemented to ensure that the works are executed to deliver the permitted Telecommunications Supply System free of significant defects.

7.9.4 Operational Phase Mitigation

The design and construction of the required services infrastructure in accordance with the relevant guidelines and codes of practice is likely to mitigate any potential impacts during the operational phase of the development, with the exception of any routine maintenance of the site services.

Any additional mitigation measures required for the proposed built services, if required, during the operational phase will be as advised by the relevant service provider.

7.9.4.1 Surface Water Drainage

The surface water drainage includes various components to control and ensure the quantity and quality of surface water runoff in accordance with design requirements. Inspection and maintenance of components of the system shall be performed on a regular and scheduled basis to ensure the effective functioning of the system and the mitigation of risk to the receiving environment, for both adoptable and non-adoptable parts of the system.

7.9.4.2 Wastewater Drainage

The wastewater drainage network, when completed, will be vested to Uisce Éireann who will have responsibility for the ongoing maintenance and operation of the services generally.

Wastewater drainage services not to be vested to Uisce Éireann consist of drainage systems within individual premises upstream of each Customer Connection Chamber to each premises. Wastewater drainage systems within individual premises are designed to operate without the need for maintenance. However, this depends on individual good practices. To this end, the following information and educational material will be distributed to purchasers at handover:

- A guide to Managing Your Household Waste & Domestic Water Usage, produced by the Environmental Awareness & Research Unit of Cork County Council.

- Think Before You Flush information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce.
- Think Before You Pour information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce.
- The Dirty Dozen information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce.

The sale or lease of commercial premises that generates grease and oil and food residue as part of its commercial output will include a requirement to install grease traps in accordance with EN 1825- 1:2004 Grease separators Principles of design, performance and testing, marking and quality control and to enter an agreement with a suitably licenced operator to maintain and clean the grease traps on an appropriate maintenance schedule.

7.9.4.3 Water Supply

The water supply network when completed will be vested to Uisce Éireann who will have responsibility for the ongoing maintenance and operation of the service.

Water supply services not to be vested to Uisce Éireann consist of water supply pipework within individual premises downstream of the Customer Connection and Boundary Box to each premises. Water supply systems within individual premises are designed to operate without the need for maintenance. Each purchaser or lease holder will be informed of the location of the shutoff valve at the connection to each premises so that the user may shut off the water supply should the need arise.

7.9.4.4 Electrical Supply

The operational electricity demand of the proposed development has already been calculated and agreed at 12KVa per unit. The connection to the existing network to supply the site will form part of the customer Agreement with ESB Networks. ESB Networks will take charge of their system on completion and will be responsible for the ongoing maintenance and operation of the service.

7.9.4.5 Telecommunications

The operational telecommunications requirement of the proposed development has already been calculated and agreed. The connection to the existing network to supply the site will form part of the customer Agreement with Openair. Openair will take charge of their system on completion and will be responsible for the ongoing maintenance and operation of the service.

7.10 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

Assuming the full and proper implementation of the mitigation measures set out herein; and given that the design, construction and operation of utilities infrastructure are strictly controlled by the respective utility provider and authorities (i.e. Uisce Water, ESB, GNI and so on); the residual impact of the proposed development is as described below.

7.10.1 Demolition Phase

The residual impacts on the Material Assets - Built Services during the demolition phase of this development is insignificant.

7.10.2 Construction Phase

Residual impacts on the built services during the construction phase is considered to be temporary and occasional in nature and not significant, where service is unavoidably disrupted to facilitate the construction phase.

7.10.2.1 Surface Water Drainage

Potential Direct effects of the construction phase on surface water drainage systems are:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the construction phase on surface water drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Potential Indirect, Secondary and Cumulative impacts of the construction phase on surface water drainage systems are:

- No likely significant effects

With the implementation of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on surface water drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Refer to Chapter 11 – Biodiversity – in relation to Direct impact on Biodiversity.

7.10.2.2 Wastewater Drainage

Potential Direct effects of the construction phase on wastewater drainage services are:

- No likely significant effects.

With the implementation of mitigation measures the **Direct** impact of the construction phase of wastewater drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Potential Indirect, Secondary and Cumulative effects of the construction phase on wastewater drainage services are:

- No likely significant effects

With the implementation of mitigation measures the **Indirect, Secondary and Cumulative** impact of the construction phase on wastewater drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Refer to Chapter 11 – Biodiversity – in relation to Indirect, Secondary and Cumulative impact on Biodiversity.

7.10.2.3 Water Supply

Potential Direct effects of the construction phase are:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the construction phase on water supply services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

Potential Indirect, Secondary and Cumulative effects of the construction phase on water supply services are:

- No likely significant effects

7.10.2.4 Electrical Supply

Potential Indirect, Secondary and Cumulative effects of the construction phase on electrical supply services are:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the construction phase on electrical supply services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

7.10.2.5 Telecommunications

Potential Indirect, Secondary and Cumulative effects of the construction phase on electrical supply services are:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the construction phase on telecommunications services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Medium-term** in duration.

7.10.3 Operational Phase

Residual impacts on the built services during the operational phase given the new infrastructure and upgrades to the existing networks is considered to be permanent with a constant occurrence, positive and beneficial to all the end users.

7.10.3.1 Surface Water Drainage

Potential Direct effects on surface water drainage services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on surface water drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Permanent** in duration.

Refer to Chapter 9 – Land & Soils – in relation to Indirect, Secondary and Cumulative impact on Land & Soils.

Potential Indirect, Secondary and Cumulative effects on surface water drainage services in operation are as follows:

- No likely significant effects

Refer to Chapter 11 – Biodiversity – in relation to Indirect, Secondary and Cumulative impact on Biodiversity.

7.10.3.2 Wastewater Drainage

Potential Direct effects on wastewater drainage services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on wastewater services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

Refer to Chapter 11 – Biodiversity – in relation to Direct impact on Biodiversity.

Potential Indirect, Secondary and Cumulative effects on wastewater drainage services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Indirect, Secondary and Cumulative** impact of the operational phase of wastewater drainage services is **Neutral** in quality, **Insignificant** significance, **Likely** probability, **Permanent** in duration.

7.10.3.3 Water Supply

Potential Direct effects on water supply services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on water supply services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

Potential Indirect, Secondary and Cumulative effects on water supply services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Indirect, Secondary and Cumulative** impact of the operational phase on water supply services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

7.10.3.4 Electrical Supply

Potential Direct effects on electrical supply services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on electrical supply services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

7.10.3.5 Telecommunications

Potential Direct effects on telecommunication services in operation are as follows:

- No likely significant effects

With the implementation of mitigation measures the **Direct** impact of the operational phase on telecommunications services is **Neutral** in quality, **Insignificant** in significance, **Likely** probability, **Permanent** in duration.

7.10.4 Summary of Post-mitigation Effects

The following Table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 7-3 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Surface Water Drainage	Neutral Neutral	Insignificant Insignificant	Extent 4 Extent 4	Likely Likely	Medium-term Medium-term	Direct Indirect
Wastewater Drainage	Neutral Neutral	Insignificant Insignificant	Extent 5 Extent 5	Likely Likely	Medium-term Medium-term	Direct Indirect
Water Supply	Neutral	Insignificant	Extent 6	Likely	Medium-term	Direct

The following Table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 7-4 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Surface Water Drainge	Neutral	Insignificant	Extent 4	Likely	Permanent	Direct
Wastewater Drainage	Neutral Neutral	Insignificant Insignificant	Extent 5 Extent 5	Likely Likely	Permanent Permanent	Direct Indirect
Water Supply	Neutral Neutral	Insignificant Insignificant	Extent 6 Extent 6	Likely Likely	Permanent Permanent	Direct Indirect

With respect to the Extent listed in Table 7- 3 and 7-4 above, the following applies;

Extent 4– Lands and Premises adjoining the subject site as well as eastward along Mountain Road up to the R611 (Kilmoney Road), including receiving waterbodies to the north and northeast.

Extent 5 - Lands and premises within the Carrigaline areas served by existing wastewater infrastructure downstream of the site

Extent 6 - Lands and premises served by the Inniscarra Water Treatment Plant and lands and premises adjoining the subject site as well as eastward along Mountain Road up to the R611 (Kilmoney Road

7.10.5 Cumulative Residual Effects

Considering the proposed future developments listed under section 7.8.4 above, the cumulative residual effects are considered to be neutral and not significant.

7.11 Risk of Major Accidents or Disasters

Through the implementation of mitigation measures, there are no identified incidents or examples of major accidents and or natural disasters that present a sufficient combination of risk and consequence that are likely to lead to significant residual impacts or environmental effects or impacts on human health.

7.12 Worst Case Scenario

The European Commission EIAR Guidelines (2017) suggest that different future scenarios including a worstcase scenario should be described. However, systematic risk assessments are only employed only where the "worst case" impacts pose significant threats to the environment and/or human health. It is important to note that this is not applicable in the case of the proposed development and the likelihood of such a scenario occurring in respect of the proposed development is negligible.

7.13 Interactions

Interactions between Material Assets and other environmental topics are outlined throughout this EIAR document. The likely interactions between Material Assets and other environmental factors include interactions between the proposed drainage and wastewater arrangements and Chapter 10: Water and Hydrology of this EIAR.

7.14 Monitoring

All potable water will be cleaned and tested to the satisfaction of Uisce Éireann prior to the connection to the public potable water. In addition, all connections to the public potable water and foul water sewer will be carried out under the supervision of Uisce Éireann.

All new infrastructure, which is to serve the proposed development, is to be routinely inspected with any maintenance carried out, as required. Any monitoring of the built services required during the operational phase of the proposed project will be as advised by the relevant services providers.

7.15 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 7-5 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Surface Water Drainage, Wastewater Drainage, Water Supply	Implement the Construction Environmental Management Plan (CEMP)	Normal monitoring in accordance with the CEMP
Surface Water Drainage, Wastewater Drainage, Water Supply	Implement the Resources and Waste Management Plan (RWMP)	Normal monitoring in accordance with the RWMP
Surface Water Drainage, Wastewater Drainage, Water Supply	Liaise with all relevant Statutory Authorities and Service Providers prior to commencement of construction	No particular requirements
Surface Water Drainage	Create and implement a surface water drainage construction quality control system	Inspection and checking in accordance with the implemented quality control system
Wastewater Drainage, Water Supply	Implement the Uisce Eireann Quality Assurance system for construction of wastewater and water supply services	Inspection and checking in accordance with the requirements of the QA system
Electricity Supply	Implement the ESB Quality Assurance system for construction of electrical services infrastructure	Normal monitoring in accordance with the ESB
Telecommunications	Implement the Openair Quality Assurance system for construction of telecommunication services infrastructure	Normal monitoring in accordance with Openair

The following Table summarises the Operational Phase mitigation and monitoring measures.

Table 7-6 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Surface Water Drainage	Implement a Surface Water Management and Maintenance Plan	Implement the scheduled monitoring as part of the Surface Water Management and Maintenance Plan
Electricity Supply	Implement the ESB Quality Assurance system for construction of electrical services infrastructure	Normal monitoring in accordance with the ESB
Telecommunications	Implement the Openair Quality Assurance system for construction of telecommunication services infrastructure	Normal monitoring in accordance with Openair

7.16 Conclusion

The construction and operation of Built Assets: Services has the potential to result in environmental impacts on surface water drainage systems, wastewater drainage systems, water supply systems, electrical supply systems, telecommunications systems. Mitigation measures as described in this chapter shall be implemented during the construction phase and during the operational phase to minimise the risk of impact on the environment.

7.17 References and Sources

- Greater Dublin Strategic Drainage Study 2005 (GDSDS)
- Uisce Éireann Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03, July 2020, Revision 2)
- Uisce Éireann Code of Practice for Water Infrastructure (IS-CDS-5020-03, July 2020, Revision 2)
- Greater Dublin Regional Code of Practice (V6)
- The Building Regulations 1997, as amended, ('the Building Regulations')
- Department of the Environment's Building Regulations "Technical Guidance Document B - Fire Safety (2020)"
- Technical Guidance Document H – Drainage and Waste Water Disposal (2016)
- Department of the Environment's "Recommendations for Site Development Works for Housing Areas" (1998).
- Department of the Environment's Building Regulations "Technical Guidance Document Part H Drainage and Waste Water Disposal".
- BS EN 752: 2008 "Drain and Sewer Systems Outside Buildings".
- Guidelines on the Information to be Contained In Environmental Impact Assessment Reports (May 2022) published by the EPA Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (Directive 2011/92/EU as amended by 2014/52/EU, 2017) published by the European Commission
- <https://www.esbnetworks.ie/staying-safe/contractor-safety/digging-and-excavation-work>
- <https://www.gasnetworks.ie/corporate/freedom-of-information/make-a-request/>
- <https://cbyd.emaps.eircom.ie/Eircom-CBYD/>

CHAPTER EIGHT

MATERIAL ASSETS: WASTE



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER EIGHT

Table of Contents

Material Assets: Waste

8.1 Introduction 8-1

8.2 Expertise & Qualifications 8-1

8.3 Proposed Development 8-1

8.4 Methodology 8-1

8.5 Difficulties Encountered..... 8-2

8.6 Baseline Environment..... 8-2

8.7 The ‘Do Nothing’ Scenario 8-2

8.8 Potential Significant Effects 8-2

8.9 Mitigation Measures..... 8-5

8.10 Residual Impact Assessment 8-7

8.11 Risk of Major Accidents or Disasters 8-7

8.12 Worst Case Scenario..... 8-7

8.13 Interactions..... 8-7

8.14 Monitoring..... 8-8

8.15 Summary of Mitigation and Monitoring 8-8

8.16 Conclusion 8-8

8.17 References and Sources 8-8

Table of Tables

Table 8-1 Composition of C and D Waste Collected in Ireland in 2020
(Source: EPA, 2022) 8-3

Table 8-2 Composition of C and D Waste Collected in Ireland in 2020
(Source: EPA, 2022) 8-3

Table 8-3 Typical Waste Types and Generated List of Waste (LoW)
Codes 8-4

Table 8-4 Summary of Construction Phase Likely Significant Effects
in the absence of mitigation..... 8-5

Table 8-4 Summary of Operational Phase Likely Significant Effects
in the absence of mitigation..... 8-5

Table 8-3 Summary of Construction Phase Effects Post Mitigation 8-7

Table 8-4 Summary of Operational Phase Effects Post Mitigation..... 8-7

Table 8-5 Summary of Construction Phase Mitigation and
Monitoring 8-8

Table 8-6 Summary of Operational Phase Mitigation and
Monitoring 8-8

CHAPTER EIGHT | Material Assets: Waste

8.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on the environment.

This Chapter has been prepared having regard to the information contained in the Outline Construction Environmental Management Plan, Resource and Waste Management Plan and Operational Waste Management Plan prepared for the proposed development by OSL Butler Consulting Engineers.

8.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Ben Mong CEng MIEI, Senior Civil Engineer at OSL Butler Consulting Engineers.

Ben Mong holds a Bachelor of Engineering Degree and is a Chartered Engineer with Engineers Ireland with 15 years' experience in planning, designing and directing the construction of developments in Ireland and South Africa, including large-scale residential development projects and EIAR's.

Ben Mong has carried out Material Assets: Wastes assessments and been involved in the preparation of EIARs for the following projects:

- Hacketstown Strategic Housing Development, Skerries, County Dublin
- Murphystown Way Large-scale Residential Development, Dublin 18, County Dublin
- Ballygossan Park Large-scale Residential Development, Skerries, County Dublin

8.3 Proposed Development

A full development description can be found in Chapter 2 of this EIAR.

To summarise, the applicant seeks permission for the following Large Scale Residential Development (LRD) comprising the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

8.3.1 Aspects Relevant to this Chapter

The waste management objectives for the proposed development are as follows, and will facilitate material reuse and recycling, where possible, and seek to divert waste from landfill:

- Prevention: The Principal Contractor will prevent and minimise waste generation where possible by ensuring large surpluses of construction materials are not delivered to the site through coordination with the suppliers, operating a 'just-in-time' delivery scheme and ensuring sub-contractors conform to the outline Construction and Environmental Management Plan (oCEMP).

- Reuse: Reusing wastes and surplus materials where feasible and in as many high value uses as possible; ▪ Recycle: Recycling wastes where possible such as introducing on site crushers to produce waste derived aggregates which, subject to appropriate testing and approvals, may be re-used in the Proposed Development; and
- Disposal: Where disposal of waste is unavoidable, this will be undertaken in accordance with the Waste Management Act 1996, as amended.

8.4 Methodology

8.4.1 Relevant Legislation & Guidance

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

- Environmental Protection Agency (2022) Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR);
- EPA (2021) Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects;
- 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 2020, S.I. No. 323 of 2020
- Waste Management Acts 1996 (as amended);
- The National Waste Management Plan for a Circular Economy 2024-2030;
- Cork County Council Bye-laws; and
- Cork County Council Development Plan 2022-2028.

The scope of the work undertaken for the impact assessment included desk-based study of waste management services within the defined 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 design team. Information on waste management in the vicinity of the site of the proposed development will be assembled by reviewing the following information:

- Resource and Waste Management Plan (OSL Butler Consulting Engineers, 2025);
- Outline Construction Environmental Management Plan (OSL Butler Consulting Engineers, 2025);
- Operational Waste Management Plan (OSL Butler Consulting Engineers, 2025); and
- <http://mywaste.ie>

8.4.2 Description and Assessment of Potential Impacts

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 as described in Chapter 1 of this EIAR.

8.4.3 Local and National Waste Action Plans

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); and
- Achieve 70% 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”. In order to achieve the objectives, set out in NWMPCE, it is imperative that robust resource and waste management plans are developed for and designed into the pre-construction, Construction and Operational Phases of the proposed development.

8.4.4 Article 27 of the European Communities (Waste Directive) Regulations 2011

Under Article 27 of the European Communities (Waste Directive) Regulations 2011 (SI No. 126 of 2011) as amended (referred to hereafter as Article 27), uncontaminated soil and stone free from anthropogenic contamination which is excavated during the construction phase of a development can be considered a by-product and not a waste, if (a) further beneficial use of the material is certain, (b) it can be used directly without any further processing, (c) it is produced as an integral part of the development works and (d) the use is lawful and will not have any adverse environmental or human health impacts (EPA, 2019).

For Article 27 to apply, the beneficial use mentioned in point (a) above must be identified for the entirety of the excavated soil from the proposed development prior to its production, with that use taking place within a definite timeframe, for it to be regarded as certain.

8.5 Difficulties Encountered

No difficulties were encountered while compiling this chapter.

8.6 Baseline Environment

8.6.1 Soils

The soils beneath the site have been mapped by the GSI (GSI, 2024) as mineral poorly drained (mainly acidic) Surface Water Gleys / Ground Water Gleys derived from mainly non-calcareous parent materials (IFS Soil Code: AminPD).

The quaternary sediments beneath the site are mapped by the GSI (GSI, 2024) as till derived from Namurian sandstones and shales (TNSSs).

There are no quaternary features mapped by the GSI within the site (GSI, 2024).

The closest quaternary features to the site are mapped by the GSI (GSI, 2024) as undifferentiated meltwater channels which is located approximately 0.32km southwest (orientated in a southwest to northeast direction), 0.33km northwest (orientated in a southwest to northeast direction) and 0.39km southeast (orientated in a southeast to northwest direction).

8.6.2 Bedrock Geology

The bedrock beneath the site is mapped by the GSI (GSI, 2024) as follows:

- The bedrock beneath the northern portion of the site is mapped as the White Strand Formation (New Code: CNWHIT) described as sandstone and interbedded pyritic mudstone.
- The bedrock beneath the central portion of the site is mapped as the Lispatrick Formation (New Code: CDLPTK) described as pyritic cherty mudstone with dolomite.
- The bedrock beneath the southern portion of the site is mapped as the Cuskinny Member (New Code: CDKINS2) described as flaser-bedded sandstone and mudstone.

While there are no bedrock outcrops mapped by the GSI (GSI, 2024) within the site boundary, there are a number of bedrock outcrops mapped within a 2km radius of the site, the closest of which are located approximately 0.36km northwest of the site.

8.6.3 Invasive Species

There are no Third Schedule Invasive Species, which would require additional attention and/or mitigation present on the subject site.

8.7 The ‘Do Nothing’ Scenario

In the ‘Do Nothing’ scenario, the proposed development does not proceed and there would be no excavation, construction or operational waste generated at the site. There would, therefore, be no additional demand or loading on waste management infrastructure locally or nationally and thus there would be a neutral effect on the environment in terms of waste.

8.8 Potential Significant Effects

8.8.1 Demolition and Construction Phase

This is a greenfield site with 3 no. existing farm buildings and associated yards (none of which is habitable and can essentially be described as farm sheds) to be demolished on the northern part of the site.

The Construction Phase will give rise to the requirement to remove and bring quantities of various materials to and from the site. Construction and excavation related wastes will be created during the Construction Phase, and this has the potential to impact on the local waste management network.

An Outline Construction and Environmental Management Plan (OCEMP) (OSLButler Consulting Engineers, 2024) and a Resource and Waste Management Plan (RWMP) (OSLButler Consulting Engineers, 2024) have been prepared for construction phase of the proposed development and will be submitted with the planning application.

There will be bulk excavation cut and fill required throughout the site in order to facilitate the finished levels of the developed site. Cut and fill depths will generally be limited to less than 2m with the exception of certain specific parts of the site where substantially deeper excavation depths will be required.

Existing topsoil and subsoil onsite are uncontaminated and naturally occurring and thus, is in accordance with the regulatory regime for by-products as enshrined in Article 5 of the Waste Framework Directive and as transposed into Irish legislation by Article 27 of the European Communities (Waste Directive) Regulations 2011 and are considered suitable for re-use in the proposed development.

Excavated topsoil and subsoils required for re-use on site will be temporarily stored on site for re-use, otherwise it will be exported. Rock excavated on site will be crushed and re-used on site for filling where suited. Topsoil will be stored in an appropriate manner on site for the duration of the construction works.

Stockpiles have the potential to cause negative impacts on air and water quality. The effects of soil stripping and stockpiling will be mitigated through the implementation of an appropriate earthworks handling protocol during construction. It is anticipated that any stockpiles will be formed within the site boundary of the extraction and there will be no direct link or pathway from this area to any surface water body. It is anticipated that only local/low level of stockpiling will occur as the bulk of the material will be excavated either straight into trucks for transport off-site or will be reused in other areas of the site as fill.

Excavated materials in excess of those required for the site development works will be treated as a by-product (production residue) and exported off-site to be re-used at another suitable site in the first instance in accordance with the Waste Framework Directive (2008/98/EC, as amended by Directive (EU) 2018/851) and as transposed in Ireland by the European Union (Waste Directive) Regulations 2011-2020. These regulations provide for uncontaminated excavated soil and stone and other naturally occurring materials (used on sites other than the one from which they were excavated) to be considered in accordance with the definition of waste and the provisions on by-products and on end-of-waste status. The Directive and Article 27 of those Regulations sets out the requirements and conditions for a material to be regarded as a by-product and not as a waste. The conditions for a material to be regarded as a by-product and not a waste are outlined in Section 8.4.4.

During the demolition and construction phase, excavations and exposed subsoils in open cuts will be blinded and protected with clean broken stone as soon as possible after exposing the subsoil to prevent erosion by surface water runoff.

Waste will also be generated from construction workers e.g., organic/food waste, dry mixed recyclables (wastepaper, newspaper, plastic bottles, packaging, aluminium cans, tins and cartons), mixed non-recyclables and potentially sewage sludge from temporary welfare facilities provided onsite during the Construction Phase. Waste printer/toner cartridges, waste electrical and electronic equipment (WEEE) and waste batteries may also be generated infrequently from site offices.

Table 8-1 shows the composition of C and D waste types produced on construction sites in 2020 based on data from the EPA National Waste Statistics (EPA, 2022. National Waste Statistics Summary Report for 2020).

Table 8-1 Composition of C and D Waste Collected in Ireland in 2020 (Source: EPA, 2022)

Likely Significant Effect	Tonnage	Percent of Total
Soils, stones and dredging spoil	6,946,632	84.4%
Concrete, brick, tile and gypsum	524,605	6.4%
Mixed C and D waste	377,963	4.6%
Metal	199,392	2.4%
Bituminous mixtures	127,681	1.6%
Segregated wood, glass and plastic	52,131	0.6%
Total	8,228,404	100%

An inventory has been presented in the RWMP (OSLButler Engineering Consultants, 2024) and is detailed in Table 8-2. This inventory provides a post-design resource and waste inventory of all residual resources listing the following:

- Description of each residual resource stream predicted;
- The List of Waste (LoW) Code for each stream;
- The predicted quantity of material generated (in tonnes); and
- The identified resource management route options for prevention, reuse, recycling, recovery and disposal for each material.

Table 8-2 Composition of C and D Waste Collected in Ireland in 2020 (Source: EPA, 2022)

LoW Code	Description	Waste Composition	Generated Quantity (Tonnes)	Prevention Non-Waste (Tonnes)	Reuse Rate (%)	Reused Quantity (Tonnes)	Recycling Rate (%)	Recycled Quantity (Tonnes)	Recovery Rate (%)	Recovered Quantity (Tonnes)	Disposal Quantity (Tonnes)
17 01 01 17 01 02 17 01 03	Concrete Brick Tiles and Ceramics	40	1478	-	55	813	40	591	0	-	74
17 02 01 17 02 02 17 02 03	Wood Glass Plastic	4	148	-	0		80	118	18	27	3
17 03 02	Bituminous Material	10	369	-	40	148	60	222	0		0
17 04 01	Copper, Bronze, Brass	0		-							
17 04 02	Aluminium	0		-							

LoW Code	Description	Waste Composition	Generated Quantity (Tonnes)	Prevention Non-Waste (Tonnes)	Reuse Rate (%)	Reused Quantity (Tonnes)	Recycling Rate (%)	Recycled Quantity (Tonnes)	Recovery Rate (%)	Recovered Quantity (Tonnes)	Disposal Quantity (Tonnes)
17 04 03	Lead	0		-							
17 04 04	Zinc	0		-							
17 04 05	Iron and Steel	0		-							
17 04 06	Tin	0		-							
17 04 07	Mixed Metals	15	554	-	0		100	554	0		
17 04 11	Cables	0	-	-							-
17 05 04	Soil and Stone	-	651,174	-		163,637					487,537
17 06 04	Insulation Material	0		-							
17 08 02	Gypsum	0		-							
17 09 04	Mixed C&D	30	1,108	-	30	332	40	443	20	222	111
17 01 06*	Mix of concrete, bricks, tiles etc containing or contaminated with hazardous substances	0		-							
17 02 04*	Glass, plastic and wood containing or contaminated with hazardous substances	0		-							
17 03 01*	Bituminous mixtures containing coal tar	0		-							
17 04 09*	Metal waste contaminated with hazardous substances	0		-							
17 05 03*	Soil and stones containing hazardous substances	0		-							
17 06 05	Construction materials containing asbestos	0		-							

LoW Code	Description	Waste Composition	Generated Quantity (Tonnes)	Prevention Non-Waste (Tonnes)	Reuse Rate (%)	Reused Quantity (Tonnes)	Recycling Rate (%)	Recycled Quantity (Tonnes)	Recovery Rate (%)	Recovered Quantity (Tonnes)	Disposal Quantity (Tonnes)
	Other resources (non-waste materials) – specify as needed										
13 07 01*	Fuel Oils and Diesel	0		-							
20 01 05*	WEEE	0		-							
20 01 08	Biodegradable Canteen Waste	0.25	9	-	0		0		0		9
20 03 01	Mixed Municipal Waste	0.75	28	-	0		0		0		28
	Other wastes (specify as needed)	0		-							
Note - *Denotes waste containing hazardous substances											

The potential impact from the Construction Phase on waste recovery and disposal is likely to be medium-term, negative, direct and slight in nature.

8.8.2 Operational Phase

The Operational Phase of the proposed development will result in an increase in the production of municipal waste in the region and will increase demand on waste collectors and treatment facilities, however, as the surrounding area is urban in nature, waste collection is commonplace. Anticipated wastes arising from the day-to-day operations at the proposed development are summarised in Table 8-3.

Table 8-3 Typical Waste Types and Generated List of Waste (LoW) Codes

Waste Description	List of Waste Codes	Hazard Level	
		Non-Hazardous	Hazardous
Paper and Cardboard	20 01 01	▪	
Glass	20 01 02	▪	
Biodegradable Kitchen Waste	20 01 08	▪	

Waste Description	List of Waste Codes	Hazard Level	
		Non-Hazardous	Hazardous
Textiles	20 01 11	▪	
Solvents	20 01 13		▪
Pesticides	20 01 19		▪
Oils and Fats	20 01 25	▪	
Printer Toner/Cartridges (Hazardous)	20 01 27		▪
Printer Toner/Cartridges (Non-Hazardous)	20 01 28	▪	
Detergents (Hazardous)	20 01 29		▪
Detergents (Non-Hazardous)	20 01 30	▪	
Batteries and accumulators	20 01 33		▪
Waste electrical and electronic equipment (WEEEs)	20 01 34		▪
	20 01 35		
Plastics	21 01 36		▪
	20 01 39	▪	
Metals	20 01 40	▪	
Green Waste	20 02 01	▪	
Mixed Non-Recyclable Waste	20 03 01	▪	
Bulky wastes	20 03 07	▪	

Municipal waste is made up of household waste and commercial waste that is compositionally comparable to household waste. It includes residual, recyclables, organic, bulky, and waste electrical and electronic equipment. An Operational Waste Management Plan (OWMP) has been prepared by OSLButler Engineering Consultants (2024) and is included as a standalone report with this planning application.

The potential impact from the Operational Phase on municipal waste disposal is likely to be **long-term, negative, direct** and **slight** in nature

8.8.3 Cumulative Effects

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 1 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 impact, as a result of potential future developments, have been assessed.

With regard to the other developments under construction and proposed in the vicinity of the site of the proposed development, there will be a greater demand on existing local waste management services and on regional waste acceptance facilities.

The capacity of waste collection companies and waste management facilities in Cork County have been designed with forward planning and expansion in mind to cater for a growing population. It is necessary that all the developments provide the infrastructure and services to assist residents to segregate domestic waste at source, in order to reduce the generation and disposal of non-recyclable mixed waste.

Existing waste collections currently take place in the local area and during the Operational Phase, the proposed development will be added to an existing collection route.

The likely effect will be **neutral** and **not significant** on waste management facilities in the area in the **long term**.

8.8.4 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 8-4 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Generation of construction waste and additional demand on surrounding waste collection facilities	Negative	Slight	Cork County, Carrigaline Area	Likely	Medium-term	Direct

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 8-4 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Generation of operational waste and additional demand on surrounding waste collection facilities	Negative	Slight	Cork County, Carrigaline Area	Likely	Long-term	Direct

8.9 Mitigation Measures

8.9.1 Incorporated Design Mitigation

The following measures have been incorporated into the design:

- Buildings have been designed with material efficiency in mind. This involves reducing the amount of materials used in the building fabric and minimising the waste during construction; and
- Opportunities to achieve on-site and off-site reuse and recycling of waste have been identified.

8.9.2 Demolition and Construction Phase Mitigation

The waste management objective will be to prevent waste arising in the first place, and to re-use, recycle or recover waste materials where possible. The following mitigation measures are recommended for the Construction Phase of the proposed development regarding waste management:

- Dedicated, secure waste segregation areas have been selected for the duration of the enabling works. The dedicated waste storage areas within the waste segregation points will house all bins and skips for the storage of segregated construction waste generated. All containers will be marked with clear signage which will identify which waste types are to be placed into each container.
- Waste materials will be separated at source and will follow the Resource and Waste Management Plan (RWMP) and Outline Construction and Environmental Management Plan (OCEMP);
- Prior to the commencement of the Construction Phase detailed calculations of the quantities of topsoil, subsoil and green waste will be prepared, and soils will be tested to confirm they are clean, inert or non-hazardous;
- A policy of 'as needed' ordering and strict purchasing procedures will be implemented to prevent waste arisings as far as possible;
- The Contractor will vet the source of aggregate, fill material and topsoil imported to the site in order to ensure that it is of a reputable origin and that it is "clean" (i.e., it will not contaminate the environment).
- The Contractor and/or Council will implement procurement procedures to ensure that aggregate, fill material and topsoil are acquired from reputable sources with suitable environmental management systems as well as regulatory and legal compliance;
- The waste materials generated during the Construction Phase will be stored in suitably size receptacles and transferred offsite for appropriate processing, recycling and recovery;
- Waste materials generated from the Construction Phase that are unsuitable for reuse or recovery will be separately collected;
- Disposal of construction generated wastes will be considered a last resort and only after recycling or recovery options have been ruled out;
- A suitably competent and fully permitted waste management company will be employed to manage waste arising for the Construction Phase. The appointed waste contractor must have the relevant authorisations for the collection and transport of waste materials, issued by the National Waste Collection Permit Office (NWCPO);
- All waste materials will be transported to an appropriately authorised facility, which must have the relevant authorisations for the acceptance and treatment of the specific waste streams, i.e., a Certificate of Registration (COR) or a Waste Facility Permit (WFP) as granted by a Local Authority, or a Waste/Industrial Emission Licence as granted by the Environmental Protection Agency;
- It is not envisaged that there will be any hazardous waste generated throughout the construction works however, in the event that hazardous soil, or historically deposited waste is encountered during the site bulk excavation phase, the contractor will notify Cork City Council and provide a Hazardous / Contaminated Soil Management Plan, to include estimated tonnages, description of location, any relevant mitigation, destination for disposal/treatment, in addition to information on the authorised waste collector(s). Only authorised facilities will be used and as a result of this, the potential impacts at any authorised receiving facility sites will have been adequately assessed and mitigated as part of the statutory consent procedures;
- Waste generated by construction workers will be stored in wheelie bins on site and it will be collected by an appropriately authorised waste collector.
- All wastes generated on site will be sent for recycling, recovery, or disposal to a suitably licensed or permitted waste facility; and

- All waste quantities and types will be recorded and quantified, and records will be retained onsite for the duration of the Construction Phase.

These mitigation measures will ensure that the waste arising from the Construction Phase of the proposed development is dealt with in compliance with provisions of the Waste Management Act 1996, as amended, associated Regulations and Litter Pollution Act 1997, and The National Waste Management Plan for a Circular Economy 2024-2030. The mitigation measures will also ensure optimum levels of waste reduction, reuse, recycling and recover are achieved and will promote more sustainable consumption of resources.

The Contractor will have the responsibility to record resource and waste management at the site in line with the Construction Waste Management Plan (CWMP). Some of the principal duties and responsibilities of this role include:

- Report to Project Manager on the management of resources and waste at the site; ▪ Identify all destinations for resources taken off-site;
- Address end-of-waste and by-product notifications with the EPA, where applicable;
- Maintain full records of all resources (both wastes and other resources) for the duration of the project; ▪ Delegate responsibility to sub-contractors, where necessary;
- Coordinate with suppliers, service providers and sub-contractors; and
- Prioritise waste prevention and resource salvage.

In terms of invasive species, as noted above, there are no Third Schedule Invasive Species, which would require additional attention and/or mitigation present on the subject site.

8.9.3 Operational Phase Mitigation

As previously stated, an Operational Waste Management Plan has been prepared by OSLButler Engineering Consultants (2024) for the proposed development. The OWMP details the waste segregation and storage capacity requirements, as well as the plan which will be adopted to manage the residential and commercial waste arising from the proposed development, one operational. The OWMP has reviewed policy alongside best practice guidance and recommendations for sustainable waste and recycling management arrangements for the proposed development and ensures a high level of recycling, reuse and recovery at the development and also ensures that waste management is carried out in accordance with the requirements of the Cork County Council Development Plan 2022 – 2028, Cork County Council Bye-laws and Ireland's National Waste Policy.

Implementation of the OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus contributing to the targets set out in the National Waste Management Plan for a Circular Economy (NWMPE) 2024 -2030.

The waste storage and collection strategy outlined in the OWMP will provide adequate storage capacity for the estimated quantity of segregated waste. Designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details outlined in the OWMP.

The layout of the proposed development facilitates access for refuse vehicle collection of waste throughout the site.

The OWMP will also include mitigation measures to ensure a high level of recycling, reuse and recovery at the proposed development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in The National Waste Management Plan for a Circular Economy 2024-2030.

8.10 Residual Impact Assessment

This section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

8.10.1 Demolition and Construction Phase

The residual effects on waste management are considered slight, neutral, direct and medium-term, this is due to:

- The prevention and mitigation measures proposed within this and other chapters of the EIAR;
- Compliance with national legislation and the allocation of adequate time and resources dedicated to efficient waste management practices; and
- Continued use of permitted/licensed waste hauliers and facilities. Waste removed from the facility will be managed appropriately and will avoid environmental impacts or pollution. In addition, the correct management and storage of waste will avoid litter or pollution issues at the site.

8.10.2 Operational Phase

Waste materials will be generated on an ongoing basis during the Operational Phase; these will for the most part consist of municipal waste and recyclable materials. Careful management of these, including segregation at source, will help to ensure a high level of waste recycling, reuse, and recovery at the development.

Given the provision of appropriate facilities, and their correct use by residents, environmental impacts (e.g. litter, contamination of soil or water, etc.) arising from operational waste storage and removal are expected to be minimal. The use of suitably licensed waste contractors will ensure compliance with relevant legal requirements and appropriate off-site management of waste. With the implementation of the proposed operational waste management measures, the proposed development is not expected to have a significant environmental impact with respect to operational waste. The likely effect of the Operational Phase on waste management will be neutral, direct and slight in the long-term

8.10.3 Summary of Post-mitigation Effects

The following Table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 8-3 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Generation of construction waste and additional demand surrounding waste collection facilities	Neutral	Slight	Cork County, Carrigaline Area	Likely	Medium-term	Direct

The following Table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 8-4 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Generation of construction waste and additional demand surrounding waste collection facilities	Neutral	Slight	Cork County, Carrigaline Area	Likely	Medium-term	Direct

8.10.4 Cumulative Residual Effects

The capacity of waste collection companies and waste management facilities in Cork County have been designed with forward planning and expansion in mind to cater for a growing population. It is necessary that all the developments provide the infrastructure and services to assist residents to segregate domestic waste at source, in order to reduce the generation and disposal of non-recyclable mixed waste.

Existing waste collections currently take place in the local area and during the Operational Phase, the proposed development will be added to an existing collection route. The likely effect will be **neutral** and **not significant** on waste management facilities in the area in the **long term**.

8.11 Risk of Major Accidents or Disasters

Not relevant to waste management.

8.12 Worst Case Scenario

A worst-case scenario would be where a previously unclassified hazardous waste stream arose on the site during excavations, which was not identified and segregated appropriately and resulted in the contamination of a non-hazardous waste stream, such as soil and stones, resulting in a large volume of hazardous waste that would require specialist removal and treatment. Additionally, the contaminated soil and stones would no longer be fit for use for fill and landscaping and would need to be replaced with imported materials

8.13 Interactions

8.13.1 Population and Human Health

The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers. Potential impacts on population and human health are addressed in Chapter 4 of this EIAR.

8.13.2 Biodiversity

The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 11 of this EIAR (Biodiversity).

8.13.3 Land & Soils

Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated from the Site. Potential impacts on land and soils are addressed in Chapter 9.

8.13.4 Material Assets: Traffic & Transport

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 affect the surrounding road network. Potential impacts on traffic are addressed in Chapter 6 of this EIAR.

8.14 Monitoring

8.14.1 Demolition and Construction Phase

The site control measures to manage and minimise waste include:

- Signage on the site office/welfare bins to separate them as environmental/domestic waste bins; and
- Briefing for all sub-contractors via induction handouts.

The Resource Manager (RM) will be responsible for conducting ongoing resource audits at the site during the Construction Phase. The audit protocol will be risk based and focus on key issues of concern but will include as minimum:

- Adequacy of site signage and need for any repairs or upgrades;
 - Adequacy of storage infrastructure and need for any repairs or upgrades;
 - Compliance with resource segregation protocols and observed contamination in any resource streams;
 - Assessment of observed Contractor and Sub-Contractor work practices for compliance with the CWMP;
- The RM will undertake a review of all records of wastes and resources generated on-site and transported off-site periodically through the Construction Phase. If waste movements are not accounted for, the reasons for this are to be established to understand why the record keeping system has not been maintained and implement corrective actions if needed;
- The resource records will be compared with established targets for the site (e.g., reuse of resource target or recycling waste target);
- Examining material management on-site to determine where the largest percentage of residual waste generation is occurring. The waste management methods for each material type will be reviewed in order to highlight how project contract targets can be achieved; and
- Issue corrective actions (training, penalties, etc.) as required to site operatives where deviations of the CWMP are observed.

8.14.2 Operational Phase

The building management company and future residents will be required to maintain the bins and storage areas in good condition as required by the Cork County Council Waste Bye-Laws. The waste strategy presented in the OWMP will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details of this strategy.

8.15 Summary of Mitigation and Monitoring

The following Table summarises the Construction Phase mitigation and monitoring measures.

Table 8-5 Summary of Construction Phase Mitigation and Monitoring

Likely Significant Effect	Mitigation	Monitoring
Generation of construction waste and additional demand on surrounding waste collection facilities	CEMP, CWMP, Authorised waste contractor and National Waste Collection Permit	Resource Manager to be appointed.
Invasive Species	An invasive species specialist will be contracted to treat and eradicate and prepare a project specific Invasive Alien Plant Species (IAPS) standard operating procedure document.	IAPS Specialist / Contractor to maintain records

The following Table summarises the Operational Phase mitigation and monitoring measures.

Table 8-6 Summary of Operational Phase Mitigation and Monitoring

Likely Significant Effect	Quality	Significance
Generation of operational waste and additional demand on surrounding waste collection facilities	OWMP	Maintenance of bins and storage areas in good condition as required by the Cork County Council Waste Bye-Laws

8.16 Conclusion

The implementation of the mitigation measures outlined in Section 8.9 will ensure that high rates of reuse, recovery and recycling are achieved at the site during the Construction and Operational Phases. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for management of waste are achieved.

The residual effects on waste management are considered to be considered slight, neutral, direct and medium-term for the Construction Phase and neutral, direct and slight in the long-term for the Operational Phase.

8.17 References and Sources

- Department of Communications, Climate Action and Environment (DCCAE) (2021) A Waste Action Plan for a Circular Economy – Ireland’s National Waste Policy 2020-2025
- Cork County Council Development Plan 2022-2028.
- Cork County Council, County Cork Waste Management Bye-laws, 2019.
- Environmental Protection Agency, 2022, Guidelines on the Information to Be Contained in Environmental Impact Assessment Reports.
- Environmental Protection Agency, 2021, Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects

- Environmental Protection Agency, 2019, Guidance on Soil and Stone By-products in the context of article 27 of the European Communities (Waste Directive) Regulations 2011, Version 3.
- Environmental Protection Agency, 2003, Advice Notes on Current Practice in the preparation of Environmental Impact Statements.
- Environmental Protection Agency, 2002, Guidelines on the information to be contained in Environmental Impact Statements.
- Litter Pollution Act 1997.
- Local Government Ireland (2024) The National Waste Management Plan for a Circular Economy 2024-2030.
- Operational Waste Management Plan, OSL Butler Consulting Engineers, 2024.
- Outline Construction Environmental Management Plan, OSL Butler Consulting Engineers, 2024.
- Resource and Waste Management Plan, OSL Butler Consulting Engineers, 2024.
- 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 1996-2011 (as amended).

CHAPTER NINE

LAND & SOILS



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER NINE

Table of Contents

Land & Soils

9.1 Introduction 9-1

9.2 Expertise & Qualifications 9-1

9.3 Proposed Development 9-1

9.4 Methodology 9-2

9.5 Difficulties Encountered..... 9-3

9.6 Baseline Environment..... 9-4

9.7 The ‘Do Nothing’ Scenario 9-8

9.8 Potential Significant Effects 9-8

9.9 Mitigation Measures..... 9-10

9.10 Residual Impact Assessment 9-12

9.11 Risk of Major Accidents or Disasters 9-14

9.12 Worst Case Scenario 9-14

9.13 Interactions..... 9-14

9.14 Monitoring 9-15

9.15 Conclusion 9-15

9.16 References and Sources 9-15

Table of Tables

Table 9-1. Criteria for Rating Site Importance of Geological Features...9-3

Table 9-2. Assessment of Potential Terminology and Methodology 9-3

Table 9-3. Historical Land Use 9-5

Table 9-4. Geochemically Appropriate Levels for Domain 1 9-7

Table 9-5 Summary of Demolition and Construction Phase Likely
Significant Effects in the Absence of Mitigation.....9-9

Table 9-6 Summary of Operational Phase Likely Significant Effects
in the Absence of Mitigation 9-10

Table 9-7. Residual Impacts (Demolition and Construction Phase) 9-13

Table 9-8. Residual Impacts (Operational Phase).....9-14

Table 9-9 Summary of Demolition and Construction Phase Effects
Post Mitigation 9-14

Table 9-10 Summary of Operational Phase Effects Post Mitigation.....9-14

Table of Figures

Figure 9-1. Site Location 9-4

Figure 9-2. Existing Site Layout..... 9-5

Figure 9-3. Teagasc Soils..... 9-6

Figure 9-4. Quaternary Geology..... 9-6

Figure 9-5. Bedrock Geology 9-7

CHAPTER NINE | Land & Soils

9.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the Proposed Development on the receiving 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.
- Evaluate the significance of any residual impacts.

This chapter of the EIAR should be read in conjunction with Chapter 4 Population and Human Health, Chapter 10 Hydrology and Hydrogeology, Chapter 13 Air Quality, Chapter 5 Landscape and Visual Impact, Chapter 6 Material Assets: Traffic and Transport, Chapter 8 Material Assets: Waste and Chapter 11 Biodiversity of the EIAR and other information provided by the Applicant pertaining to the design proposals for the Proposed Development.

9.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Gareth Carroll, a Principal Consultant of Enviroguide Consulting.

Gareth Carroll holds a BA in Mathematics and a BEng in Civil, Structural and Environmental Engineering from Trinity College Dublin. Gareth Carroll, a Chartered Environmentalist with the Institute of Environmental Sciences (CEnv) and over 11 years’ experience as an Environmental Consultant, has carried out environmental assessments for a range of project types and geological and hydrogeological site settings and been involved in the preparation of EIARs for the following projects:

- Large-Scale Residential Development at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18.
- Large-Scale Residential Development at White Car Park Site (Site A) at Blanchardstown Town Centre, Coolmine, Dublin 15.
- Large-Scale Residential Development at lands located at Haggardstown, Dundalk, Co. Louth.

9.3 Proposed Development

The Proposed Development will include the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

The full description of the Proposed Development is outlined in Chapter 2 of this EIAR.

9.3.1 Aspects Relevant to this Chapter

The Proposed Development will include the following components which are of particular relevance with respect to land, soils and geology.

9.3.1.1 Demolition and Construction Phase

The demolition and construction Phase of the Proposed Development will include:

- The demolition and removal of existing agricultural/farm sheds to the north east of the site.
- Building foundations will consist of traditional shallow strip foundations and ground bearing floor slabs.
- Excavation of soil and subsoil for the construction of building foundations, drainage and other infrastructure to depths of between 1.0 meters below ground level (mbGL) and 3.0mbGL with the excavation of approximately 13,800m³ of soil and subsoil. It is noted that excavation depths will generally be limited to less than 2m with the exception of certain specific parts of the site where deeper excavation depths will be required.
- It is anticipated that there will be no requirement for the excavation of bedrock during the construction phase of the Proposed Development.
- It is intended to reuse suitable excavated soil and subsoil for landscaping and engineering use. However, where required, the removal of unsuitable soil and subsoil offsite will be undertaken in accordance with all statutory legislation.
- The importation of approximately 16,450m³ of inert soil and subsoil will be required to achieve formation levels.
- The importation of approximately 8,500m³ of aggregate fill materials will be required for the construction of the proposed development (e.g., granular material beneath road pavement, under floor slabs and for drainage and utility bedding / surrounds etc.).
- Temporary stockpiling of excavated material pending re-use onsite.

9.3.1.2 Operational Phase

The operational phase of the Proposed Development consists of the typical activities in a residential development and with the exception of localised gardening works undertaken by the appointed management company, there will be no bulk excavation of soils or bedrock or infilling of waste.

The land use at the site will change from generally undeveloped greenfield land to residential land with associated vehicular and pedestrian access, car parking and landscaping.

There will be no requirement for bulk storage of petroleum hydrocarbon-based fuels during the Operational Phase of the Proposed Development as the main operating system for heating will be an air source heat pump. Further details are provided in Chapter 7 Material Assets: Built Services of this EIAR.

9.4 Methodology

9.4.1 Relevant Legislation & Guidance

The methodology adopted for this assessment takes cognisance of the 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.
- 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.

9.4.2 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 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. This element of the assessment also included developing of the Conceptual Site Model (CSM) for the site and the 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.

A site walkover survey to establish the environmental site setting and baseline conditions at the Proposed Development site relevant to the land, soil and geology environment was undertaken by Enviroguide on the 4th of June 2024.

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

- Environmental Protection Agency (EPA) webmapping 2025 (EPA, 2025).
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater webmapping, 2025 (GSI, 2025).

- Google Earth Mapping and Imagery, 2025 (Google Earth, 2025).
- Ordnance Survey Ireland (OSI) webmapping, 2025 (OSI, 2025).
- National Parks and Wildlife Services (NPWS) webmapping, 2025 (NPWS, 2025).
- Teagasc webmapping, 2024 (Teagasc, 2025).
- Information provided by the Applicant pertaining to the design proposals for the Proposed Development;
 - Site investigation works, which included the excavation of trial pits to depths ranging from 2.9mbGL to 3.6mbGL, were undertaken by Priority Geotechnical Ltd. (PGL) in 2018. The results of the site investigation were used to identify and assess the existing ground conditions and geological environment at the site. A review and summary of the site investigation data was undertaken by PGL in 2024 (PGL, 2024) and is included in Volume 3 Appendix 9.1 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.

9.4.3 Consultation

A Section 32B of the Planning and Development Act 2000 (as amended) meeting was held with Cork City Council. The relevant findings of the Large-Scale Residential Development (LRD) Opinion Report (Cork City Council, 2024) in respect to land, soil and geology have been considered in this chapter of the EIAR.

The GSI was consulted on the 18th of June 2024 regarding the Proposed Development. A response was received on the 3rd of July 2024 (GSI Ref. 24/234). The relevant findings of the consultation in respect to land, soil and geology have been taken into consideration and assessed in this chapter of the EIAR.

9.4.4 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 9-1.

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 of the EIAR is described in Table 9-1.

Table 9-1. 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 onsite 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 onsite 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.
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.

9.4.5 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 9-2 as per the EPA (2022) - *Guidelines on the information to be contained in Environmental Impact Assessment Reports*.

Table 9-2. Assessment of Potential Terminology and Methodology

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
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

9.5 Difficulties Encountered

There were no difficulties were encountered in the preparation of this Chapter of the EIAR.

9.6 Baseline Environment

9.6.1 Site Location and Surrounding Land Use

The site of the Proposed Development is located at Mountain Road, Kilmoney, Co. Cork. The site is within the southwest settlement boundary of Carrigaline.

The site is accessed via Mountain Road which adjoins the northern boundary of the site. It is noted that as part of the Proposed Development, it is proposed to upgrade Mountain Road to a 5.5m wide carriageway with a 3m shared pedestrian and cycle path to the north of the carriageway to join the previously approved Part 8 junction upgrade at the R611 regional road.

The area surrounding the site is characterised by a mix of land uses, primarily residential and agricultural.

The site is bound to the north by Mountain Road, along which there are a number of individual one-off dwelling houses on both sides of the carriageway, to the south and west by greenfield, agricultural lands, and to the east by the existing Wheatfields residential estate.

The location of the site is presented in Figure 9-1.

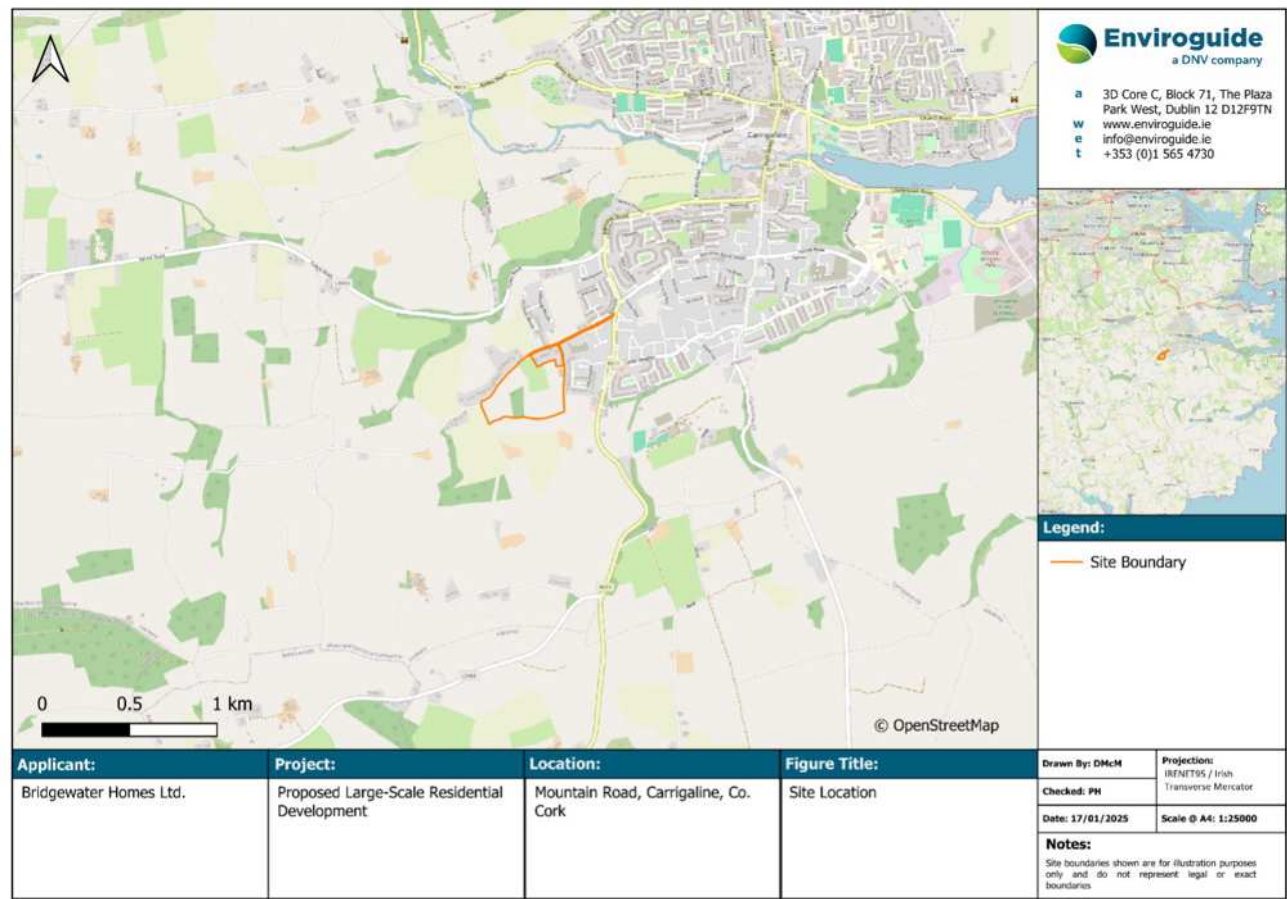


Figure 9-1. Site Location

9.6.2 Current and Historical Land Use

The site of the Proposed Development comprises 12.97hectares (Ha) of undeveloped agricultural lands divided into small fields by existing hedgerows with a small area of woodland comprising mainly willow scrub located within the centre of the site. There are some existing agricultural/farm sheds located in the northeast of the site.

The existing site layout is presented in Figure 9-2.

The following land zoning and zoning objective, set out in the Cork County Development Plan 2022-2028 is applicable to the site of the Proposed Development:

- ‘Residential (RE)’ which ‘are intended primarily for housing development but may also include a range of other uses, particularly those that have the potential to foster the development of new residential communities.

In accordance with the Cork County Development Plan 2022-2028, the site of the Proposed Development is primarily zoned CL-R-10 with the following zoning objective:

- “Medium B density residential development to include a mix of house types accompanied with appropriate landscaping. Access to the site will be from the R611 and the Mountain Road. Specific arrangements will be made for the provision and construction of the link road (CL-U-07) the southern relief road, amenity walk (CLU-08)”

Parts of the site boundary are zoned as ‘ER -Existing Residential/Mixed Residential and Other Uses’. In accordance with the Cork County Development Plan 2022-2028, the objective for this zoning is:

- “to conserve and enhance the quality and character of established residential communities and protect their amenities.”

This residential-led development is consistent with the CL-R-10 zoning objective for the site lands. The proposed uses comprising residential, creche, community room and café are all permissible uses under this zoning objective.

Works are also proposed along Mountain Road in order to provide vehicular and pedestrian access to the Proposed Development. These works are appropriate in the context of the ‘ER - Existing Residential/Mixed Residential and Other Uses’, with works along Mountain Road enhancing road and pedestrian infrastructure both for the development site and for existing residential estates/dwellings along Mountain Road.

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2025) and Google Earth (Google Earth, 2025) were reviewed and key observations onsite and offsite are summarised in Table 9-3.

Table 9-3. Historical Land Use

Date	Information Source	Site Description
1837-1842	OSI Map 6 inch	On-site: The Proposed Development site is shown as open fields which are divided by field boundaries. The site is bound to the north, east and west by local roadways. The site is bound to the south by open fields. Off-site: The surrounding lands comprise open fields with a number of one-off buildings (likely residential/agricultural use). A stream (i.e., the Healy's Bridge Stream) is mapped approximately 0.25km west of the site. A river (i.e., the West Carrigaline River) is mapped approximately 0.29km north of the site. The town of Carrigaline is mapped to the northeast of the site.
1888-1913	OSI 25 Inch	On-site: No significant changes. Off-site: An area of standing water is noted in the field adjoining the southern boundary of the site. Two quarries, which are mapped as "disused" are shown approximately 0.44km and 0.55km north of Proposed Development site.
1830-1930	OSI Cassini map 6inch	On-site: No significant changes. Off-site: No significant changes.
1995	OSI Aerial Photograph	On-site: No significant changes. The site is shown as undeveloped open fields divided by field boundaries. A small area of woodland is shown within the centre of the site. Off-site: A farmyard is identified within the field adjoining the eastern boundary of the site. There are a number of individual one-off dwelling houses on both sides of the roadway adjoining the northern boundary of the site (i.e., Mountain Road). The town of Carrigaline has expanded toward the site.
1996-2000	OSI Aerial Photograph	On-site: No significant changes. Off-site: No significant changes.
2001-2005	OSI Aerial Photograph	On-site: No significant changes. Off-site: Ground disturbance works can be identified within the lands beyond the farmyard adjoining the eastern boundary of the site. The town of Carrigaline has further expanded.
2013-2018	OSI Aerial Photograph	Onsite: No significant changes Off-site: The existing Wheatfields residential estate is identified within the lands beyond the farmyard adjoining the eastern boundary of the site.
2025	Google Earth	On Site: No significant changes. Off Site: No significant changes.

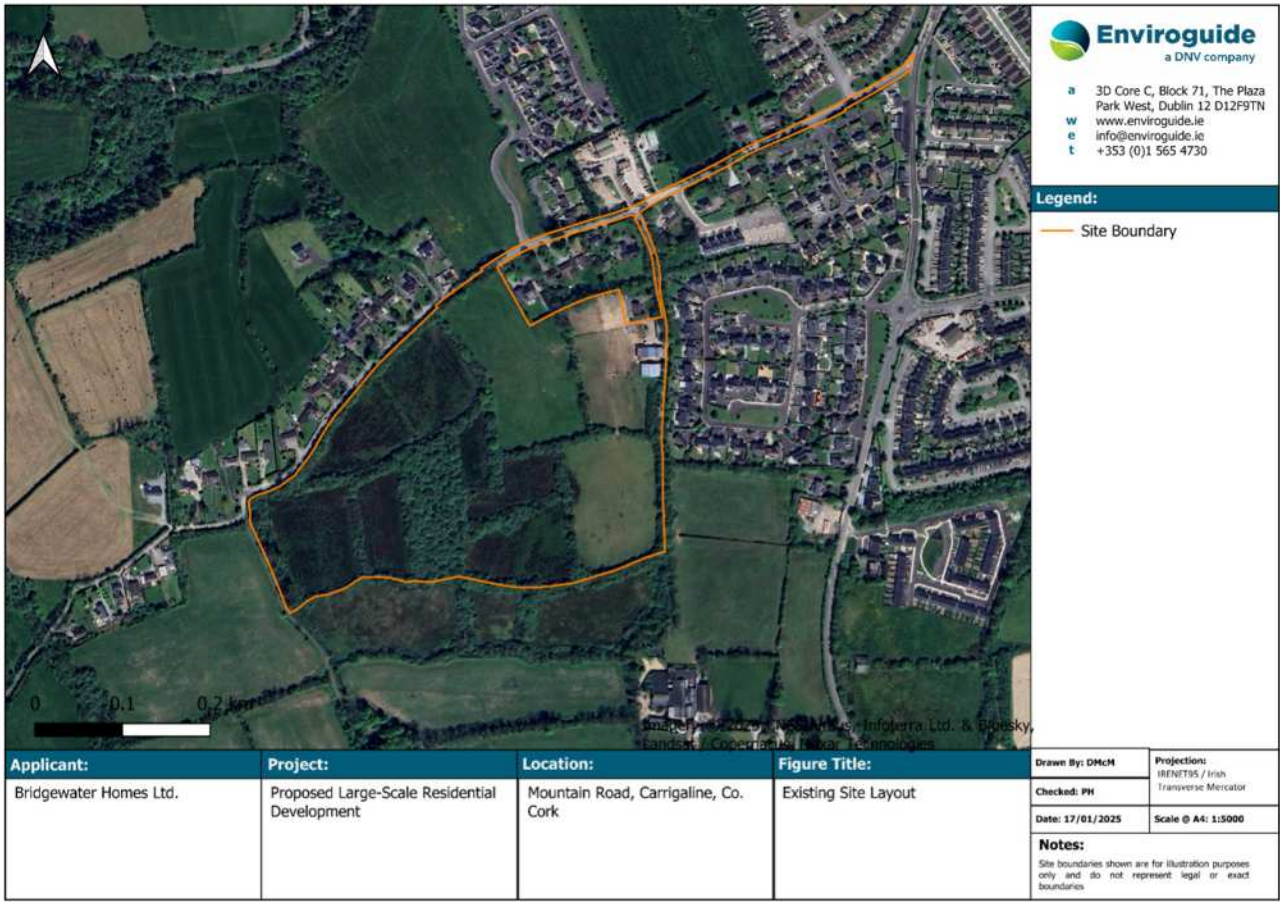


Figure 9-2. Existing Site Layout

9.6.3 Topography

As documented in the Site-Specific Flood Risk Assessment submitted with the planning application (OSL Butler Consulting Engineers (OSL), 2025a), the site slopes from the south western corner of the site towards the north eastern corner. The site has a high point in the south western corner of the site 62.5 meters above Ordnance Datum (mOD) to a low point on the north eastern corner of the site of 52.75mOD.

9.6.4 Soils

The soils beneath the site have been mapped by the GSI (GSI, 2025) as mineral poorly drained (mainly acidic) Surface Water Gleys / Ground Water Gleys derived from mainly non-calcareous parent materials (IFS Soil Code: AminPD).

The GSI (GSI, 2025) mapped soils at the site are presented in Figure 9-3.

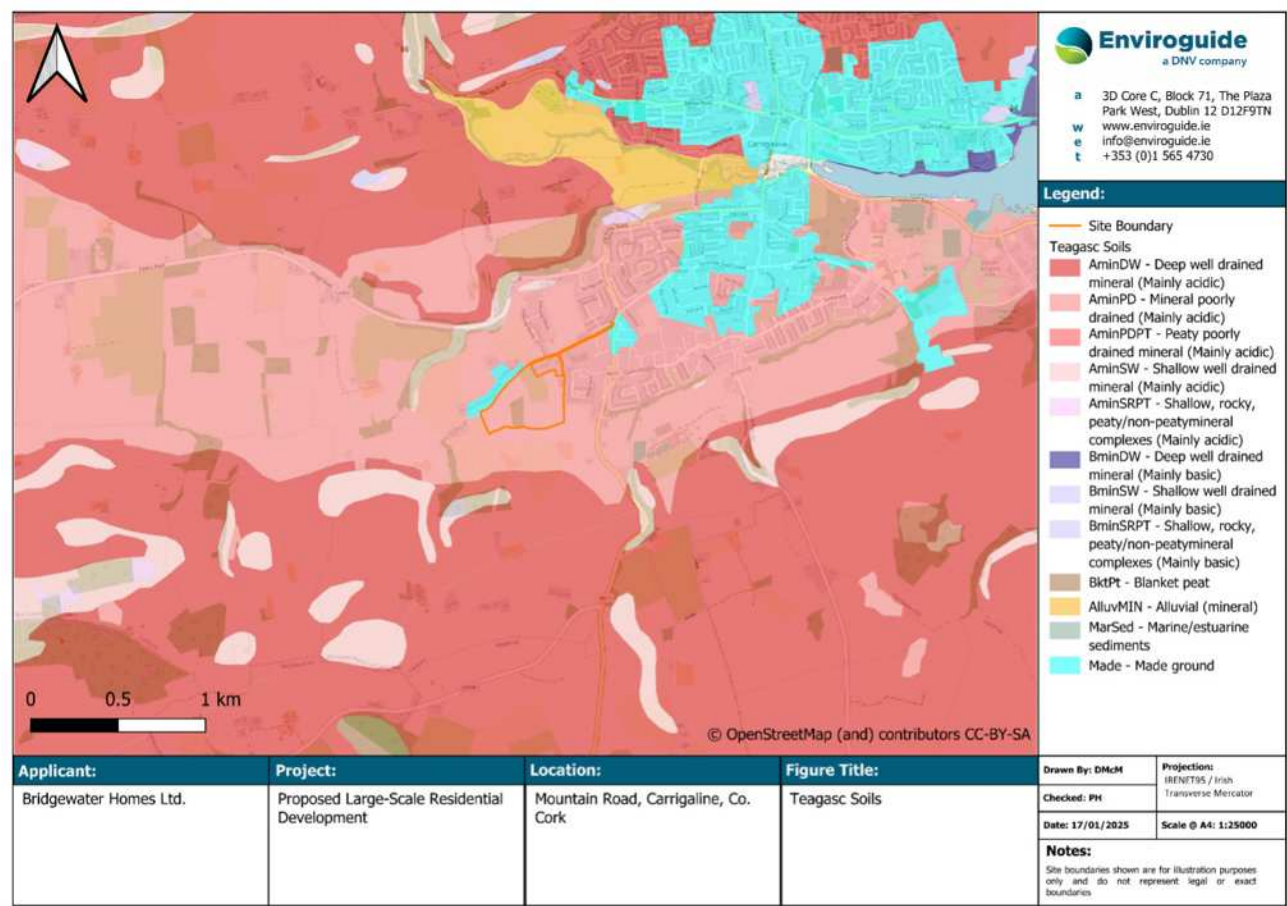


Figure 9-3. Teagasc Soils

9.6.5 Quaternary Geology

The quaternary sediments beneath the site are mapped by the GSI (GSI, 2025) as till derived from Namurian sandstones and shales (TNSSs).

The GSI (GSI, 2025) mapped quaternary geology at the site is presented in Figure 9-3.

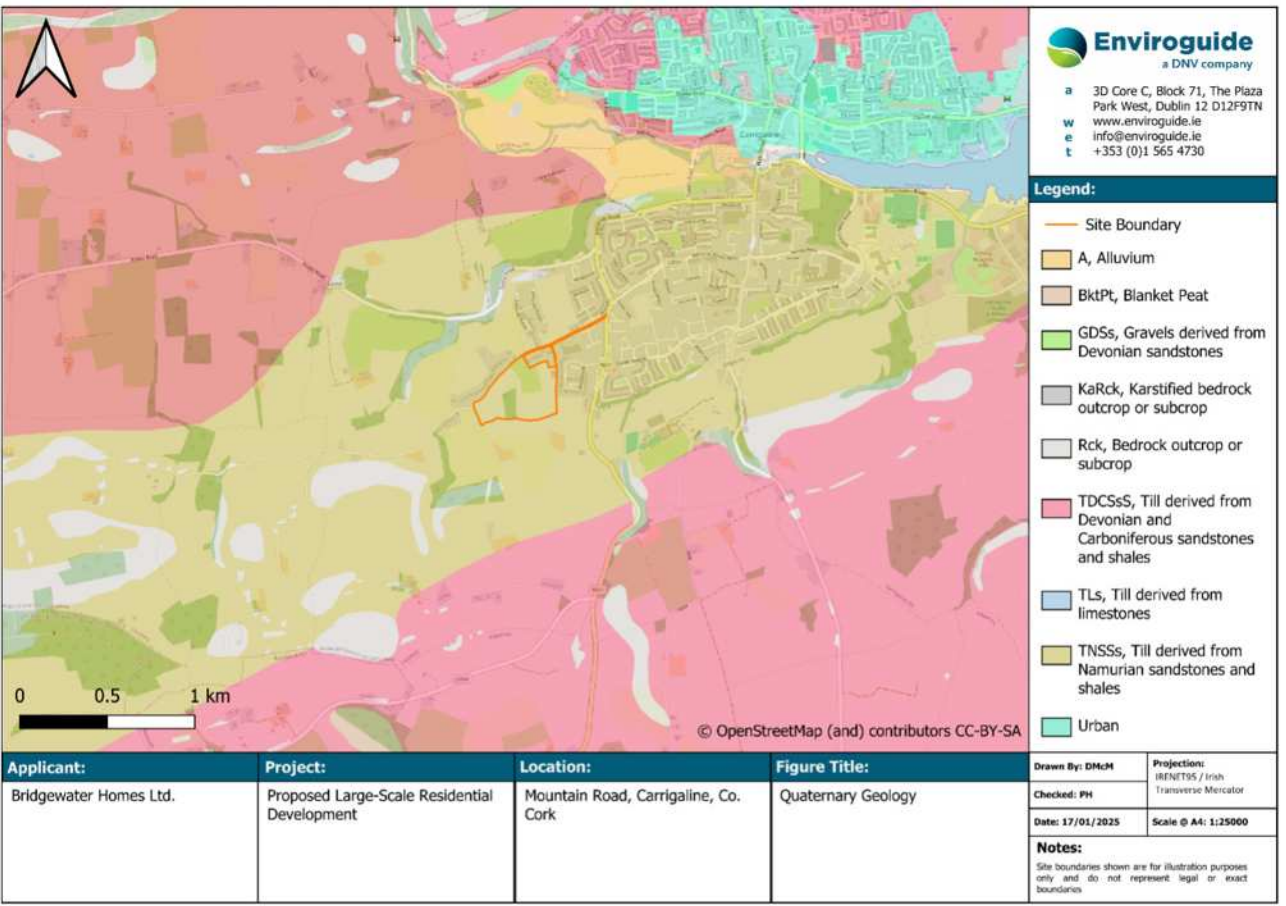


Figure 9-4. Quaternary Geology

9.6.6 Quaternary Geomorphology

There are no quaternary features mapped by the GSI within the site (GSI, 2025).

The closest quaternary features to the site are mapped by the GSI (GSI, 2025) as undifferentiated meltwater channels which are located approximately 0.32km southwest (orientated in a southwest to northeast direction), 0.33km northwest (orientated in a southwest to northeast direction) and 0.39km southeast (orientated in a southeast to northwest direction).

9.6.7 Bedrock Geology

The bedrock beneath the site is mapped by the GSI (GSI, 2025) within three major lithological units as follows:

- The bedrock beneath the northern portion of the site is mapped as the White Strand Formation (New Code: CNWHIT) described as sandstone and interbedded pyritic mudstone.
- The bedrock beneath the central portion of the site is mapped as the Lispatrik Formation (New Code: CDLPTK) described as pyritic cherty mudstone with dolomite.
- The bedrock beneath the southern portion of the site is mapped as the Cuskinny Member (New Code: CDKINS2) described as flaser-bedded sandstone and mudstone.

There are a series of east-west and north-west/south-east trending structural faults offset the lithological units in the area.

Weathered mudstone was encountered during previous site investigations in the southeast of the site at depths ranging from 2.7mbGL to 3.3mbGL (refer to Section 9.6.8 below). The GIS borehole mapping (GSI, 2025) identifies two (2No.) boreholes (Borehole ID: 1705NWW112 and 1705NWW027) located approximately 700m south of the site, which described a depth to rock of 3.1m and 9.8m respectively.

While there are no bedrock outcrops mapped by the GSI (GSI, 2025) within the site boundary, there are a number of bedrock outcrops mapped within a 2km radius of the site, the closest of which are located approximately 0.36km northwest of the site.

The GSI (GSI, 2025) bedrock geology map is presented in Figure 9-5.

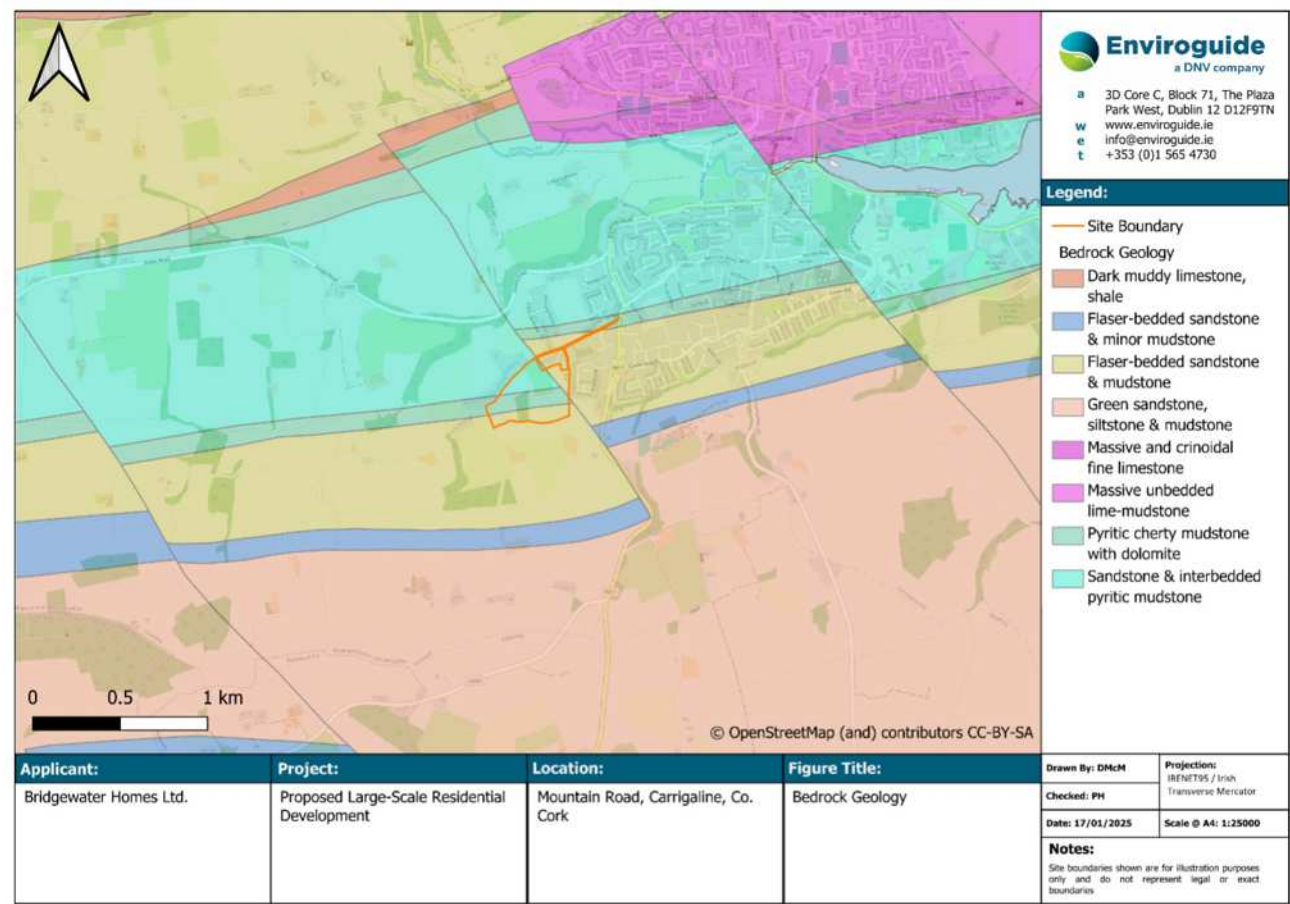


Figure 9-5. Bedrock Geology

9.6.8 Site Investigation

The soils and geology encountered during the site investigation undertaken by PGL in 2018 are summarised as follows. A review and summary of the site investigation data undertaken by PGL in 2024 (PGL, 2024) is included in Volume 3 Appendix 9.1 of this EIAR.

- Topsoil was encountered from ground level to depths ranging from 0.25mbGL to 0.40mbGL.
- The topsoil was underlain by mixed glacial deposits comprising slightly sandy, slightly gravelly SILT with low cobble content to depths of up to 3.6mbGL.
- Weathered mudstone was encountered in the southeast of the site at depths ranging from 2.7mbGL to 3.3mbGL.

Groundwater was encountered at 2.7mbGL (described as a trickle flow rate) at the boundary between the mixed glacial deposits and the weathered Mudstone, at a single trial pit location. Groundwater is assessed in Chapter 10 of this EIAR.

9.6.9 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, 2023). There are a total of seven defined domains across the country. The GSI (GSI, 2025) defined Geochemical Domains map indicates that the site is located within Domain 1 which is characterised as ‘Namurian shale and sandstone’.

A summary of the metal values for Domain 1 are presented below in Table 9-4.

Table 9-4. Geochemically Appropriate Levels for Domain 1

Element	Units	Value
		Domain 1
Arsenic	mg/kg	15.6
Cadmium	mg/kg	1.5
Chromium	mg/kg	51.5
Copper	mg/kg	51.2
Mercury	mg/kg	0.254
Nickel	mg/kg	47.8
Lead	mg/kg	48.3
Zinc	mg/kg	137.0

9.6.10 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 site of the Proposed Development 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’.

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 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).

9.6.11 Geohazards

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

The GSI database (GSI, 2025) indicated that the site is located within an area of 'low' on the landslide susceptibility classification map. Furthermore, there are no recorded landslide events 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 and therefore, there are no identified geological hazards associated with karst features.

Furthermore, based on the results of previous site investigation works, which included trial pitting and geotechnical testing, PGL have concluded that the site is classified as geotechnical category GC-1 and there is no specific geotechnical risk identified at the site of the Proposed Development (PGL, 2024).

9.6.12 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, namely the Ballygarvan Quarry, an extensive quarry cut into a long, prominent, steep-sided limestone ridge, which is flanked on two sides by glacial meltwater channels, is located approximately 3km northwest of the site.

9.6.13 Economic Geology

The lands beneath the site are mapped by the GSI (GSI, 2025) to have no mapped granular aggregate potential.

The bedrock beneath the site has been identified by the GSI (GSI, 2025) as having a low to moderate potential for crushed rock aggregate in the northern portion of the site, a very low potential in the central portion of the site and a high potential in the southern portion of the site.

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

9.6.14 Importance of the Baseline Environment

It is noted that, in accordance with the TII Guidance as documented by the NRA (NRA, 2009) and as outlined in Table 9-1, the soil underlying the site of the Proposed Development would be rated as an attribute of 'medium' geological importance, given that while the southern portion of the Proposed Development is located within an area of 'high' potential for crushed rock aggregate, the majority of the site has very low to moderate potential for crushed rock aggregate and therefore economic extraction would not be considered feasible. Furthermore, the site has no granular aggregate potential and there are no quarries or sites of geological importance within the immediate vicinity of the site.

9.7 The 'Do Nothing' Scenario

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 as the site of the Proposed Development would remain as undeveloped greenfield land.

9.8 Potential Significant Effects

The procedure for determination of potential impacts on the receiving land, soils and geology is to identify potential receptors within the site boundary and surrounding environment and use the information gathered during the desk study, the site walkover and the PGL site investigation 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.

9.8.1 Demolition and Construction Phase

9.8.1.1 Land Take and Land Use

The site is approximately 12.97Ha. The Proposed Development comprises a total developable area of 10.4Ha and will change from undeveloped lands to residential and retail / commercial land use. The lands across the site are zoned as 'Residential (RE)'. Therefore, the change in land use is in accordance with the zoning objectives as set out in the Cork County Development Plan 2022-2028 (CCC, 2022) and it is considered that there will be an unavoidable land take with loss of undeveloped land and soil with a 'negative', 'moderate to significant' and 'permanent' impact taking account of the surrounding land and zoning objectives.

9.8.1.2 Excavation and Removal of Soil and Subsoil

During the demolition and construction phase there will be unavoidable loss of in-situ soils and subsoils from the site as a result of landscape development and to achieve formation levels for the Proposed Development. It is proposed that the excavated soil will be used to build up the site to achieve the required ground levels for the Proposed Development. Excavation of bedrock is not anticipated.

The demolition and construction phase of the Proposed Development will require the excavation of 13,800m³ of soil and subsoil to depths of up to 3.0mbGL to achieve formation levels, for building foundations and for drainage and infrastructure. It is intended to reuse all suitable excavated soil and subsoil for engineering fill and landscaping. The soils underlying the site are considered to have 'medium' importance. Accordingly, there will be a 'negative' 'slight' and 'permanent' impact on the underlying soils at the site.

It is noted that, where required, the removal of unsuitable soil and 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 (as amended). The potential impact with removal offsite of surplus soil and other material as wastes is assessed in Chapter 8 Material Assets: Waste.

9.8.1.3 Soil Quality and Contamination

The site currently comprises undeveloped open grasslands. The excavation and re-use of soil onsite will be subject to control procedures which will include soil quality testing to ensure suitability for use onsite and in accordance with engineering and environmental specification for the Proposed Development. Therefore, the reuse of soils onsite will result in a 'neutral', 'imperceptible' and 'permanent' impact on the quality of shallow soils underlying the site.

There is a potential risk associated with the use of cementitious materials during the construction of subsurface structures (such as building 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 the 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 site of 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.

9.8.1.4 Dust Generation

During the demolition and construction phase, 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 the 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 13 Air Quality of this EIAR.

9.8.1.5 Soil Structure

The excavation and re-use of soil at the site during the demolition and construction phase will result in the exposure of the materials to various elements including weather and construction traffic. The temporary stockpiling of soils and subsoils pending reuse onsite will have a potential 'negative', 'slight' and 'long term' impact on the natural strength of the materials.

9.8.1.6 Importation of Fill Materials

The construction phase of the Proposed Development will require the importation of approximately 16,450m³ of inert soil and subsoil to achieve formation levels and approximately 8,500m³ of aggregate fill materials for the construction of roads and utility infrastructure. The potential impacts may include loss of attributes 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.

9.8.2 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 taking account of the proposed design measures.

The design and construction of the Proposed Development in accordance with current Building Regulations will ensure that the site will be suitable for use during the operational phase as a mixed use residential and retail / commercial development taking account of the geological site setting.

9.8.3 Cumulative Effects

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 1 of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Development.

9.8.3.1 Excavation and Removal of Soil and Subsoil

The offsite removal of excavated soil and 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 1 of this EIAR. All soil and 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'.

9.8.3.2 Import of Fill Materials

The importation of soil, subsoil and aggregate materials to the Proposed Development may be sourced from the same borrow site as other permitted developments detailed in Chapter 1 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.

9.8.4 Summary

Table 9-5 summarises the identified likely significant effects during the demolition and construction phase of the Proposed Development before mitigation measures are applied.

Table 9-5 Summary of Demolition and Construction Phase Likely Significant Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Land Take and Land Use	Negative	Moderate to Significant	Local	Likely	Permanent	Direct
Excavation of Soil and Subsoil	Negative	Slight	Local	Likely	Permanent	Direct
Re-use of Soil and Subsoil Onsite	Neutral	Imperceptible	Local	Likely	Permanent	Direct
Removal of Soil and Subsoil Not Suitable for Re-use Onsite (Where Required)	Neutral	Imperceptible	Regional	Likely	Permanent	Indirect / Cumulative

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Use of Cementitious Materials	Negative	Moderate	Local	Possible	Long-term	Direct
Accidental Release of Deleterious Materials	Negative	Moderate to Significant	Local	Worst-case	Long-term	Direct
Stockpiling of Excavated Soil and Subsoils	Negative	Slight	Local	Possible	Long-term	Direct
Import of Required Soil, Subsoil and Aggregates	Neutral	Imperceptible	Regional	Likely	Permanent	Indirect / Cumulative

Table 9-6 summarises the identified likely significant effects during the operational phase of the Proposed Development before mitigation measures are applied.

Table 9-6 Summary of Operational Phase Likely Significant Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
There are no identified impacts on the receiving land, soil and geological environment during the operational phase of the Proposed Development.						

9.9 Mitigation Measures

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

9.9.1 Demolition and Construction Phase Mitigation

During the demolition and construction phase, all works will be undertaken in accordance with the Outline Construction and Environmental Management Plan (OCEMP) (OSL, 2025b) and Outline Resource and Waste Management Plan (ORWMP) (OSL, 2025c) submitted with the planning application. Following appointment, the contractor will be required to further develop the OCEMP and ORWMP 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 / CEMP and ORWMP / RWMP will be implemented for the duration of the demolition and construction phase covering demolition, construction and waste management activities that will take place during the demolition and construction phase of the Proposed Development.

9.9.1.1 Import of Fill Materials

Contract and procurement procedures will ensure that all imported soil, subsoil and aggregate 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 soil, subsoil and aggregate 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.

9.9.1.2 Soil Quality and Structure

Excavated soil and subsoil will be carefully managed and maintained in order to minimise potential impact on soil quality and soil structure.

As documented in the OCEMP (OSL, 2025b), the stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.

Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration for which subsoil layers are exposed is to be minimised in order to mitigate against weather effects.

Stockpiles of excavated soil and subsoil material will be protected for the duration of the works (refer to Section 9.9.1.5) and will be strategically located to minimise double handling. Furthermore, stockpiles of subsoil material will be located separately from topsoil stockpiles.

9.9.1.3 Airborne Dust

Handling of soils will be undertaken in accordance with documented procedures that will be set out in order to protect the ground and minimise airborne dust. As outlined in the OCEMP (OSL, 2025b), 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. The Contractor will be required to produce an Air Quality and Dust Management Plan including Best Practice Measures to control dust and in particular, measures to prevent dust nuisance. The principal objective of the Air Quality and Dust Management Plan will be to ensure that dust emissions do not cause significant nuisance at receptors near the Proposed Project. A dust deposition monitoring programme will be implemented during the construction phase in order to verify the continued compliance with relevant standards and limits. Potential impacts and avoidance and mitigation measures associated with the generation of dust are addressed in Chapter 13 of this EIAR.

9.9.1.4 Reuse of Soil

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

9.9.1.5 Management and Control of Soils and Stockpiles

Segregation and storage of soil and subsoil for re-use onsite or removal offsite and waste for disposal offsite will be segregated and temporarily stored onsite pending removal or for reuse onsite.

Where possible, stockpiling of soils and subsoils onsite will be avoided. However, in the event that stockpiling is required, stockpiled materials, pending reuse onsite, 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 onsite 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, not suitable for reuse onsite, 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 shall be identified and designated.
- All stockpiles shall be assigned a stockpile number.
- Material identified for reuse onsite, offsite 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.
- 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 drains.

9.9.1.6 Export of Resource (Soil and Subsoil) and Waste

All surplus materials and any waste will be removed offsite in accordance with the requirements outlined in the ORWMP (OSL, 2025c) and will be managed in accordance with all legal obligations. 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 offsite.

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 onsite. Waste collection permits for registered hauliers and certs of registration/ licenses/permits for authorised waste facilities will be kept on file at the 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 offsite 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.

9.9.1.7 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 (OSL, 2025b), concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorised concrete batching plant in full compliance with relevant planning and environmental consents). Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and drainage ditches.

Excess concrete which may need to be removed from foundations/formwork during construction will be contained and removed to a designated area onsite 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.

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.

9.9.1.8 Handling of Fuels, Chemicals and Materials

Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the OCEMP (OSL, 2025b), 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 (OSL, 2025b), any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas. These areas will be located within a designated area placed furthest away from adjacent watercourses / drains and contained within constructed bunded areas (e.g., placed on 150mm concrete slab with the perimeter constructed with 225mm solid blockwork rendered internally).

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 onsite 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 onsite. Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite.

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.

9.9.1.9 Emergency Procedures

Emergency procedures will be developed by the appointed contractor in advance of works commencing and spillage kits will be available onsite including within vehicles operating onsite. Construction staff will be familiar with emergency procedures 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 offsite. 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 onsite 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.

9.9.1.10 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.

9.9.2 Operational Phase Mitigation

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

9.10 Residual Impact Assessment

Residual Impacts are defined as 'effects that are predicted to remain after all assessments 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.

9.10.1 Demolition and Construction Phase

The predicted impacts of the demolition and construction phase of the Proposed Development are described in Table 9-7 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 are no significant residual impacts on land, soils and geology anticipated regarding the demolition and construction phase of the Proposed Development.

Table 9-7. Residual Impacts (Demolition and Construction Phase)

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Construction of the Proposed Development	Land Take and Land Use	The site is approximately 12.97Ha. The Proposed Development comprises a total developable area of 10.4Ha and will change from undeveloped lands to predominantly residential with some commercial uses.	Negative	Moderate to Significant	Permanent	Direct	Unavoidable and no mitigation. The Proposed Development is considered to meet the zoning objectives of the Cork City Development Plan 2022-2028.	Moderate to Significant
Excavation of Soil and Subsoil	Soils	The excavation of soil is a design requirement of the Proposed Development.	Negative	Slight	Permanent	Direct	None required. It is intended to reuse all suitable excavated soil for engineering fill and landscaping.	Slight
Re-Use of Soil and Subsoil Onsite	Soils and Subsoils	It is intended to reuse all suitable excavated soil for engineering fill and landscaping.	Neutral	Imperceptible	Permanent	Direct	The re-use of soil onsite will be subject to control procedures which will include soil quality testing to ensure suitability for use onsite and in accordance with engineering and environmental specification for the Proposed Development.	Imperceptible
Removal of Soil and Subsoil Not Suitable for Re-Use Onsite (Where Required)	Land, Soil and Geology at Receiving Facility	The removal of soil and subsoil during the demolition and 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.	Neutral	Imperceptible	Permanent	Indirect / Cumulative	None required. The removal of all material and waste from the site will be removed offsite in accordance with all statutory legislation.	Imperceptible
Use of Cementitious Materials	Soils and Subsoils	Potential release of cementitious material during construction works for foundations, pavements and infrastructure to the land, soil, and geological environment.	Negative	Moderate	Long Term	Direct	The cementitious materials used during construction will avoid any contamination of soil and geology through the use of appropriate design and methods implemented by the appointed contractor and in accordance with the OCEMP (OSL, 2025b) 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 onsite, through the failure of secondary and tertiary containment or materials handling accident, to the land, soil, and geological environment.	Negative	Moderate to Significant	Long Term	Direct / Worst Case	Refuelling of plant and storage of any deleterious materials including fuels will be undertaken in accordance with the requirements and procedures outlined in the OCEMP (OSL, 2025b).	Imperceptible
Stockpiling of Excavated Soil and Subsoils	Soil Structure	The temporary stockpiling of excavated soils will result in exposure of the materials to various elements including weather.	Negative	Slight	Long-term	Direct	The segregation and stockpiling of soil and stone at the site pending reuse or removal offsite will be carefully managed and maintained in order to minimise potential impact on soil quality.	Slight
Import of Required Soil, Subsoil and Aggregates	Soils and Subsoils	In the unlikely event that aggregate materials are sourced from unlicensed or unauthorised sources, it may result in the importation of uncertified or material not suitable for use at the Proposed Development.	Negative	Slight	Permanent	Indirect	Only certified materials from authorised sources will be used.	Imperceptible
Import of Required Soil, Subsoil and Aggregates	Land, Soil and Geology at the Source Site	The importation of aggregates for the construction of roads and utility infrastructure may include the loss of attributes and changes in the geological regime at the source site.	Neutral	Imperceptible	Permanent	Indirect	None required. The statutory consent process will require the necessary environmental impacts to be assessed and mitigated as appropriate at the source site.	Imperceptible

9.10.2 Operational Phase

The predicted impacts of the operational phase of the Proposed Development are described in Table 9-8 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 are no significant residual impacts on land, soils and geology anticipated regarding the operational phase of the Proposed Development.

Table 9-8. Residual Impacts (Operational Phase)

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
There will be no direct or indirect impact on the receiving land, soils and geological environment associated with the operational phase of the Proposed Development.								

9.10.3 Summary of Post-mitigation Effects

Table 9-9 summarises the identified likely significant residual effects during the demolition and construction phase of the Proposed Development following the application of mitigation measures.

Table 9-9 Summary of Demolition and Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Land Take and Land Use	Negative	Moderate to Significant	Local	Likely	Permanent	Direct
Excavation of Soil and Subsoil	Negative	Slight	Local	Likely	Permanent	Direct
Re-Use of Soil and Subsoil Onsite	Neutral	Imperceptible	Local	Likely	Permanent	Direct
Removal of Soil and Subsoil Not Suitable for Re-Use Onsite (Where Required)	Neutral	Imperceptible	Regional	Likely	Permanent	Indirect / Cumulative
Use of Cementitious Materials	Negative	Imperceptible	Local	Possible	Long-term	Direct
Accidental Release of Deleterious Materials	Negative	Imperceptible	Local	Worst-case	Long-term	Direct
Stockpiling of Excavated Soil and Subsoils	Negative	Imperceptible	Local	Possible	Long-term	Direct
Import of Required Soil, Subsoil and Aggregates	Neutral	Imperceptible	Regional	Likely	Permanent	Indirect / Cumulative

Table 9-10 summarises the identified likely residual significant effects during the operational phase of the Proposed Development post mitigation.

Table 9-10 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
There are no identified residual impacts on the receiving land, soil and geological environment during the operational phase of the Proposed Development.						

9.10.4 Cumulative Residual Effects

It is considered that any cumulative residual impact on lands, soils and geology associated with the excavated soil and subsoil and the importation of aggregates during the construction phase of the Proposed Development will be 'neutral', 'imperceptible' and 'permanent'.

9.11 Risk of Major Accidents or Disasters

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 indicates that the subject site is located within an area of 'Low' susceptibility to landslides. Thus, the impacts of landslides to the Proposed Development are considered 'neutral' 'imperceptible' and 'permanent'.

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

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 are considered 'neutral' 'imperceptible' and 'permanent'.

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.

9.12 Worst Case Scenario

In a 'Worst Case' scenario the potential accidental release of hazardous material including fuels, or other hazardous materials being used onsite during the demolition and construction phase and operational phase of the Proposed Development would present a 'negative', 'moderate to significant' and 'long-term' impact on the receiving land, soils, and geology environment. However, this scenario would only occur through the failure of secondary containment or a major incident on the site. This worst-case scenario is deemed to be unlikely to occur.

9.13 Interactions

9.13.1 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 standards and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers.

9.13.2 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 11 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.

9.13.3 Hydrology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 10 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 the receiving water environment are set out in Chapter 10 of this EIAR.

9.13.4 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 13 of this EIAR.

9.13.5 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 residential and retail / commercial land use with associated landscaping. An assessment of the potential impact of the Proposed Development on the receiving landscape is included in Chapter 5 of this EIAR.

9.13.6 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, where required, unsuitable soil and subsoil will be removed offsite in accordance with all statutory legislation. There is also a requirement to import soil, subsoil and aggregate materials 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 (Waste) are included in Chapter 6 and Chapter 8 of this EIAR respectively.

9.14 Monitoring

9.14.1 Demolition and Construction Phase

During the demolition and 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.
- As documented in the OCEMP (OSL, 2025b), a dust deposition monitoring programme will be implemented during the construction phase in order to verify the continued compliance with relevant standards and limits.
- As documented in the ORWMP (OSL, 2025c), materials management and waste audits will be carried out at regular intervals to monitor the following:
 - Management of soils onsite 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.

9.14.2 Operational Phase

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

9.15 Conclusion

Overall, there are no significant residual impacts on land, soils and geology anticipated regarding the demolition and construction phase and operational phase of the Proposed Development.

9.16 References and Sources

Construction Industry Research and Information Association, 2015. Environmental good practice on site guide (CIRIA -C741).

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

Cork County Council, 2022. Cork County Development Plan 2022-2028.

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

Environmental Protection Agency, 2025. EPA Envision Maps. <https://gis.epa.ie/EPAMaps/>. Consulted on 02/01/2025.

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, 2025. GSI web mapping. <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>. Consulted on 02/01/2025.

Google Earth Pro, 2024. Consulted on 02/01/2025.

Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide.

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.

OSL Butler Consulting Engineers, 2025. Site-Specific Flood Risk Assessment.

OSL Butler Consulting Engineers, 2025. Outline Construction Environmental Management Plan.

OSL Butler Consulting Engineers, 2025. Outline Resource and Waste Management Plan.

Priority Geotechnical Ltd., 2024. Mountain Rd. Housing Development, Carrigaline, Desk Study and Geotechnical Review.

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

CHAPTER TEN

WATER & HYDROLOGY



CHAPTER TEN

Table of Contents

Water & Hydrology

10.1 Introduction..... 10-1

10.2 Expertise & Qualifications 10-1

10.3 Proposed Development..... 10-1

10.4 Methodology 10-3

10.5 Difficulties Encountered 10-5

10.6 Baseline Environment..... 10-5

10.7 The ‘Do Nothing’ Scenario 10-14

10.8 Potential Significant Effects 10-14

10.9 Mitigation Measures 10-17

10.10 Water Framework Directive 10-20

10.11 Residual Impact Assessment 10-20

10.12 Risk of Major Accidents or Disasters 10-23

10.13 Worst Case Scenario..... 10-23

10.14 Interactions 10-23

10.15 Monitoring 10-24

10.16 Conclusion 10-24

10.17 References and Sources 10-24

Table of Tables

Table 10-1. Criteria for Rating Site Importance of Hydrological Features	10-4
Table 10-2. Criteria Assessment of Potential Impacts Terminology and Methodology.....	10-5
Table 10-3. Long Term Mean Monthly Rainfall Data	10-6
Table 10-4. Average Potential Evapotranspiration	10-7
Table 10-5. Vulnerability Mapping Criteria	10-9
Table 10-6. Groundwater Wells and Springs within a 2km Radius of the Site	10-10
Table 10-7. Regional Surface Water Quality	10-11
Table 10-8. WFD Risk and Waterbody Status.....	10-12
Table 10-9. Designated and Protected Sites	10-13
Table 10-10 Summary of Demolition and Construction Phase Likely Significant Effects in the Absence of Mitigation.....	10-17
Table 10-11 Summary of Operational Phase Likely Significant Effects in the Absence of Mitigation	10-17
Table 10-12. Residual Impacts (Demolition and Construction phase) ...	10-21

Table of Figures

Figure 10-1. Proposed Surface Water Catchments (OSL, 2025d).....	10-2
Figure 10-2. Proposed Surface Water Schematic (OSL, 2025d)	10-2
Figure 10-3. Site Location	10-5
Figure 10-4. Existing Site Layout.....	10-6
Figure 10-5. Surface Waterbodies Within 2.0km of the Site.....	10-7
Figure 10-6. Bedrock Aquifer.....	10-9
Figure 10-7. Groundwater Vulnerability	10-10
Figure 10-8. Groundwater Wells, Springs and Source Protection Areas	10-11
Figure 10-9. WFD Status.....	10-12
Figure 10-10. Designated and Protected Sites	10-13

CHAPTER TEN | Water & Hydrology

10.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the Proposed Development on the receiving hydrology and hydrogeology and sets out any required mitigation measures where appropriate.

The principal objectives of this chapter are to identify:

- Hydrological and hydrogeological characteristics of the receiving environment at the site.
- Potential impacts that the Proposed Development may have on the receiving water environment 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.
- Evaluate the significance of any residual impacts.

This chapter of the EIAR should be read in conjunction with Chapter 4 Population and Human Health, Chapter 9 Land, Soils and Geology, Chapter 7 Material Assets: Built Services and Chapter 11 Biodiversity of the EIAR and other information provided by the Applicant pertaining to the design proposals for the Proposed Development.

10.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Gareth Carroll, a Principal Consultant of Enviroguide Consulting.

Gareth Carroll holds a BA in Mathematics and a BAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. Gareth Carroll, a Chartered Environmentalist with the Institute of Environmental Sciences (CEnv) with over 11 years’ experience as an Environmental Consultant, has carried out environmental assessments for a range of project types and geological and hydrogeological Site settings and been involved in the preparation of EIARs for the following projects:

- Large-Scale Residential Development at Wayside, Enniskerry Road and Glenamuck Road, Kilternan, Dublin 18.
- Large-Scale Residential Development at White Car Park Site (Site A) at Blanchardstown Town Centre, Coolmine, Dublin 15.
- Large-Scale Residential Development at lands located at Haggardstown, Dundalk, Co. Louth.

10.3 Proposed Development

The Proposed Development will include the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

The full description of the Proposed Development is outlined in Chapter 2 of this EIAR.

10.3.1 Aspects Relevant to this Chapter

The Proposed Development will include the following components which are of particular relevance with respect to land, soils and geology.

10.3.1.1 Demolition and Construction phase

The demolition and construction phase of the Proposed Development will include:

- The demolition and removal of existing agricultural/farm sheds to the north east of the site.
- Building foundations will consist of traditional shallow strip foundations and ground bearing floor slabs.
- Excavation of soil and subsoil for the construction of building foundations, drainage and other infrastructure to depths of between 1.0 meters below ground level (mbGL) and 3.0mbGL with the excavation of approximately 13,800m³ of soil and subsoil. It is noted that excavation depths will generally be limited to less than 2m with the exception of certain specific parts of the site where deeper excavation depths will be required.
- It is anticipated that there will be no requirement for the excavation of bedrock during the demolition and construction phase of the Proposed Development.
- It is intended to reuse suitable excavated soil and subsoil for landscaping and engineering use. However, where required, the removal of unsuitable soil and subsoil offsite will be undertaken in accordance with all statutory legislation.
- The importation of approximately 16,450m³ of inert soil and subsoil will be required to achieve formation levels.
- The importation of approximately 8,500m³ of aggregate fill materials will be required for the construction of the proposed development (e.g., granular material beneath road pavement, under floor slabs and for drainage and utility bedding / surrounds etc.).
- Temporary stockpiling of excavated material pending re-use onsite.
- The existing hedges and ditches will be retained onsite.
- It is anticipated that excavations for the construction of the Proposed Development will be above groundwater, however, there may be a requirement for management of surface water (rainwater) where encountered within excavations during groundworks.
- Construction of a new surface water drainage designed in accordance with the principles and objectives of Sustainable Drainage Systems (SuDS) and the Greater Dublin Sustainable Drainage System (GDSDS) and the requirements of Cork County Council.
- Construction of new foul drainage and mains water connections in accordance with the requirements of the Building Regulations 1997 in accordance with the recommendations contained in the Technical Guidance Documents, Section H (revised 2005), the Department of the Environment’s Building Regulations “Technical Guidance Document B - Fire Safety (2020, UE’s Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03) and UE’s Code of Practice for Water Infrastructure (IW-CDS-5020-03).

10.3.1.2 Operational Phase

Surface Water Drainage

As documented in the Infrastructure Report (OSL Butler Consulting Engineers (OSL), 2025d), the proposed surface water drainage network, which will accommodate surface water runoff from impermeable surfaces in the Proposed Development (including roadways, roofs, and parking areas), will be managed in accordance with the principles and objectives of Sustainable Drainage Systems (SuDS) and the Greater Dublin Strategic Drainage Study (GDSDS) to treat and attenuate surface water prior to discharging offsite.

The Proposed Development catchment has been subdivided into 10 sub-catchments (refer to Figure 10-1 and Figure 10-2). It is proposed that surface water from each of the catchments will discharge, at a restricted greenfield runoff rate, to the existing 300mm diameter surface water pipe located to the north of the site. The existing surface water drain crosses Mountain Road before eventually discharging to the West Carrigaline River (River Waterbody Code: IE_SW_19O011400) approximately 0.29km north of the site.

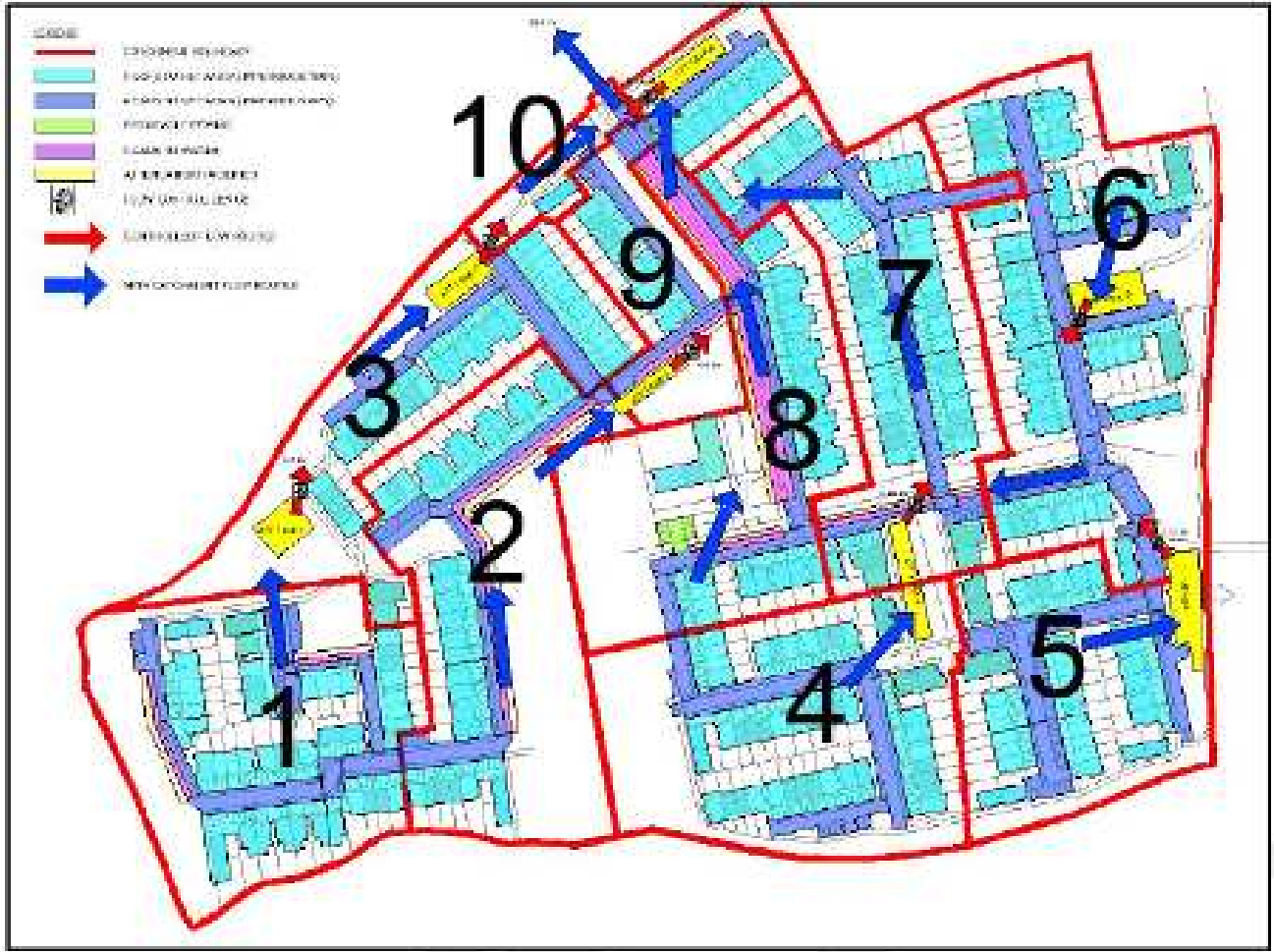


Figure 10-1. Proposed Surface Water Catchments (OSL, 2025d)

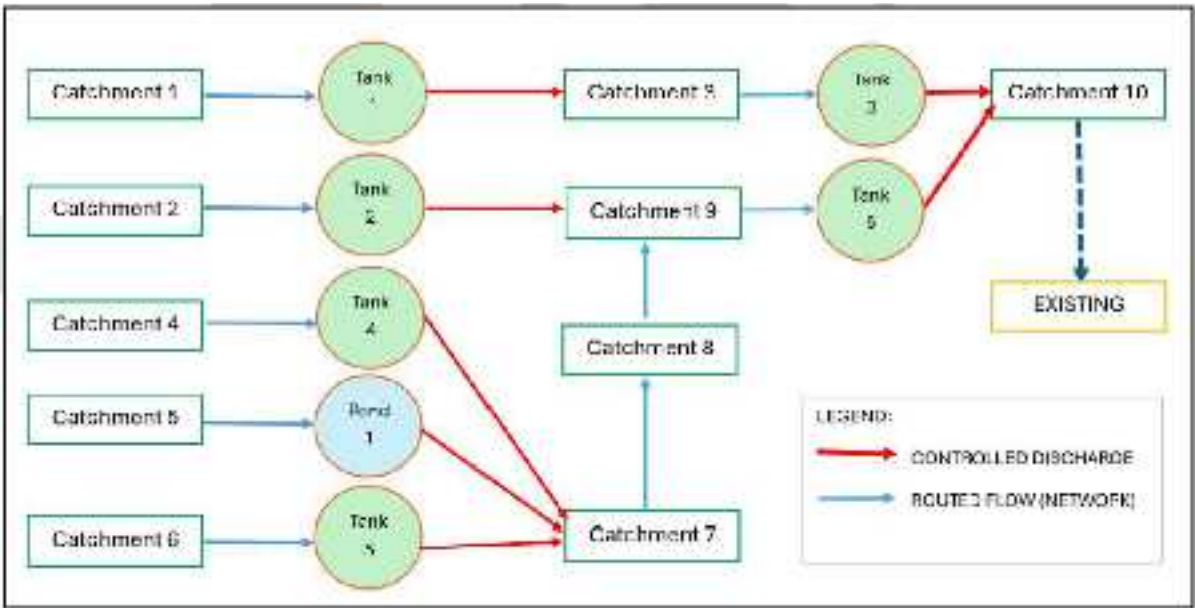


Figure 10-2. Proposed Surface Water Schematic (OSL, 2025d)

The proposed surface water drainage network has been designed to convey run-off associated with a 1 in 100-year return period event. An additional 20% has been allowed for climate change in relation to rainfall intensities.

As detailed in the Infrastructure Report (OSL, 2025d), the following attenuation and SuDS measures will be incorporated into the Proposed Development:

- Petrol Interceptors: Prevent hazardous chemicals and petroleum from entering watercourses and sewers. Appropriately sized interceptors are included in the design.
- Swales: Grass-covered drainage channels adjacent to roads and shared surfaces, treating, conveying, and attenuating runoff while promoting biodiversity.
- Bioretention Raingardens: Located along the main spine road, these manage polluted urban runoff using engineered topsoil, enhancing urban design.
- SuDS Tree Pits: Trees planted in infiltration components or standalone pits to collect, store, and filter runoff, improving soil infiltration capacity.
- Permeable Pavers: Proposed for public car park areas (e.g., creche, amenity parking), these porous surfaces treat rainwater and allow infiltration, reducing runoff.
- Cellular Attenuation System: Six (6No.) underground structures manage sub-catchments, providing water storage and infiltration.
- Basins, Wetlands, and Ponds: One attenuation basin is included for surface water runoff management, designed to a safe depth (less than 600mm) due to site topography.

Foul Water

As documented in the Infrastructure Report (OSL, 2025d), the estimated peak wastewater loading generated by the Proposed Development is estimated at 12,372l/s with the average discharge being 2,062l/s.

Foul water from the Proposed Development will discharge to the existing 375mm diameter foul sewer located approximately 0.625km east of the site in Kilmoney Road (R611). This sewer drains northeastwards towards the pump station (Crosshaven Road WWPS Ringaskiddy) located at Carrigaline Main Road (adjacent to Carrigaline Library). The rising main from the aforementioned pump station discharges to an existing 525mm diameter foul line to the south.

Due to the topography of the site, a portion of the site will require pumping. The proposed foul sewer within the site will allow the majority of the subject lands to be serviced by gravity. There is a portion of the eastern section of the site that will need to be pumped. The pumping station is proposed to be located in a green area close to the eastern boundary of the site.

The UE Confirmation of Feasibility (CoF) letter (UE COF Reference: CDS 24001434) confirms that the wastewater connection is feasible subject to upgrades. The aforementioned upgrade works includes a 300mm diameter foul sewer to be installed from the Proposed Development and connecting to the existing foul sewer in the R611 (Kilmoney Lower Road). The Applicant will ensure that all upgrade works are completed prior to any connection to the UE infrastructure.

It is understood that foul water from the Proposed development will be treated in the Ringaskiddy Wastewater Treatment Plant (WWTP) (Discharge Licence No. D0057-01) before ultimately discharging to the Cork Harbour coastal waterbody (EU Code: IE_SW_060_0000).

Water Supply

As documented in the Infrastructure Report (OSL, 2025d), the estimated peak water demand from the Proposed Development is estimated at 10,459 l/s with the average daily demand being 2,173 l/s.

There is an existing 100mm diameter asbestos watermain located in Mountain Road. This main is serviced/supplied via the existing network located in Kilmoney Road (R611).

The UE Confirmation of Feasibility (CoF) letter (UE COF Reference: CDS 24001434) confirms that the water supply connection is feasible subject to upgrades. The aforementioned upgrade works includes a 150mm diameter water main to be installed from the Proposed Development and connecting to the existing water main in the R611 (Kilmoney Lower Road). The Applicant will ensure that all upgrade works are completed prior to any connection to UE infrastructure.

10.4 Methodology

10.4.1 Relevant Legislation & Guidance

The methodology adopted for the assessment has regard to the relevant guidelines and legislation including:

- Council Directive 2006/118/EEC, 2006. On the protection of groundwater against pollution and deterioration. European Parliament and the Council of European Communities.
- Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy with amendments 2455/2001/EC, 2008/32/EC and 2008/105/EC (Water Framework Directive (WFD)).
- European Commission, 2022. WFD Reporting Guidance 2022. Final Draft V4.
- Local Government, October 2021. No. 1.1977. Local Government (Water Pollution (Amendment) Act.
- Local Government, October 2007. No. 30.2007. Water Services Act 2007.
- Local Government, July 1990. No. 21.1990. Local Government (Water Pollution) (Amendment) Act, 1990.

- Local Government, March 1977. No. 01/1977. Local Government (Water Pollution) Act, 1977 with amendments.
- S.I. No. 722/2003 – European Communities (Water Policy) with amendment S.I. No. 413/2005.
- S.I. No. 489/2011 – European communities (Technical Specifications for the Chemical Analysis and Monitoring of Water Status) Regulations, 2011.
- S.I. No. 122/2010 – European Communities (Assessment and Management of flood Risks) Regulations 2010 including amendment S.I. No. 495/2015.
- S.I. No. 272/2009 - European Communities Environmental Objectives (Surface Waters) Regulations 2009 including amendments S.I. No. 327/2012, S.I. No. 386/2015 and S.I. No. 77/2019.
- S.I. No. 9 of 2010 - European Communities Environmental Objectives (Groundwater) Regulations 2010 including amendments S.I. No. 149 of 2012 and S.I. No. 366 of 201.
- WFD Working Group, 2005. Guidance on the Assessment of the Impact of Groundwater Abstractions (WFD, 2005).

Other guidance used in the assessment of potential impacts on the receiving water environment are referenced where relevant in this EIAR Chapter and include:

- Construction Industry Research and Information Association, 2001. Control of Water Pollution from Construction Sites (CIRIA – C532).
- Construction Industry Research and Information Association, 2015. Environmental Good Practice on Site Guide (CIRIA – C741).
- Construction Industry Research and Information Association, 2016. Groundwater Control: Design and Practice (CIRIA – C750).
- Cork County Council, 2022. Cork County Development Plan 2022-2028.
- Department of the Environment, Heritage and Local Government, Environmental Protection Agency and Geological Survey of Ireland, 1999. Groundwater Protection Schemes (DEHLG/EPA/GSI, 1999).
- Department of the Environment, Heritage and Local Government, 2009. Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, 2009);
- Department of Housing, Planning and Local Government, August 2018. Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (DHPLG, 2018).
- Environmental Protection Agency, 2014. Guidance on the Authorisation of Direct Discharges to Groundwater.
- Environmental Protection Agency, 2013. Guidance on the Management of Contaminated Land and Groundwater at EPA Licensed Sites.
- Environmental Protection Agency, 2013. Storage and Transfer of Materials for Scheduled Activities.
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

10.4.2 Phased Approach

A phased approach was adopted for this EIAR in accordance with 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 initial assessment and impact determination stage was carried out by Enviroguide to establish the project location, type and scale of the Proposed Development, the baseline conditions, and the type of hydrological and hydrogeological environment, to establish the activities associated with the Proposed Development and to undertake an initial assessment and impact determination. This element of the assessment also included developing the Conceptual Site Model (CSM) for the site and receiving environment.

This stage of the assessment included a desk top study that comprised a review of published environmental information for the site. The study area, for the purposes of assessing the baseline conditions for the Hydrology and Hydrogeology Chapter of this EIAR, extends beyond the site boundaries and includes a 2.0km radius of the Proposed Development site and potential receptors outside of this radius that are potentially hydraulically connected with the site were also considered. The extent of the wider study area was based on the Institute of Geologists of Ireland (IGI) Guidelines (IGI, 2013) that recommends a minimum distance of 2.0km radius from the site . The purpose of this increased search radius was to ensure that any potential hydrogeological / hydrological connections to sensitive receptors including habitats were identified.

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

A site walkover survey to establish the environmental site setting and baseline conditions at the site relevant to the hydrological and hydrogeological environment was undertaken by Enviroguide on the 4th of June 2024.

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

- Environmental Protection Agency (EPA) webmapping 2025 (EPA, 2025).
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater webmapping, 2025 (GSI, 2025).
- Google Earth Mapping and Imagery, 2025 (Google Earth, 2025).
- Ordnance Survey Ireland (OSI) webmapping, 2025 (OSI, 2025).
- National Parks and Wildlife Services (NPWS) webmapping, 2025 (NPWS, 2025).
- Teagasc webmapping, 2024 (Teagasc, 2025).
- Office of Public Works (OPW) database on historic flooding and the Catchment Flood Risk Assessment and Management (CFRAM) maps (OPW, 2025).
- Information provided by the Applicant pertaining to the design proposals for the Proposed Development.
 - Site investigation works, which included the excavation of trial pits to depths ranging from 2.9mbGL to 3.6mbGL, were undertaken by Priority Geotechnical Ltd. (PGL) in 2018. The results of the site investigation were used to identify and assess the existing ground conditions and the hydrogeological environment at the site. A review and summary of the site investigation data was undertaken by PGL in 2024 (PGL, 2024) and is included in Volume 3 Appendix 9.1 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 hydrological and hydrogeological 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 demolition and 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 hydrology and hydrogeology sections of the EIAR in this Chapter which includes all the associated figures and documents.

10.4.3 Consultation

A Section 32B of the Planning and Development Act 2000 (as amended) meeting was held with Cork County Council. The relevant findings of the Large-Scale Residential Development (LRD) Opinion Report (Cork County Council, 2024) in respect to hydrology and hydrogeology have been considered in this chapter of the EIAR.

The GSI was consulted on the 18th of June 2024 regarding the Proposed Development. A response was received on the 3rd of July 2024 (GSI Ref. 24/234). The relevant findings of the consultation in respect to hydrology and hydrogeology have been taken into consideration and assessed in this chapter of the EIAR.

Description of Importance of Receiving Environment

The National Roads Authority (NRA) criteria for estimation of the importance of hydrogeological features at the Site during the Environmental Impact Assessment (EIA) stage, as documented by IGI (IGI, 2013) are summarised in Table 10-1.

Table 10-1. Criteria for Rating Site Importance of Hydrological Features

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

10.4.5 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 are described in Table 10-2 as per EPA, 2022 - Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Table 10-2. Criteria Assessment of Potential Impacts Terminology and Methodology

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
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

10.5 Difficulties Encountered

There were no difficulties encountered in the preparation of this Chapter of the EIAR.

10.6 Baseline Environment

10.6.1 Site Location and Surrounding Land Use

The site of the Proposed Development is located at Mountain Road, Kilmoney, Co. Cork. The site is within the southwest settlement boundary of Carrigaline.

The site is accessed via Mountain Road which adjoins the northern boundary of the site. It is noted that as part of the Proposed Development, it is proposed to upgrade Mountain Road to a 5.5m wide carriageway with a 3m shared pedestrian and cycle path to the north of the carriageway to join the previously approved Part 8 junction upgrade at the R611 regional road.

The area surrounding the site is characterised by a mix of land uses, primarily residential and agricultural.

The site is bound to the north by Mountain Road, along which there are a number of individual one-off dwelling houses on both sides of the carriageway, to the south and west by greenfield, agricultural lands, and to the east by the existing Wheatfields residential estate.

The location of the site is presented in Figure 10-3.

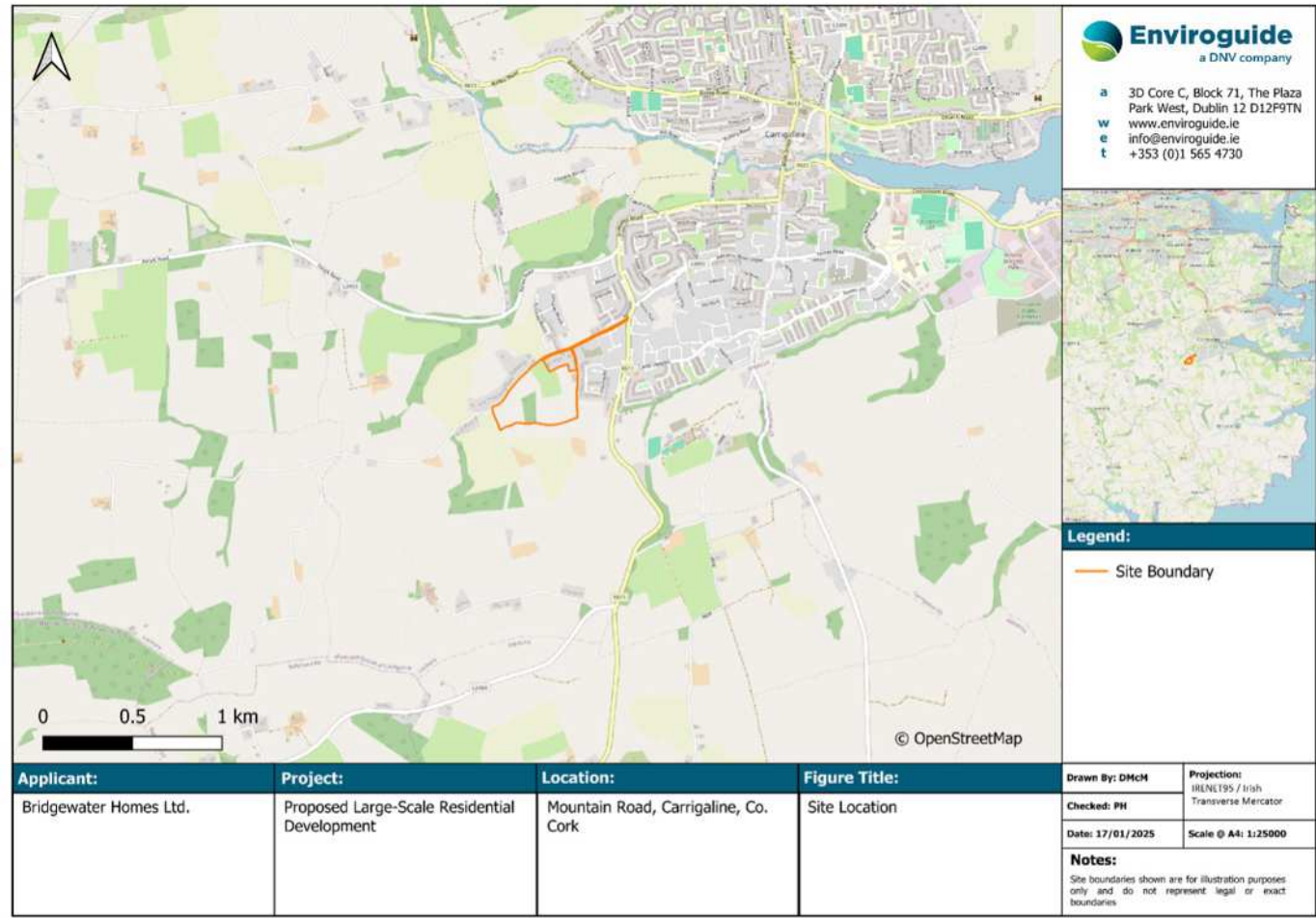


Figure 10-3. Site Location

10.6.2 Current Land Use

The site of the Proposed Development comprises 12.97 hectares (Ha) of undeveloped agricultural lands divided into small fields by existing hedgerows with a small area of woodland comprising mainly willow scrub located within the centre of the site.

The existing site layout is presented in Figure 10-4.

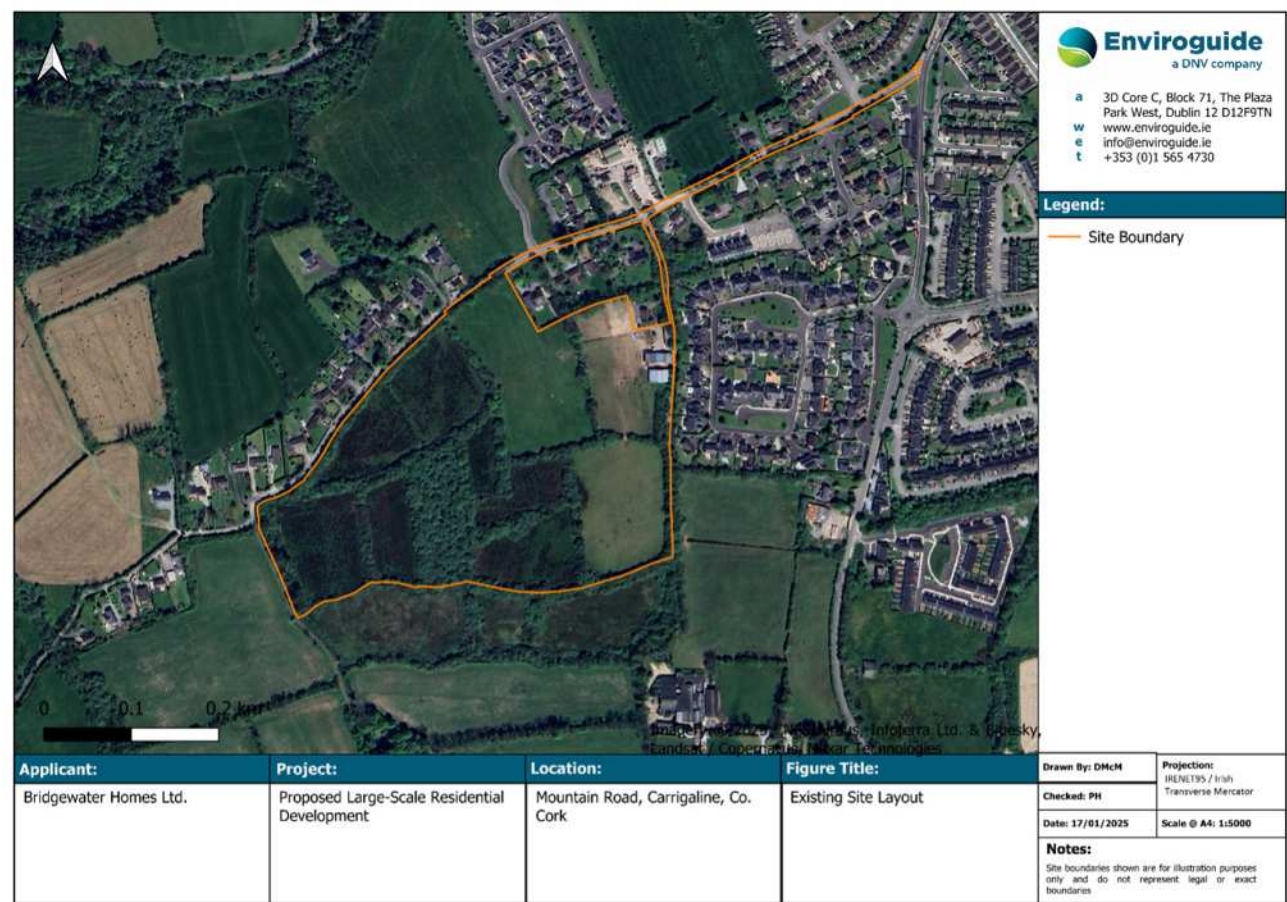


Figure 10-4. Existing Site Layout

10.6.3 Topography

As documented in the Site-Specific Flood Risk Assessment submitted with the planning application (OSL Butler Consulting Engineers (OSL), 2024b), the site slopes from the southwestern corner of the site towards the northeastern corner. The site has a high point in the southwestern corner of the site 62.5 meters above Ordnance Datum (mOD) to a low point in the northeastern corner of the site 52.75mOD.

10.6.4 Soil and Geology

The soils and geology at the subject site are described and assessed in Chapter 9 Land, Soils and Geology of this EIAR and summarised as follows:

- The soils beneath the site have been mapped by the GSI (GSI, 2025) as mineral poorly drained (mainly acidic) Surface Water Gleys / Ground Water Gleys derived from mainly non-calcareous parent materials (IFS Soil Code: AminPD).
- The quaternary sediments beneath the site are mapped by the GSI (GSI, 2025) as till derived from Namurian sandstones and shales (TNSSs).
- The bedrock beneath the site is mapped by the GSI (GSI, 2025) as follows:
- The bedrock beneath the northern portion of the site is mapped as the White Strand Formation (New Code: CNWHIT) described as sandstone and interbedded pyritic mudstone.
 - The bedrock beneath the central portion of the site is mapped as the Lispatrik Formation (New Code: CDLPTK) described as pyritic cherty mudstone with dolomite.
 - The bedrock beneath the southern portion of the site is mapped as the Cuskinny Member (New Code: CDKINS2) described as flaser-bedded sandstone and mudstone
 - There are no karst features mapped by the GSI (GSI, 2025) at the site or within a 2km radius of the site.

The soils and geology encountered during the site investigation undertaken by PGL in 2018 are summarised as follows. A review and summary of the site investigation data undertaken by PGL in 2024 (PGL, 2024) is included in Volume 3 Appendix 9.1 of this EIAR.

- Topsoil was encountered from ground level to depths ranging from 0.25mbGL to 0.40mbGL.
- The topsoil was underlain by mixed glacial deposits comprising slightly sandy, slightly gravelly SILT with low cobble content to depths of up to 3.6mbGL.
- Weathered mudstone was encountered in the southeast of the site at depths ranging from 2.7mbGL to 3.3mbGL

10.6.5 Rainfall

Monthly rainfall data available for 1km x 1km grids (for the period 1991 to 2020) was sourced from Met Éireann (Met Éireann, 2025) and is presented in Table 10-3.

Table 10-3. Long Term Mean Monthly Rainfall Data

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
122.7	91.1	88.6	79.7	74.6	78.5	82.5	89.9	86.5	126.8	122.3	134.9	1178.1
Note: 1km x 1km Irish Grid Coordinated selected for the Site =X (Easting): 172000, Y (Northing): 062000												

The closest the synoptic meteorological station to the site, Cork Airport, is located approximately 7.1km northwest of the site. A summary of the long-term average PE for the period 2020 to 2023 at Cork Airport station (Met Éireann, 2025) is presented in Table 10-4.

Table 10-4. Average Potential Evapotranspiration

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
12.8	20.1	32.1	52.5	71.2	81.7	81.3	69.1	46.1	24.7	13.8	10.9	516.3

Effective Rainfall (ER) is calculated as the difference between total rainfall and actual evapotranspiration. For the site of the proposed development, an average annual rainfall of 1178.1mm/year and an average potential evapotranspiration (PE) of 516.3 mm/year result in an ER value of 661.8mm/year. The Geological Survey Ireland (GSI) has calculated ER value of 718.2mm/year across the site, which aligns closely with the calculated value.

10.6.6 Hydrology

The site is mapped by the EPA (EPA, 2025) as within the Lee, Cork Harbour and Youghal Bay WFD Catchment (Catchment I.D.: 19) and the Owenboy[Cork]_SC_010 WFD Sub-catchment (Sub-Catchment I.D.: 19_15). The northwest portion of the site is mapped by the EPA (EPA, 2025) as within the Owenboy[Cork]_040 WFD River Sub-basin (EU Code: IE_SW_19O011400), while the southeast portion of the site is mapped by the EPA (EPA, 2025) as within the Kilnaglery_010 WFD River Sub-basin (EU Code: IE_SW_19K620850).

The closest EPA mapped (EPA, 2025) surface waterbodies to the site are the Healy's Bridge Stream (WFD Name: Owenboy (Cork)_040; River Waterbody Code: IE_SW_19O011400), the West Carrigaline River (WFD Name: Owenboy (Cork)_040; River Waterbody Code: IE_SW_19O011400) and the Kilnaglery 19 Stream (WFD Name: Kilnaglery_010; River Waterbody Code: IE_SW_19K620850) located approximately 0.24km west, 0.29km north and 0.37km east of the site, respectively.

The Healy's Bridge Stream flows northwest before discharging to the West Carrigaline River approximately 0.44km west of the site. The West Carrigaline River flows in a northeast direction before converging with the Owenboy [Cork] River (River Waterbody Code: IE_SW_19O011400) approximately 1.22km northeast of the site. The Owenboy [Cork] River discharges to the Owenboy Estuary transitional waterbody (Transitional Waterbody Code: IE_SW_060_1200) approximately 1.35km northeast of the site at its closest point. The Owenboy Estuary transitional waterbody flows east before ultimately discharging to the Cork Harbour coastal waterbody (EU Code: IE_SW_060_0000) approximately 8.23km east of the site.

The Kilnaglery 19 Stream flows northeast before discharging to the Owenboy Estuary transitional waterbody approximately 2.55km northeast of the site at its closest point.

Other surface waterbodies within a 2km radius of the site include the following:

- The Kilmoney River (WFD Name: Owenboy (Cork)_040; River Waterbody Code: IE_SW_19O011400) discharges to the West Carrigaline River approximately 0.44km west of the site.
- The Shanagraigue Stream (WFD Name: Owenboy (Cork)_040; River Waterbody Code: IE_SW_19O011400) discharges to the Kilmoney River approximately 1.82km northeast of the site.
- The Upper Ballea Stream (WFD Name: Owenboy (Cork)_040; River Waterbody Code: IE_SW_19O011400) discharges to the Owenboy [Cork] River approximately 1.31km north of the site.

The surface waterbodies within a 2km radius of the site are presented in Figure 10-5.

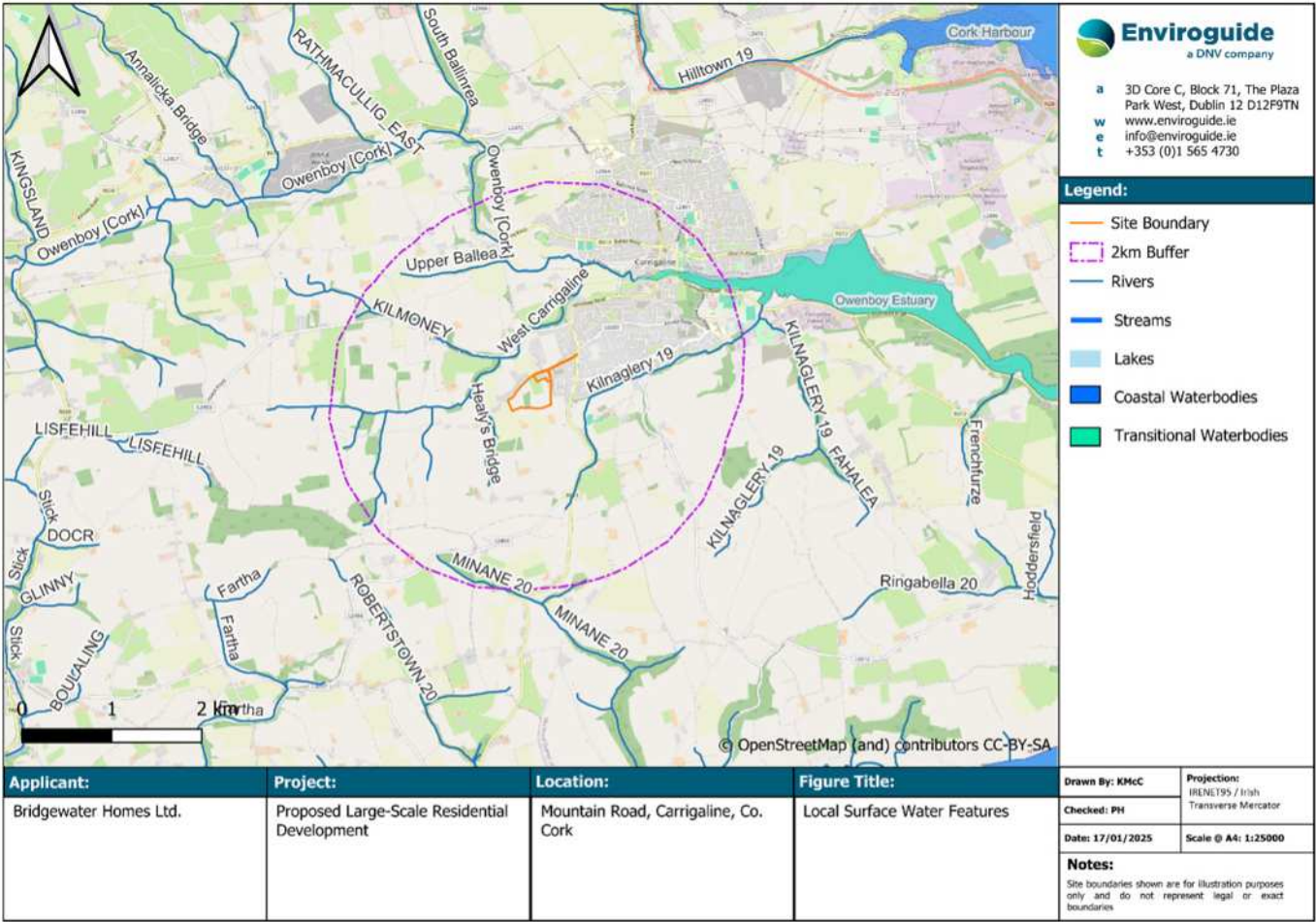


Figure 10-5. Surface Waterbodies Within 2.0km of the Site

10.6.6.1 Site Drainage

There was some drainage ditches identified across the site along field boundaries during the site walkover undertaken by Enviroguide Consulting on the 4th of June 2024. The drainage ditches were observed to be mostly dry at the time of inspection. The central woodland area at the site was observed to be waterlogged at the time of inspection. The surface water associated with the woodland was observed to drain northwards to an existing drainage ditch located at the field boundary. This was the only drainage ditch where standing water was observed. All drainage ditches at the site were observed to be contained within the site boundary with no outflow from the site. Based on the findings of the site walkover, it is considered that all retained surface water infiltrates to groundwater.

There is an existing 300mm diameter surface water pipe to the north of the site, crossing Mountain Road, and eventually discharges into an existing stream running along Forest Road.

There is an existing 225mm diameter foul line within Mountain Road, approximately 300m to the east of the Proposed Development entrance. This existing foul line services the lands adjacent to Mountain Road. This existing foul line connects to a

375mm diameter foul sewer located approximately 625m to the east of the site in Kilmoney Road (R611). These sewers drain north eastwards towards the pump station (Crosshaven Road WWPS Ringaskiddy) located at Carrigaline Main Road (adjacent to Carrigaline Library). The rising main from the aforementioned pump station discharges to an existing 525mm diameter foul line to the south.

10.6.6.2 Flood Risk

The Site-Specific Flood Risk Assessment (SSFRA) report produced by OSL (OSL, 2025a) evaluates the flood risks associated with the Proposed Development. The assessment identifies the primary sources of flood risk as fluvial flooding from the existing stream/drain along the northern boundary of the site, with additional considerations for coastal, pluvial, and groundwater flooding. The site is classified as Flood Zone C, where the probability of flooding is low, and the Proposed Development does not require a justification test as it falls outside Flood Zones A and B.

The SSFRA (OSL, 2025a) outlines the flood risk management strategies, including the sequential approach to avoid, substitute, justify, and mitigate flood risks. The assessment follows the guidelines set out in "The Planning System and Flood Risk Management Guidelines" published in November 2009 by the Department of the Environment, Community and Local Government and the Office of Public Works. The Proposed Development includes measures such as setting the finished floor level above the Flood Zone B level with an appropriate freeboard, regular maintenance of the drainage system, and ensuring overland flow routes are not blocked.

The SSFRA (OSL, 2025a) also incorporates the Cork County Development Plan, which emphasises the importance of flood risk management through policies and land use zoning. The Proposed Development will include flood mitigation measures such as sustainable drainage systems (SuDS), surface water attenuation storage, and emergency access and egress routes during flood events. The detailed flood risk assessment confirms that the Proposed Development will not significantly impact flood levels in the surrounding areas, with surface water runoff being attenuated to greenfield runoff rates before discharging to the existing 300mm diameter surface water pipe located to the north of the site and eventually discharging the West Carrigaline River.

In conclusion, the SSFRA (OSL, 2025a) demonstrates that the flood risks to the Proposed Development can be adequately managed through the implementation of appropriate mitigation measures and adherence to the guidelines set out in the Cork County Development Plan and the Planning System and Flood Risk Management Guidelines. The Proposed Development will not adversely impact flood risk in the surrounding areas, and the inclusion of SuDS measures will ensure that the flood risk to the Proposed Development and adjacent properties is minimised.

10.6.7 Hydrogeology

10.6.7.1 Groundwater Body

The EPA (EPA, 2025) maps the groundwater body (GWB) beneath the site as the Ballinhassig East GWB (EU Code: IE_SW_G_004). The GWB descriptor for the Ballinhassig East GWB (GSI, 2025) notes that the Ballinhassig East GWB occupies an area of 1,762m² across Co. Cork.

As documented in the GWB descriptor (GSI, 2025), the main recharge mechanisms in the Ballinhassig East GWB are via rainfall infiltrating through the subsoil or areas of exposed bedrock. The subsoils, which are generally of moderate

permeability, do not restrict recharge. However, due to the typically low permeability of the aquifers within this GWB, combined with steep slopes, much of the recharge will discharge rapidly to surface watercourses via the upper layers of the aquifer. This process limits the available groundwater resources within the aquifer.

The main discharges are to the rivers and streams crossing the sandstones, mudstones, shales, and impure limestone formations, as well as small springs and seeps. There is also groundwater discharge along the coastline, with localised seepages potentially forming on cliff faces. Some cross-flow might occur from this GWB to adjacent karstic GWBs, such as the Ringaskiddy GWB.

Groundwater flow is expected to occur through fractures and faults, although these fractures are likely to have low permeability and limited interconnectivity, mostly confined to localised zones. As a result, groundwater flow paths are generally short, ranging from about 30 to 300 meters. Groundwater typically discharges to small springs or streams within the aquifer. Groundwater flow directions are anticipated to align with the local surface water catchments, suggesting that groundwater in the northeast portion of the site likely flows to the west and north towards the Healy's Bridge Stream and West Carrigaline River, located approximately 0.24km west and 0.29 km north of the site respectively, while groundwater in the southeast portion of the site likely flows to the east / southeast towards the Kilnaglery 19 Stream, located approximately 0.37km east of the site.

10.6.7.2 Aquifer Classification

The bedrock aquifer beneath the site is classified by the GSI (GSI, 2025) as a locally important aquifer which is moderately productive only in local zones (LI).

Locally important aquifers are capable of supplying locally important abstractions (e.g. smaller public water supplies, group schemes), or 'good' yields (100-400 m³/d). Due to the low permeability and poor storage capacity of aquifers which are moderately productive only in local zones, the aquifer will have a low 'recharge acceptance'. Some recharge in the upper, more fractured/ weathered zone is likely to flow along the relatively short flow paths and rapidly discharge to streams, small springs and seeps. Groundwater discharge to streams ('baseflow') can significantly decrease in the drier summer months.

The bedrock aquifer map is presented in Figure 10-6.

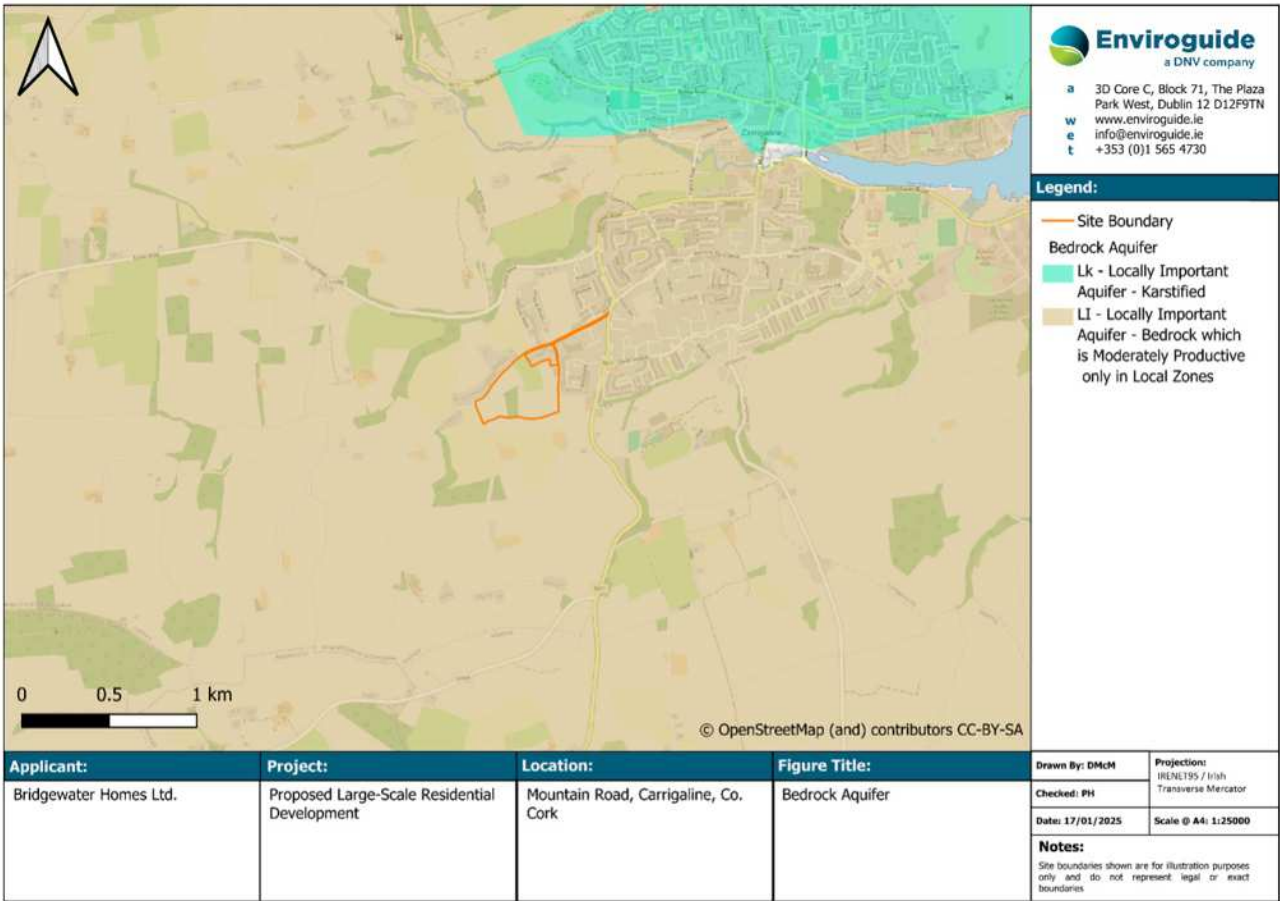


Figure 10-6. Bedrock Aquifer

10.6.7.3 Recharge

The GSI groundwater recharge map provides an estimate of the average amount of rainwater that percolates through the subsoils to the water table over a year. The map accounts for rainfall that percolates diffusely through soils and subsoils, it does not consider water that enters aquifers at points (e.g., at sinkholes) or along linear features (e.g., along sinking streams/rivers). Groundwater recharge amounts are estimated by considering soil drainage, subsoil permeability, thickness and type, the ability of the aquifer to accept the recharge, and rainfall.

As detailed in Section 10.6.5, an ER value of 661.8mm/year has been calculated for the site of the proposed development. The GSI (GSI, 2025) has identified a recharge coefficient of 25% of effective rainfall for the aquifer beneath the site, resulting in a calculated average recharge of 165.45mm/year, compared to the GSI recorded value of 179.54 mm/year. The low recharge potential is due to the presence of low permeability subsoil overlying the locally important aquifer which is moderately productive only in local zones (LI).

10.6.7.4 Aquifer Vulnerability

The vulnerability categories, and methods for determination, are presented in the Groundwater Protection Schemes publication (DEHLG/EPA/GSI, 1999) and summarised in Table 10-5. The publications state that ‘as all groundwater is hydrologically connected to the land surface, it is the effectiveness of this connection that determines the relative vulnerability to contamination.’ Groundwater that readily and quickly receives water (and contaminants) from the land surface is considered to be more vulnerable than groundwater that receives water (and contaminants) more slowly and in lower quantities. The travel time, attenuation capacity and quantity of contaminants are a function of the following natural geological and hydrogeological attributes of any area.

Table 10-5. Vulnerability Mapping Criteria

Subsoil Thickness	Hydrogeological Requirements				
	Diffuse Recharge			Point recharge	Unsaturated Zone
	Subsoil Permeability & Type			(Swallow holes, losing streams)	(sand & gravel aquifers only)
	High permeability (sand & gravel)	Moderate permeability (sandy subsoil)	Low permeability (clayey subsoil, clay, peat)		
0-3m	Extreme	0-3m	Extreme	Extreme (30m radius)	Extreme
3-5m	High	High	High	N/A	High
5-10m	High	High	Moderate	N/A	High
>10m	High	Moderate	Low	N/A	High
Notes: (i) N/A = not applicable (ii) Permeability classifications relate to the material characteristics as described by the subsoil description and classification method.					

The GSI has assigned a groundwater vulnerability rating of ‘High’ (H) for the groundwater beneath the majority of the site and a vulnerability of rating of ‘Moderate’ (M) for the groundwater beneath the eastern portion of the site (GSI, 2025).

The anticipated depth to bedrock based on the ‘High’ to ‘Moderate’ groundwater vulnerability rating and low permeability subsoils is between 3.0mbGL and 10.0mbGL. As documented in the PGL Desk Study and Geotechnical Review (PGL, 2024), during the site investigation undertaken at the site by PGL in 2018, weathered mudstone was encountered in the southeast of the site at depths ranging from 2.7mbGL to 3.3mbGL. Therefore, an overall groundwater vulnerability rating of ‘High’ (H) is considered appropriate for the site of the Proposed Development.

The groundwater vulnerability rating map is provided in Figure 10-7.

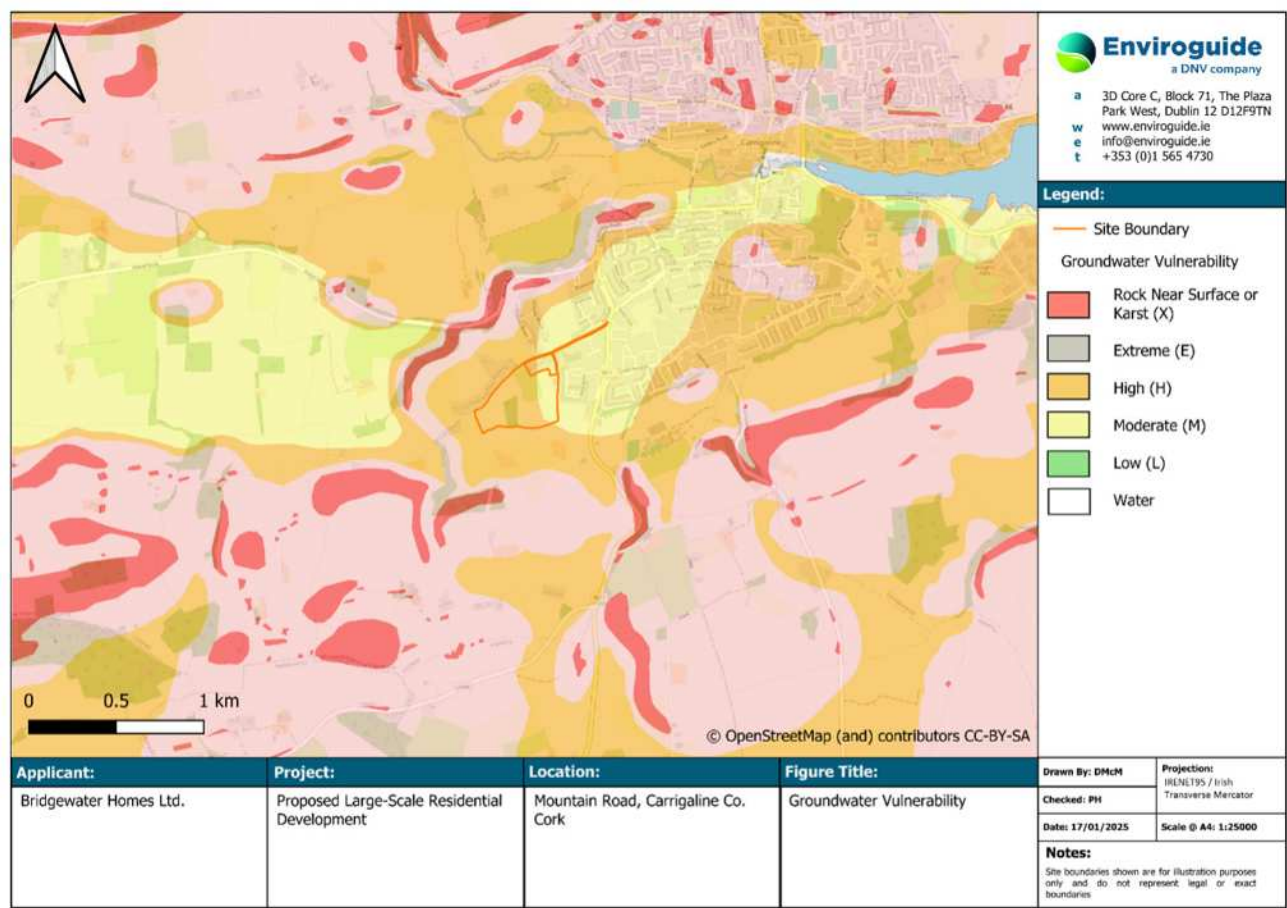


Figure 10-7. Groundwater Vulnerability

10.6.7.5 Site Hydrogeology

As documented in the PGL Desk Study and Geotechnical Review (PGL, 2024), during the site investigation undertaken at the site by PGL in 2018, groundwater was encountered at 2.7mbGL (described as a trickle flow rate) at the boundary between the mixed glacial deposits and the weathered Mudstone, at a single trial pit location. Groundwater was not encountered at the remaining site investigation locations.

10.6.8 Water Use and Drinking Water Source Protection

A review of the GSI wells and springs database (GSI, 2025) has identified seventeen (17No.) sources within a 2km radius of the site (refer to Figure 10-8). These are summarised in Table 10-6 below.

Table 10-6. Groundwater Wells and Springs within a 2km Radius of the Site

Property	Review of Data
Type	17No. Boreholes.
Source Use	The source use for the seventeen (17No.) supplies are: 2No. Agricultural and Domestic Use. 1No. Domestic Use. 14No. Unknown Use.
Yield	Yield classifications are listed for fifteen (15No.) of the seventeen (17No.) wells and springs. The yield classifications are summarised as follows: 10No. are Poor. 4No. are Moderate. 1No. is Good. The reported yield ranged from 21.8m³/day to 109m³/day.
Depth to Bedrock	The depth to bedrock was recorded for all seventeen (17No.) boreholes and ranged from 1.4mbGL to 12.2mbGL.

There is no existing water supply at the site. The site is located in an area serviced by mains water supply. There is an existing 100mm diameter asbestos watermain located in Mountain Road. This main is serviced/supplied via the existing network located in Kilmoney Road (R611).

There are no groundwater source protection areas (SPAs) identified by the GSI (GSI, 2025) at the site or within a 2km radius of the site. The closest groundwater SPA, the Minane Bridge Public Water Supply (PWS), is located approximately 4.14km southeast and upgradient of the site and therefore there is no identified hydraulic connection. identified by the EPA (EPA, 2025) at the site or within a 2km radius of the site. The location of the groundwater wells springs and SPAs are presented in Figure 10-8.

There are no surface water drinking water sources, under Article 7 of the Water Framework Directive,

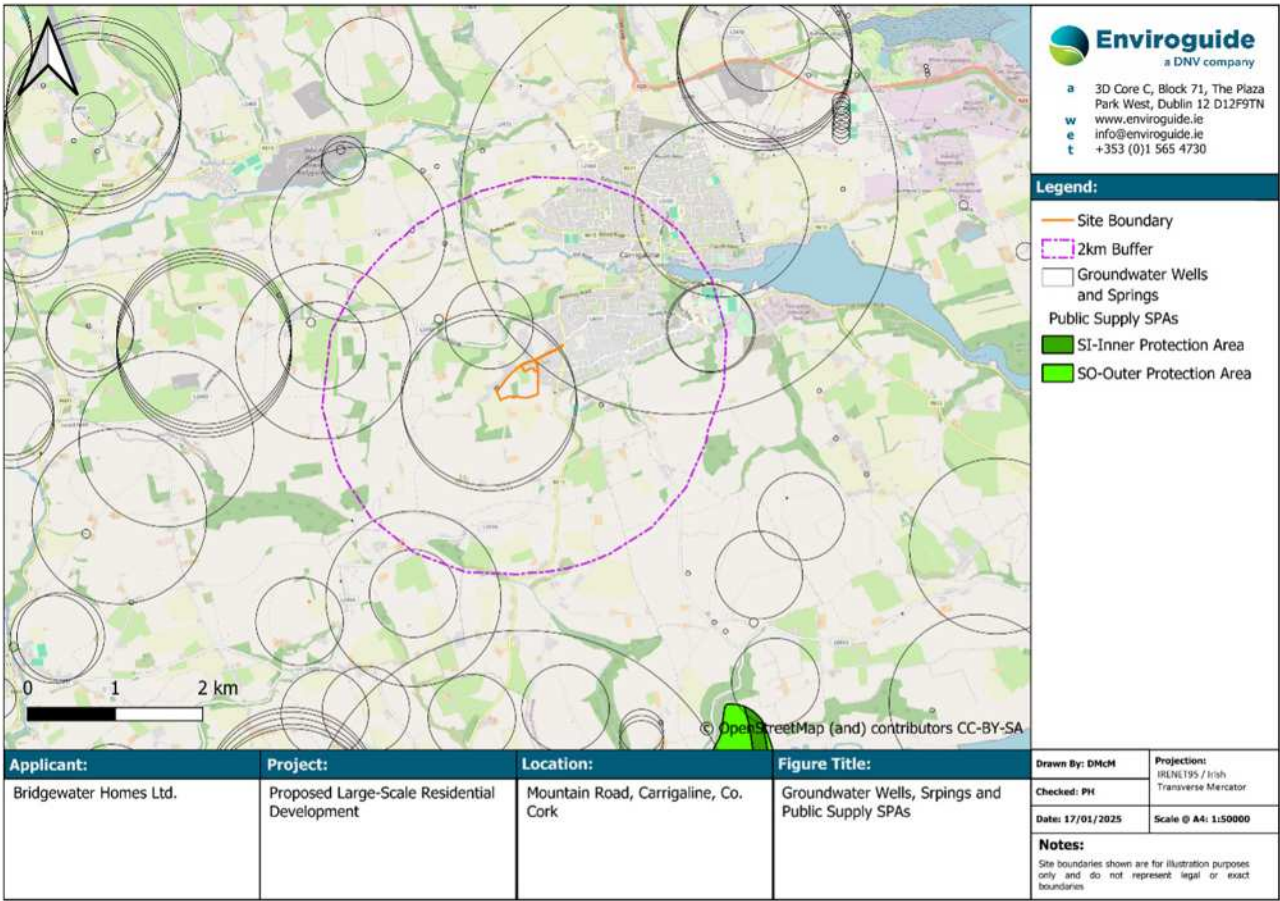


Figure 10-8. Groundwater Wells, Springs and Source Protection Areas

10.6.9 Baseline Water Quality

10.6.9.1 Published Regional Surface Water Quality

The EPA surface water quality monitoring database (EPA, 2025) was consulted and there is available EPA water quality monitoring data (EPA, 2025) published for the Blackwater [Munster] River.

A summary of the most recent EPA water quality monitoring data (EPA, 2025) published for the monitoring stations relevant to the site is presented in Table 10-7.

Table 10-7. Regional Surface Water Quality

WFD Waterbody I.D. (Location*)	Station Name (Location*)	EPA WFD Parameter Quality & Trend Analysis			
		Parameter	Indicative Quality	Trend	Baseline Conc. (2017)
Owenboy (Cork)_040 (0.24km west and downstream of the site)	Ballea Br (Lower) (1.54km northeast and upstream of the site)	Ammonia – Total (as N)	Good	Downwards	0.041mg/l
		Total Oxidised Nitrogen (as N)	Moderate	Upwards	4.66mg/l
		ortho-Phosphate (as P)- unspecified	Good	Upwards	0.035mg/l
Kilnaglery_010 (0.37km east and downstream of the site)	No Published Water Quality Data Available				
Owenboy Estuary (1.35km northeast and downstream of the site)	No Published Water Quality Data Available				
Cork Harbour (8.23km east and downstream of the site)	N/A	Chlorophyll	High (Summer)	Downwards	4.4mg/m³
			High (Winter)	Downwards	1.1mg/m³
		Total Oxidised Nitrogen (as N)	Good (Summer)	Downwards	0.0490mg/l
			Good (Winter)	Downwards	1.033mg/l
		Dissolved Inorganic Nitrogen (as N)	High (Summer)	Downwards	20.5ug/l
			Good (Winter)	Downwards	35.0ug/l
Outer Cork Harbour (8.21km east and downstream of the site)	N/A	Chlorophyll	High (Summer)	Downwards	1.8mg/m³
			High (Winter)	Downwards	0.5mg/m³
		Dissolved Inorganic Nitrogen (as N)	High (Summer)	Downwards	0.034mg/l
			Good (Winter)	Downwards	0.204mg/l
		ortho-Phosphate (as P)- unspecified	High (Summer)	Downwards	2.50ug/l
			High (Winter)	Downwards	16.00ug/l
Western Celtic Sea (9.06km southeast and downstream of the site)	No Published Water Quality Data Available				
Notes: ‘**’ = Distance measured as the closest point to the site.					

10.6.9.2 Published Regional Groundwater Quality

The EPA (EPA, 2025) groundwater monitoring data was reviewed and there are no groundwater quality monitoring stations within a 2km radius of the site or that are hydraulically connected to the site.

10.6.9.3 Receiving Water Quality – Ringaskiddy Wastewater Treatment Plant

Foul water from the Proposed Development will discharge via the Ringaskiddy Wastewater Treatment Plant (WWTP) to the Cork Harbour coastal waterbody. The Ringaskiddy WWTP is operated under relevant statutory approvals. The most recent available Annual Environmental Report (AER) for the Ringaskiddy WWTP is 2022 (Uisce Éireann, 2024). The AER identified that the final effluent was non-compliant with the Emission Limit Values (ELV) specified in the discharge license (D0057-01). The parameters failing to meet their ELV's included biochemical oxygen demand (BOD), chemical oxygen demand (COD), pH, Total Suspended Solids (TSS) and Total Nitrogen (Uisce Éireann, 2024).

While exceedances in the ELV's are noted, the following is also relevant under the significance of results section of the AER:

- 'The discharge from the wastewater treatment plant does not have an observable impact on the water quality.'
- 'The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status.'
- 'The discharge from the wastewater treatment plant does not have an observable impact on the designated shellfish water quality.'

10.6.10 Water Framework Directive Status

The WFD status for river, lake, groundwater, transitional and/or coastal water bodies that have a potential hydraulic connection to the site as recorded by the EPA (EPA, 2025) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Table 10-8 and Figure 10-9.

Table 10-8. WFD Risk and Waterbody Status

Waterbody Name	Waterbody EU Code	Location*	WFD water body status (for the period of 2016-2021)	WFD 3rd cycle Risk Status
River Waterbodies				
Owenboy (Cork)_040	IE_SW_19O011400	0.24km West and Downstream	Moderate	At Risk
Kilnaglery_010	IE_SW_19K620850	0.37km Southeast and Downstream	Good	Review
Transitional Waterbodies				
Owenboy Estuary	IE_SW_060_1200	1.35km Northeast and Downstream	Moderate	At risk

Waterbody Name	Waterbody EU Code	Location*	WFD water body status (for the period of 2016-2021)	WFD 3rd cycle Risk Status
Coastal Waterbodies				
Cork Harbour	IE_SW_060_0000	8.23km East and Downstream	Moderate	At risk
Outer Cork Harbour	IE_SW_050_0000	8.21km East and Downstream	Moderate	Not at risk
Western Celtic Sea	SW_010_0000	9.06km Southeast and Downstream	High	Not at risk
Groundwater Bodies				
Ballinhassig East GWB	IE_SW_G_004	Underlying the Site	Good	Not At risk
Notes: '*' = Distance measured as the closest point to the site.				

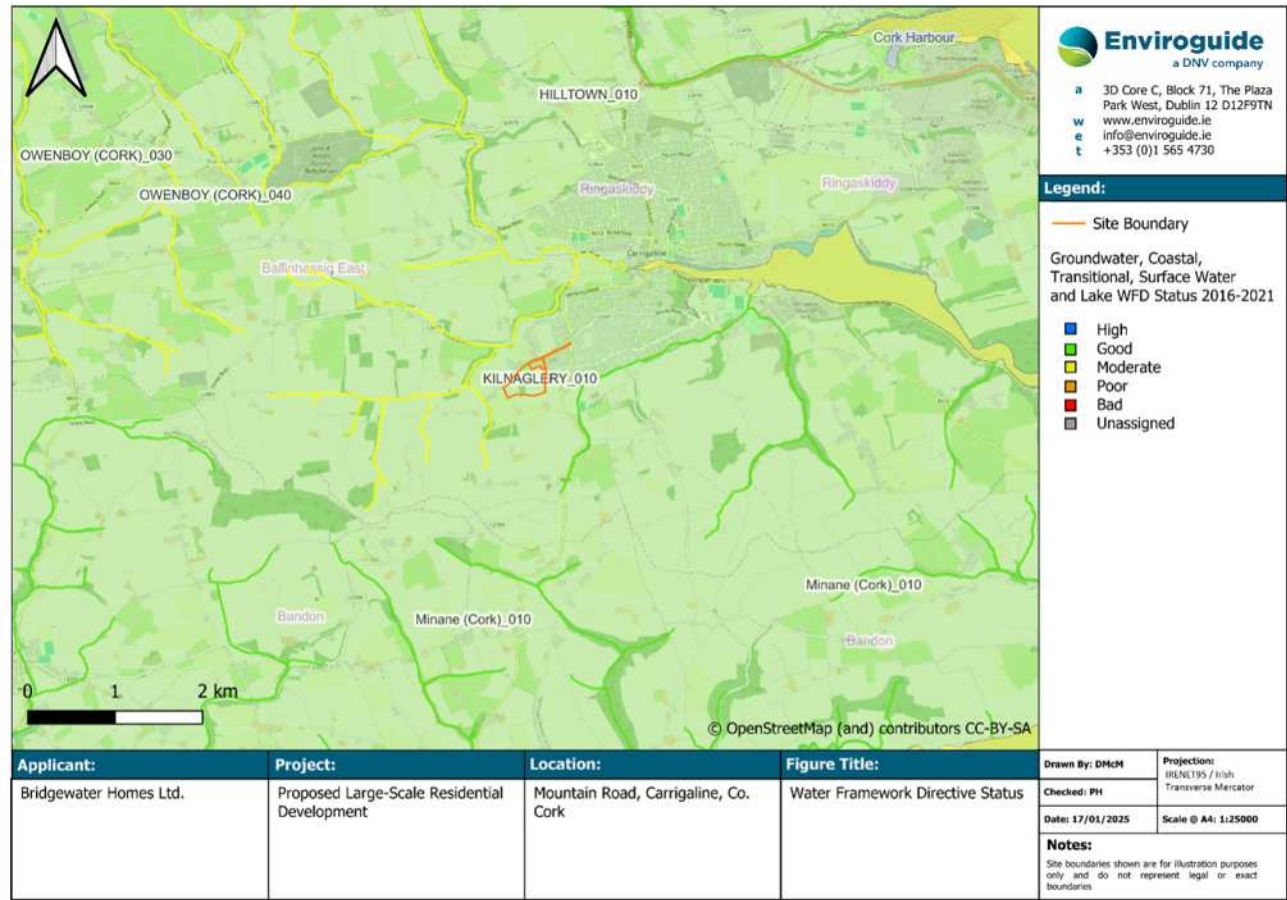


Figure 10-9. WFD Status

10.6.10.1 Nature Conservation

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of Special Areas of Conservation (SACs) and the Birds Directive (2009/147/EC) seeks to protect birds of special importance by the designation of Special Protection Areas (SPAs). SACs and SPAs are collectively known as Natura 2000 or European sites (referred to hereafter as Natura 2000 site).

National Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with SAC and/or SPA Sites. Although many NHA designations are not yet fully in force under this legislation (referred to as ‘proposed NHAs’ or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

There is one (1No.) Natura 2000 site that is identified with a potential hydraulic connection to the site and the Proposed Development. There are also six (6No.) pNHAs identified with a potential hydraulic connection to the site and the Proposed Development. The Natura 2000 sites and other protected and designated sites or areas with a potential hydraulic connection to the site are summarised in Table 10-9.

The Natura 2000 sites are assessed and described in further detail in Chapter 11 - Biodiversity of this EIAR.

Table 10-9. Designated and Protected Sites

Designated Site	Site Code	Distance from Site*	Direction	Potential Risk
Special Protection Area (SPA)				
Cork Harbour SPA	004030	1.77km	Northeast	Yes, hydraulic connection via groundwater discharge to the Healy's Bridge Stream, the West Carrigaline River, the Kilnaglery 19 Stream. There is also a hydraulic connection via the Ringaskiddy WWTP and associated discharges to Cork Harbour.
Proposed Natural Heritage Area (pNHA)				
Owenboy River	001990	1.77km	Northeast	Yes, hydraulic connection via groundwater discharge to the Healy's Bridge Stream, the West Carrigaline River, the Kilnaglery 19 Stream. There is also a hydraulic connection via the Ringaskiddy WWTP and associated discharges to Cork Harbour.
Lough Beg (Cork)	001066	5.98km	Northeast	Yes, indirect hydraulic connection via Cork Harbour.
Rostellan Lough, Aghada Shore and Poul nabibe Inlet	001076	12.86km	Northeast	
Whitegate Bay	001084	10.72	Northeast	
Monkstown Creek	001979	5.01	Northeast	
Cuskinny Marsh	001987	11.61km	Northeast	
Note: ‘*’ = Distance is measured distance downstream along potential hydraulic linkages				

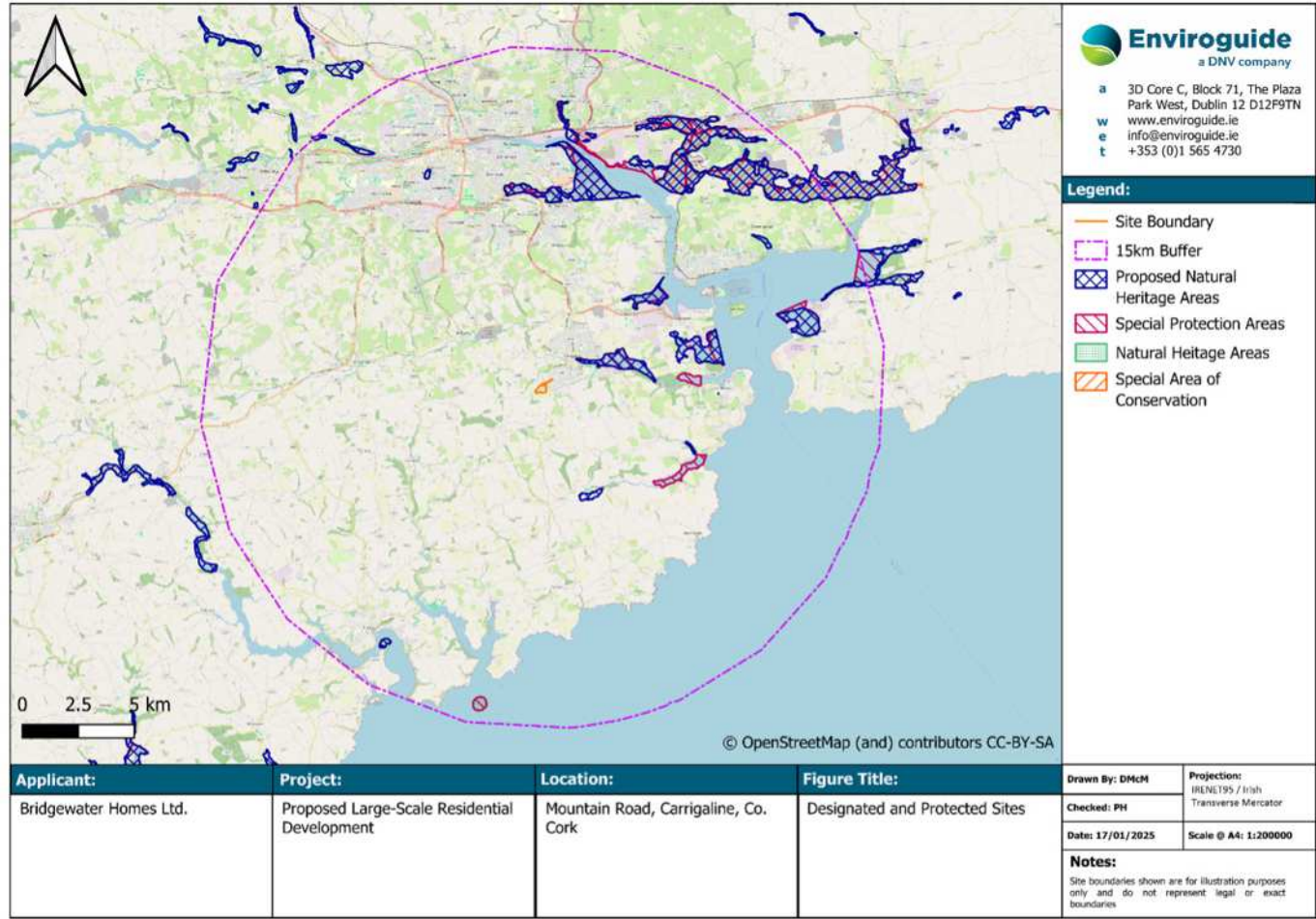


Figure 10-10. Designated and Protected Sites

10.6.10.2 Drinking Water

The river drinking water protected areas (DWPA) are represented by the full extent of the WFD river waterbodies from which there is a known qualifying abstraction of water for human consumption as defined under Article 7 of the WFD.

As identified in Section 10.6.8, there are no surface water drinking water sources, under Article 7 of the Water Framework Directive, identified by the EPA (EPA, 2025) at the site or within a 2km radius of the site.

10.6.10.3 Shellfish Areas

Although the Shellfish Waters Directive (SWD) has been repealed, areas used for the production of shellfish that were designated under the SWD, are protected under the WFD as ‘areas designated for the protection of economically significant aquatic species’.

The requirement from a WFD perspective is to ensure that water quality does not impact on the quality of shellfish produced for human consumption. In Ireland, 64 areas have been designated as shellfish waters (S.I. No. 268 of 2006, S.I. No. 55 of 2009, S.I. 464 of 2009).

There are three (3No.) SWD areas located approximately 14.38km northeast of the site along the eastern shore of Cork Harbour namely the Rostellan North, the Rostellan South and the Rostellan West.

10.6.10.4 Nutrient Sensitive Areas

EU member states are required under the Urban Wastewater Treatment Directive (91/271/EEC) to identify nutrient-sensitive areas. These have been defined as “natural freshwater lakes, other freshwater bodies, estuaries and coastal waters which are found to be eutrophic or which in the near future may become eutrophic if protective action is not taken”.

There are no identified designated nutrient sensitive waterbodies identified to be hydraulically connected with the site (EPA, 2025).

10.6.10.5 Bathing Waters

Bathing waters are designated under Regulation 5 of Directive 2006/7/EC. Designated Bathing Waters exist under S.I. No. 79/2008 and S.I. No. 351/2011 Bathing Water Quality (Amendment) Regulations 2011. EC Bathing Water Profiles - Best Practice and Guidance 2009.

The closest designated bathing water location is Fountainstown located approximately 7.3km southeast of the site.

10.6.11 Importance of Receiving Environment

The bedrock aquifer beneath the site is classified by the GSI (GSI, 2025) as a locally important aquifer which is moderately productive only in local zones. The WFD status has been assigned as ‘good’ for the Ballinhassig East GWB.

The receiving surface water bodies have been assigned a WFD status of ‘moderate’ and ‘good’ for the Owenboy (Cork)_040 and the Kilnaglery_010 respectively, the closest river waterbodies hydraulically connected to the site.

Overall, taking account of the receiving hydrological environment, in accordance with the criteria set out in Table 10-1, the site is considered to be of ‘moderate’ to ‘extremely high’ importance taking into account the underlying locally important aquifer and the identified indirect hydraulic connection to the Owenboy River pNHA and Cork harbour SPA via groundwater discharges to the Healy's Bridge Stream, the West Carrigaline River and the Kilnaglery 19 Stream.

10.7 The ‘Do Nothing’ Scenario

The ‘Do Nothing’ scenario assesses the potential impact on the receiving hydrological and hydrogeological environment if the Proposed Development did not proceed.

If the Proposed Development did not proceed the site would remain as undeveloped lands and there would be no change to the drainage at the site or to the hydrological and hydrogeological regime at the site.

10.8 Potential Significant Effects

The procedure for determination of potential impacts on the receiving hydrology and hydrogeology is to identify potential receptors within the site boundary and surrounding environment and use the information gathered during the desk study, the site walkover and the PGL site investigation to assess the degree to which these receptors will be impacted upon in the absence of mitigation.

10.8.1 Demolition and Construction phase

10.8.1.1 Hydrological and Hydrogeological Flow Regime

Temporary diversions of water courses are not required and there will be no direct discharge to surface water during the demolition and construction phase of the Proposed Development. Therefore, there will be no impact on the hydrology or surface water flow regime within receiving surface water bodies during the demolition and construction phase of the Proposed Development.

It is anticipated that excavations for the construction of the Proposed Development will be above groundwater with no requirement for dewatering and no impact on the local groundwater resource and groundwater flow regime.

There will be no abstraction of water for use during construction works (i.e. dust suppression, welfare facilities). Water supply will be from mains supply in accordance with a connection agreement from UE and therefore there will be no impact on water resources.

10.8.1.2 Water Quality

Sources of contamination that could impact on water quality arising during the demolition and construction phase of the Proposed Development include:

- Storage and use of fuels, oils and chemicals used during construction which in the event of an accidental release could infiltrate to the underlying groundwater or migrate via surface water runoff to onsite surface water drainage ditches.
- Use of concrete and cementitious materials during construction in particular for below ground structures and foundations.
- Runoff with entrained sediment or other contaminants from stockpiled soils to onsite surface water drainage ditches.
- Sediment or contaminants entrained in surface water (rainwater) within excavations during dewatering.
- Accidental release of wash water or foul water from facilities at the site (e.g., wheel wash and temporary welfare facilities).
- Release of foul water during connection to live sewers.

The potential pathway and pollutant linkages for the demolition and construction phase are identified as:

- Infiltration of contaminants through subsoils and /or exposed bedrock during excavations and groundworks where the groundwater vulnerability is increased and there is a more direct pathway for surface contaminants to the underlying aquifer.
- Sediment released during rainfall events entering onsite surface water drainage ditches and infiltration to groundwater.
- Lateral migration within the bedrock aquifer to receiving surface waterbodies.
- Discharge of water (groundwater / surface water runoff) to sewer, watercourses or groundwater in accordance with all statutory requirements and obligations.

The potential water receptors for the site include:

- Underlying bedrock aquifer which is part of the Ballinhassig East GWB.
- The closest EPA mapped (EPA, 2025) surface waterbodies to the site are the Healy's Bridge Stream (WFD Name: Owenboy (Cork)_040), the West Carrigaline River (WFD Name: Owenboy (Cork)_040), the Kilnaglery 19 Stream (WFD Name: Kilnaglery_010) and downstream waterbodies including the Owenboy Estuary transitional waterbody and the Cork Harbour coastal waterbody.
- The GSI wells and springs database (GSI, 2025) has identified one (1No.) downgradient supply (agricultural and domestic use) located at a residential property to the north of Mountain Road and adjacent to the northwest corner of the site and located with a potential hydrogeological connection to the site. There is no perceived pathway from groundwater beneath the site to other groundwater users identified within a 2km radius of the site and therefore these receptors are not considered further.
- There is an identified hydraulic connection to the Cork Harbour SPA and Owenboy River pNHA via groundwater discharges to receiving surface water bodies and via discharges to Cork Harbour from the Ringaskiddy WWTP. There are also five (5No.) other pNHAs identified with a potential indirect hydraulic connection to the site and Proposed Development via Cork Harbour (refer to Table 10-9). It is noted that the Natura 2000 sites and other protected and designated sites or areas are assessed in Chapter 11 of this EIAR.

During excavation, there is a risk to the underlying bedrock aquifer due to any accidental release of deleterious materials (e.g., fuels or other hazardous materials being used onsite), through the failure of secondary containment or a materials handling accident at the site, to exposed granular subsoils or bedrock creating a direct pathway to the underlying bedrock aquifer. The groundwater vulnerability will temporarily be increased during the demolition and construction phase. In a worst-case scenario, and in the absence of mitigation, it is considered that this could result in a 'negative' 'moderate to significant' and 'long term' impact on a local area of the underlying aquifer environment and the receiving Healy's Bridge Stream, the West Carrigaline River, the Kilnaglery 19 Stream and downstream waterbodies depending on the nature of the incident.

There is a potential risk associated with the cementitious materials used during construction works including construction of foundations, pavements and other structures impacting on the underlying groundwater at the Proposed Development site. Overall, the use of cementitious material at the Proposed Development site may result in a 'negative', 'moderate to significant' and 'medium-term' impact on the receiving water environment at the Proposed Development.

There is a potential risk of contaminants which enter the groundwater to flow laterally towards the receiving water supply located at the residential property to the north of Mountain Road (refer to Figure 10-8). In a worst-case scenario, and the absence of mitigation, it is considered that this could result in a 'negative' 'moderate to significant' and 'long term' impact on the receiving water supply and drinking water users depending on the nature of the incident.

Surface runoff entrained with sediment is unlikely to result in an impact on the receiving water courses as there is no direct connection for the demolition and construction phase based on the existing site condition. However, the release of suspended solids entrained in surface runoff indirectly tracked on vehicles to haul routes to / from site within a short distance of the site (e.g. Mountain Road) could enter the existing surface water drainage. The appointed contractor will ensure that any run-off from the site will be managed for the duration of the demolition and construction phase to ensure that surface water runoff is contained, attenuated and treated onsite prior to discharge to surface water / groundwater. However, in the absence of mitigation measures, this could potentially result in a 'negative', 'slight to moderate' 'short-term' impact on receiving water quality (i.e., the West Carrigaline River and downstream waterbodies).

The appointed contractor will ensure that any run-off from the subject site or any areas of exposed soil will be managed as required with temporary pumping. Where dewatering of excavations is required or where water must be pumped from the excavations, water will be discharged by the appointed contractor, following appropriate treatment (e.g., settlement

or hydrocarbon interceptor), to sewer, watercourses or groundwater in accordance with the necessary discharge licenses issued by the UE under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from Cork County Council under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water / groundwater. There will be no unauthorised discharge of water (groundwater / surface water runoff) to sewer, watercourses or groundwater during the demolition and construction phase of the Proposed Development. Therefore, the potential impacts will have been adequately assessed and mitigated as part of the statutory consent and there will be 'neutral', 'imperceptible' and 'temporary' impact on the receiving water environment.

The release of foul water during connection to the live sewers could result in a release of contaminants to ground or as overland runoff. Due to the temporary and phased nature of the demolition and construction phase of the Proposed Development, in the absence of mitigation the potential impact from an accidental spillage is considered to be 'negative', 'moderate' and 'short-term'.

Foul water discharge from the temporary welfare units at the site during the demolition and construction phase will be either tankered offsite in accordance with waste management legislation or discharged under temporary consent to the UE mains foul network for treatment at Ringaskiddy WWTP subject to agreement with UE. It is considered that any impact on the related foul during the demolition and construction phase will be 'neutral', 'imperceptible' and 'temporary'.

10.8.2.1 Operational Phase

During the operational phase of the Proposed Development, there is limited potential for any adverse impact on the receiving water (hydrological and hydrogeological) environment at the site taking account of the design for the Proposed Development.

10.8.2.1 Hydrogeological and Hydrological Flow Regime

There will be no groundwater or surface water abstractions during the operational phase of the Proposed Development.

The site currently comprises undeveloped lands. The construction of the Proposed Development will convert a percentage of the surface to impermeable surface due to the construction of buildings, roads and other infrastructure. Based on the findings of previous site investigations, the firm to stiff glacial deposits with fines content >50% is expected to have poor drainage and infiltration properties (PGL, 2024). Therefore, the existing capacity for infiltration and recharge to the aquifer is low. The change in cover from undeveloped land to paved areas within the Proposed Development will result in an unavoidable reduced infiltration potential within a localised portion of the 1,762m² Ballinhassig East GWB. The incorporation of the SuDS elements within the surface water drainage network will encourage continued groundwater recharge and any change in recharge potential will only impact a very localised area of the aquifer within the vicinity of the site. Therefore, it is considered that there will be an unavoidable 'negative', 'slight to moderate' and 'permanent' impact on the hydrogeological regime within a very localised zone of the locally important aquifer (LI).

Furthermore, groundwater flow in the northeast portion of the site likely flows to the west and north towards the Healy's Bridge Stream and West Carrigaline River, while groundwater in the southeast portion of the site likely flows to the east / southeast towards the Kilnaglery 19 Stream. While the change in cover from undeveloped land to paved areas within the Proposed Development will result in an unavoidable reduction in infiltration potential to the underlying aquifer, as mentioned above, all surface water from the Proposed Development will be treated and attenuated in accordance with the principles and objectives of SuDS. This will encourage continued groundwater recharge and also ensure that any intercepted surface water will ultimately discharge to the West Carrigaline River and downstream waterbodies. Therefore, it is considered that there will be a 'neutral', 'imperceptible', and 'long-term' impact on the hydrological regime of the receiving West Carrigaline River and downstream waterbodies.

10.8.2.2 Drainage and Flood Risk

As outlined in the Infrastructure Report (OSL, 2025d submitted with the planning application) the surface water drainage for the Proposed Development has been designed in accordance with SuDS and satisfies the requirements of the GSDS to meet the following design criteria:

- Criterion 1 – River Water Quality Protection.
- Criterion 2 – River Regime Protection.
- Criterion 3 – Level of Service (Flooding) / Flood Risk Assessment.
- Criterion 4 – River Flood Protection.

The SSFRA (OSL, 2025a) identifies that the site is located within Flood Zone C where the probability of flooding is low. The SSFRA (OSL, 2025a) concludes that the Proposed Development is appropriate for the site.

Therefore, it is considered that the potential flooding impacts associated with the Proposed Development are ‘neutral’, ‘imperceptible’ and ‘long-term’.

10.8.2.3 Water Quality

There will be no significant sources of contamination at the site during the operational phase of the Proposed Development.

There will be no requirement for bulk storage of petroleum hydrocarbons-based fuels during the operational phase as the main operating systems for heating will include air-source heat pumps. Further details are provided in Chapter 7 of this EIAR.

There will be no discharges to ground other than rainfall to unpaved landscaped areas and via limited recharge from SuDS measures incorporated into the surface water drainage network for the Proposed Development. As documented in the Infrastructure Report (OSL, 2025d) prior to discharging to the existing 300mm diameter surface water pipe located to the north of the site and ultimately to the West Carrigaline River, all surface water runoff will be treated and attenuated in accordance with the principals and objectives of SuDS as detailed in 10.3.1.2 (i.e., Petrol Interceptors, Swales, Bioretention Raingardens, SuDS Tree Pits, Permeable Pavers, Cellular Attenuation Systems and Attenuation Basins). Therefore, it is considered that there will be a ‘neutral’, ‘imperceptible’ and ‘long-term’ impact on the quality of receiving hydrological receptors including the West Carrigaline River. However, in the worst-case scenario of accidental spillage from a vehicle engine and failure of SuDS, there is a potential risk to water quality in the receiving environment. In the absence of design avoidance measures, there is a potential ‘negative’, ‘moderate’ and ‘long-term’ impact on the quality of the receiving water environment depending on the nature of the incident.

There is also a potential risk of contaminants that enter the groundwater to flow laterally towards the receiving water supply located at the residential property to the north of Mountain Road (refer to Figure 10-8). In the absence of design avoidance measures, there is a potential ‘negative’ ‘moderate to significant’ and ‘long term’ impact on the receiving water supply and drinking water users depending on the nature of the incident.

As outlined in the Infrastructure Report (OSL, 2025d), foul water from the Proposed Development will be treated in the Ringaskiddy WWTP (EPA Licence No. D0057-01) before ultimately discharging to Cork Harbour coastal waterbody, in accordance with the requirements from the UE CoF letter (UE COF Reference: CDS 24001434) and other applicable statutory consents verifying capacity at the Ringaskiddy WWTP for the Proposed Development. The Ringaskiddy WWTP is operated under existing statutory consents. Therefore, there will be adequate capacity within the Ringaskiddy WWTP

to accept foul effluent from the Proposed Development and the discharge of treated effluent from the Proposed Development will have a ‘neutral’, ‘imperceptible’, ‘long-term’ impact on receiving water quality and WFD status of the Cork Harbour coastal waterbody.

Furthermore, the foul drainage for the Proposed Development has been designed in accordance with the principles and methods set out in UE’s Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03) thereby, preventing any potential leakage of foul effluent to ground and risk of infiltration into the underlying groundwater and bedrock aquifer.

10.8.3 Cumulative Effects

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 1 of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Development.

10.8.3.1 Water Resources

As outlined in the Infrastructure Report (OSL, 2025d), water supply to the Proposed Development will be from the existing water main in the R611 (Kilmoney Lower Road) subject to agreement with UE. The UE COF (UE COF Reference: CDS 24001434) states that the water supply connection is feasible.

The mains water supply will be operated in accordance with relevant existing statutory consents. Therefore, there will be no cumulative impacts associated with the Proposed Development on the supply network and water resources.

10.8.3.2 Water Quality

As outlined in the Infrastructure Report (OSL, 2025d), surface water from the Proposed Development will be discharged to the existing 300mm diameter surface water pipe located to the north of the site and ultimately the West Carrigaline River. Surface water from the Proposed Development, which will be managed in accordance with the principles and objectives of SuDS and the GSDS, will be treated and attenuated through petrol interceptors and detention basins before discharging offsite at greenfield runoff rates. Therefore, there will be no cumulative impacts on the receiving surface water environment in terms of water quality and flood risk associated with the discharge of surface water runoff from the Proposed Development and considered offsite developments.

Foul water from the Proposed Development will be treated at the Ringaskiddy WWTP (EPA Licence No. D0057-01) before ultimately discharging to the West Carrigaline River, in accordance with the requirements from the UE CoF letter (UE COF Reference: CDS 24001434) and other applicable statutory consents verifying capacity at the Ringaskiddy WWTP for the Proposed Development. The Ringaskiddy WWTP is operated under existing statutory consents. Therefore, the discharge of treated effluent from the Proposed Development will have no cumulative impacts individually or in-combination on the Ringaskiddy WWTP or on the receiving water quality and WFD status.

There are no other potential cumulative impacts associated with the Proposed Development.

10.8.4 Summary

Table 10-10 summarises the identified likely significant effects during the demolition and construction phase of the Proposed Development before mitigation measures are applied.

Table 10-10 Summary of Demolition and Construction Phase Likely Significant Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Accidental Release of Deleterious Materials	Negative	Moderate to Significant	Local	Worst-case	Long-term	Direct
Use of Cementitious Materials	Negative	Moderate to Significant	Local	Possible	Medium-term	Direct
Existing Offsite Groundwater Supply	Negative	Moderate to Significant	Local	Worst-case	Long-term	Direct
Release of Suspended Solids Entrained in Surface Runoff	Negative	Slight to Moderate	Regional	Possible	Short-term	Direct
Localised Dewatering or Sump Pumping	Neutral	Imperceptible	Regional	Likely	Temporary	In-direct
Release of Foul Water During Connection to Live Sewers	Negative	Moderate	Local	Possible	Short-term	Direct
Discharge of Treated Effluent to UE Mains Sewer	Neutral	Imperceptible	Regional	Likely	Temporary	In-direct

Table 10-11 the identified likely significant effects during the operational phase of the Proposed Development before mitigation measures are applied.

Table 10-11 Summary of Operational Phase Likely Significant Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Reduction in Infiltration and Recharge to the Aquifer	Negative	Slight to Moderate	Local	Likely	Permanent	Direct
Reduced Potential for Discharge of Groundwater to Receiving Surface Waterbodies through Reduction in Infiltration	Neutral	Imperceptible	Local	Likely	Long-term	In-direct
Flooding	Neutral	Imperceptible	Local	Likely	Long-term	Direct
Management of Surface Water Runoff in Accordance with SuDS	Neutral	Imperceptible	Local	Likely	Long-term	Direct / Cumulative
Failure of SuDS	Negative	Moderate	Regional	Possible	Long-term	Direct / Worst-case

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Failure of SuDS and Impact on Existing Offsite Groundwater Supply	Negative	Moderate to Significant	Local	Possible	Long-term	Direct / Worst-case
Discharge of Treated Effluent	Neutral	Imperceptible	Regional	Likely	Long-term	In-direct / Cumulative
Mains Water Supply	Neutral	Imperceptible	Regional	Likely	Long-term	Cumulative

10.9 Mitigation Measures

10.9.1 Demolition and Construction Phase Mitigation

During the demolition and construction phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP) (OSL, 2025b). 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 / CEMP will be implemented for the duration of the demolition and construction phase, covering demolition, construction and waste management activities that will take place during the demolition and construction phase of the Proposed Development.

Mitigation works will be adopted as part of the demolition and construction works for the Proposed Development. These measures will address the main activities of potential impact which include:

- Control and Management of surface water runoff.
- Control and management of shallow groundwater during excavation and dewatering.
- Management and control of soil and materials.
- Appropriate fuel and chemical handling, transport and storage.
- Management of accidental release of contaminants at the site.
- Control and handling of cementitious materials.

The demolition and construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice. Good construction management practices will minimise the risk of pollution from construction activities at the subject site including but not limited to:

- Construction Industry Research and Information Association (CIRIA), 2001. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- CIRIA, 2015. Environmental Good Practice on Site (C741).
- Enterprise Ireland Oil Storage Guidelines (BPGCS005).
- Environmental Protection Agency (EPA), 2013. IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities.
- CIRIA, 2007. The SuDS Manual (C697).
- UK Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG).
- CIRIA, 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648).
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.

Control and Management of Water and Surface Runoff

There will be no direct discharge to groundwater or surface water during the demolition and construction phase of the Proposed Development.

All run-off from the site or any areas of exposed soil will be managed as required with temporary pumping and following appropriate treatment as required. Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to onsite settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge at a controlled rate. It is noted that, where required, surface water runoff will be prevented from entering open excavations with sandbags or other approved methods proposed by the appointed contractor.

The cleaning of public roads in and around the subject site will be undertaken to reduce environmental impacts and care will be taken to prevent any pollution of watercourses. The use of wheel-wash and water treatment facilities will be used as required onsite. The correct use and management of these will be undertaken by the appointed contractor to ensure that there is no harm to the receiving water environment.

As documented in the OCEMP (OSL, 2025b), surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary positive drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction. A series of geotextile lined cascading, high level outfall, settling basins will be installed upstream of the agreed discharge point by the appointed contractor. Alternatively, a 'siltbuster' silt control unit can be used on the outfall. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed before water is discharged in a controlled manner to the agreed outfall. All inlets to the cascading settling basins will be ripped to prevent scour and erosion in the vicinity of the inlet. Where required, the water will also be directed through a hydrocarbon interceptor prior to discharge from the site. There will be:

- Minimisation of site disturbance.
- Implementation of sediment control (as outlined above).
- Minimisation of the potential for erosion.
- Prevention of sediment-contaminated water leaving the site.

Such measures will be undertaken in accordance with the necessary discharge licenses issued by UE.

Protective measures such as temporary silt fencing and berms, will be installed prior to the commencement of construction to ensure the protection of the onsite drainage ditches. A buffer zone of 10m will be maintained on either side of the onsite drainage ditches.

All protective measures will be monitored to ensure that they remain functional throughout construction of the Proposed Development. Where necessary, maintenance will be carried out on the silt fencing, berms and settlement ponds to ensure that they continue to be effective. This will be particularly important after heavy rainfall events. The frequency of monitoring will depend on the stage of works, and local environmental conditions.

Where dewatering of shallow groundwater is required or where surface water runoff must be pumped from the excavations, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the OCEMP (OSL, 2025b) and regulatory consents including the necessary discharge licences issued by UE to minimise the potential impact on the

local groundwater flow regime of the underlying aquifer. Unauthorised discharge of water (groundwater / surface water runoff) to ground, drains or watercourses will not be permitted. Existing surface water drainage located along public roads (i.e., along Mountain Road) will be protected for the duration of the works.

Where required, stockpiles of loose materials pending re-use onsite will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains. To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff. Where required, silt fences will be erected at the toe of stockpiles to prevent run-off. The silt fences will be monitored daily by the appointed contractor and silt will be removed as required.

A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible.

Concrete Works

The use of cementitious grout used during the demolition and construction phase of the Proposed Development will avoid any contamination of the receiving hydrogeological environment through the use of appropriate design and methods implemented by the appointed contractor and in accordance with the OCEMP (OSL, 2025b) and relevant industry standards to prevent impact on groundwater and surface water quality such as the use of water compatible grout.

All ready-mixed concrete will be delivered to the site by truck. Concrete batching will take place offsite, wash out of concrete trucks will take place offsite (at authorised concrete batching plant in full compliance with relevant planning and environmental consents), with the exception of cleaning the chute into a container which will then be emptied into a container located within a controlled bunded area which will then be emptied into a skip for appropriate compliant removal offsite in accordance with all relevant waste management legislation. The containers must be checked and emptied at a frequency equivalent to the volume of concrete being used and no runoff should leave the washout location. A minimum buffer of 50m will be maintained between the designated wash down area sensitive receptors including drains and drainage ditches. Any excess concrete is not to be disposed of onsite.

Wet concrete works in proximity to the onsite drainage ditches will be avoided as much as practicable. Pouring of cement-based materials for works will only be carried out in dry conditions and pumped concrete will be monitored to ensure there is no accidental discharge.

A suitable risk assessment for wet concreting shall 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 CEMP, in a designated area of the site away from any watercourses and onsite drainage ditches (where not possible to carry out such activities onsite).

Any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas. These areas will be bunded (e.g. placed on 150mm concrete slab with the perimeter constructed with 225mm solid blockwork rendered internally) and located away from surface water drainage and features. Bunds will have regard to 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.

The main 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.

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

There may also be the requirement for use of portable generators or similar fuel containing equipment during the demolition and 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.

Emergency Procedures

Emergency procedures will be developed by the appointed contractor in advance of works commencing and spillage kits will be available onsite including in vehicles operating onsite. Construction staff will be familiar with emergency procedures 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.
- 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 onsite will be fully trained on the use of equipment.

Infrastructure

All below ground drainage infrastructure will be constructed in accordance with the measures outlined in the OCEMP (OSL, 2025b) and current UE requirements to ensure that there are no potential impacts to receiving water quality.

In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with the relevant standards, pressure tested, and CCTV surveyed to ascertain any possible defects.

All constructed manholes will need to be securely covered, and gullies fitted with a geotextile filter to allow protection of the surface water within the pipe.

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 demolition and construction phase of the Proposed Development will either be discharged to temporary holding tank(s), the contents of which will periodically be tankered off site to a licensed facility or discharged to public sewer in accordance with the necessary temporary discharge licences issued by UE. The Ringaskiddy WWTP is operated in accordance with relevant statutory approvals issued by UE. The increase discharge to the Ringaskiddy WWTP as a result of the Proposed Development is considered to be insignificant in terms of the overall scale of the facility. The increased load does not have the capacity to alter the effluent released from the WWTP to such an extent to result in likely significant effects on its receiving waters. Therefore, there will be no potential impact at any Natura 2000 sites associated with discharges from the site.

10.9.2 Operational Phase Mitigation

There will be no risk to water quality including groundwater and surface water associated with the operational phase of the Proposed Development. It is considered that the design of the Proposed Development is in line with the objectives of the Water Framework Directive (2000/60/EC), as amended (WFD) to prevent or limit any potential impact on water quality.

There will be no petroleum hydrocarbon-based fuels used during the operational phase and the main operating system for heating will be gas based / air to water heat pump, thereby removing any potential contaminant sources associated with fuels.

All drainage from paved areas along roads and impermeable roads will be collected and managed within the surface water drainage and SuDS solutions as outlined in the Infrastructure Report (OSL, 2025d).

The surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals, and suspended sediments) in surface water runoff from the higher risk areas including roads and the impermeable areas that could potentially otherwise discharge to groundwater or receiving water courses in the vicinity the site. The measures incorporated in the SuDS design include Petrol Interceptors, Swales, Bioretention Raingardens, SuDS Tree Pits, Permeable Pavers, Cellular Attenuation Systems and Attenuation Basins within the drainage and SuDS system. The measures incorporated will be effective in the treatment and removal of any contaminants (metals, polycyclic aromatic hydrocarbons (PAHs) and suspended solids) entrained in surface water runoff. The effectiveness of these SuDS measures is documented in TII guidance (TII, 2014). Furthermore, prior to discharging from the site, it will pass through a class 1 petrol interceptor that will be effective in removal of hydrocarbons that may enter the drainage system in particular in the event of worst-case scenario spill incident (e.g., collision on the roadway resulting in the loss of fuel from a vehicle).

Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development. This will ensure that there are no impacts on water quality and quantity (flow regime) during the operational phase of the Proposed Development.

Foul water during the operational phase of the Proposed Development will ultimately discharge via the Ringaskiddy WWTP to Cork Harbour under the appropriate consents from UE. As mentioned above, the Ringaskiddy WWTP is operated in accordance with relevant statutory approvals issued by UE. Foul water from the site will only be discharged to the UE network under the appropriate consents from UE, and therefore, the proposed development will not cause a potential impact at any Natura 2000 sites associated with discharges from the site.

Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development site will be avoided taking account of the design proposals. Therefore, it is considered that the water quality protection criteria and objectives of the GDSDS and WFD will be achieved.

There is no other requirement for mitigation measures for the operational phase of the Proposed Development.

10.10 Water Framework Directive

The findings of the risk-based assessment identified that in the absence of any mitigation and avoidance measures there could be a potential impact on the water quality within receiving water bodies associated with and potentially hydraulically connected to the Proposed Development, specifically within the Ballinhassig East GWB, the Owenboy (Cork)_040 and Kilnaglery_010 river waterbodies, and the Cork harbour coastal waterbody (via the Ringaskiddy WWTP). However, there is no identified potential impact to the Owenboy Estuary transitional waterbody or other potentially hydraulically connected waterbodies attributed to the separation distances and anticipated assimilation capacity of the receiving water bodies taking account the existing baseline conditions and WFD Status.

The design avoidance and mitigation measures as outlined in Section 10.9 above, including the implementation of a robust CEMP during the demolition and construction phase and the incorporation of SuDS in the design of the Proposed Development, will prevent any impact and deterioration to the existing WFD status of groundwater and surface waterbodies hydraulically connected to the site and Proposed Development (i.e., the Ballinhassig East GWB, the Owenboy (Cork)_040 and Kilnaglery_010 river waterbodies, the Owenboy Estuary transitional waterbody and the Cork harbour coastal waterbody). Hence, the Proposed Development will not have any impact on compliance with the EU Water Framework Directive, European Communities (Environmental Objectives) Surface Water Regulations, 2009 (SI 272 of 2009) as amended and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended. Furthermore, there will be no impact to the existing WFD status of associated waterbodies, the Proposed Development will not jeopardise the objective of achieving 'good' groundwater and surface water status or good ecological potential.

10.11 Residual Impact Assessment

Residual Impacts are defined as 'effects that are predicted to remain after all assessments 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.

10.11.1 Demolition and Construction Phase

The predicted impacts of the demolition and construction phase of the Proposed Development are described in Table 10-12 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.

There are no significant residual impacts on the receiving water environment (hydrology and hydrogeology) anticipated regarding this Proposed Development.

Table 10-12. Residual Impacts (Demolition and Construction phase)

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Demolition and construction phase								
Potential Uncontrolled Release of Hazardous Materials Including Fuels, Oils and Other Materials	Groundwater and Receiving Surface Water Quality and WFD status	Potential (albeit low) for uncontrolled release of deleterious materials including fuels and other materials being used onsite, through the failure of secondary and tertiary containment or materials handling accident, to the receiving groundwater environment.	Negative	Moderate to Significant	Long-term	Direct	Refuelling 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
Use of Cementitious Materials.	Groundwater and Receiving Surface Water Quality and WFD status	Potential release of cementitious material during the construction of foundations, pavements, and other structures.	Negative	Moderate to Significant	Medium Term	Direct	The use of cementitious grout will be undertaken by the appointed contractor in accordance with the CEMP and relevant industry standards.	Imperceptible
Existing Offsite Groundwater Supply	Receiving Water Supply and Drinking Water Users	In a worst-case scenario, there is a potential risk of contaminants which enter the groundwater to flow laterally towards the receiving water supply.	Negative	Moderate to Significant	Long-term	Direct	All works will be undertaken in accordance with the CEMP to prevent any potential emissions to ground and surface water.	Imperceptible
Release of Suspended Solids Entrained in Surface Runoff	Surface Water Quality and WFD status	The release of suspended solids entrained in surface runoff indirectly tracked on vehicles to haul routes to / from site within a short distance of the site (e.g. Mountain Road) could enter the existing surface water drainage.	Negative	Slight to Moderate	Short-term	Direct	Existing surface water drainage located along public roads (i.e., along Mountain Road) will be protected for the duration of the works. Furthermore, surface water runoff within the site will be contained, attenuated and treated onsite prior to discharge to surface water / groundwater.	Imperceptible
Release of Foul Water During Connection to Live Sewers	Groundwater and Receiving Surface Water Quality and WFD status	The release of foul water during connection to the live sewers could result in a release of contaminants to ground or as overland runoff.	Negative	Moderate	Short-term	Direct	All below ground drainage infrastructure will be constructed in accordance with the measures outlined in the CEMP and current UE requirements.	Imperceptible

10.11.2 Operational Phase

The predicted impacts of the operational phase of the Proposed Development are described in Table 10-13 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 are no significant residual impacts on the receiving hydrology and hydrogeology anticipated regarding the operational phase of the Proposed Development.**Table 10-13. Residual Impacts (Operational Phase)**

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Demolition and construction phase								
Reduced Potential for Contaminant Migration through Reduction in Infiltration	Hydrogeological Regime	The change in cover from undeveloped land to paved areas within the Proposed Development will result in an unavoidable reduced infiltration potential within a localised portion of the Ballinhassig East GWB.	Negative	Slight to Moderate	Permanent	Direct	Unavoidable. The incorporation of the SuDS elements within the surface water drainage network will encourage continued groundwater recharge.	Slight to Moderate
Failure of SuDS	Receiving Surface Water Quality and WFD status	In the worst-case scenario of accidental spillage from a vehicle engine and failure of SuDS there is a potential risk to water quality in the receiving environment.	Negative	Moderate	Long-term	Direct / Worst-case	Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development.	Imperceptible / Positive
Failure of SuDS	Receiving Water Supply and Drinking Water Users	In the worst-case scenario of accidental spillage from a vehicle engine and failure of SuDS there is a potential risk of contaminants to enter the groundwater and flowing laterally towards the receiving water supply.	Negative	Moderate to Significant	Long-term	Direct / Worst-case	Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development.	Imperceptible

10.11.3 Summary of Post-mitigation Effects

Table 10-14 summarises the identified likely significant residual effects during the demolition and construction phase of the Proposed Development following the application of the mitigation measures.

Table 10-14 Summary of Demolition and Construction Phase Effects Post-Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Accidental Release of Deleterious Materials	Negative	Imperceptible	Local	Worst-case	Long-term	Direct
Use of Cementitious Materials	Negative	Imperceptible	Local	Possible	Medium-term	Direct
Existing Offsite Groundwater Supply	Negative	Imperceptible	Local	Worst-case	Long-term	Direct
Release of Suspended Solids Entrained in Surface Runoff	Negative	Imperceptible	Regional	Possible	Short-term	Direct
Release of Foul Water During Connection to Live Sewers	Negative	Imperceptible	Local	Possible	Short-term	Direct

Table 10-15 summarises the identified likely residual significant effects during the operational phase of the Proposed Development post-mitigation.

Table 10-15 Summary of Operational Phase Effects Post-Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Reduction in Infiltration and Recharge to the Aquifer	Slight to Moderate	Slight to Moderate	Local	Likely	Permanent	Direct
Failure of SuDS	Imperceptible / Positive	Moderate	Regional	Possible	Long-term	Direct / Worst-case
Failure of SuDS and Impact to Existing Offsite Groundwater Supply	Imperceptible	Moderate to Significant	Local	Possible	Long-term	Direct / Worst-case

10.12 Risk of Major Accidents or Disasters

There is no identified risk of flooding at the site of the Proposed Development.

There are no karst features recorded within the site boundary.

10.13 Worst Case Scenario

During the demolition and construction phase and / or operational phase of the Proposed Development, in a 'Worst Case' scenario there is a potential risk of accidental releases of petroleum hydrocarbons (e.g., a fuel spill) and of untreated water via failure or rupture of the drainage system that could migrate to groundwater or surface water and impact on the quality of the receiving waterbodies and downstream receptors depending on the nature of the incident. It is considered that the potential risk of those releases will present a 'negative', 'moderate to significant' and 'long-term' impact on the receiving environment. However, taking account of standard management practices and mitigation measures any environmental harm can be avoided and it is considered that there would be a 'neutral', 'imperceptible' and 'short-term' impact on the receiving environment.

10.14 Interactions

10.14.1 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. Pollution events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water control measures will be implemented as part of the Proposed Development.

Appropriate industry standard and health and safety legislative requirements will be implemented during the demolition and construction phase of the Proposed Development that will be protective of site workers.

The Proposed Development will increase the amount of people in close proximity to flood-prone areas. This increased population density could heighten the potential for flood-related health impacts, particularly during construction. Residual risk will be mitigated by monitoring weather forecasts to optimize construction planning.

10.14.2 Land, Soil and Geology

An assessment of the potential impact of the Proposed Development on the land and soils is included in Chapter 9 of this EIAR. During the demolition and construction phase (i.e., earthworks), heavy rainfall events have the potential to mobilise contaminated run-off and impact on the usability of materials stored onsite. This could therefore require the importation of additional material from external sources. Mitigation measures to reduce the risk of damage to construction materials from heavy rainfall and flood events are outlined in Chapter 9.

10.14.3 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 11 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.

10.14.4 Material Assets: Built Services

An assessment of the potential impact of the Proposed Development on the material assets - waste and utilities including built services and infrastructure has been set out in Chapter 7 of this EIAR.

There is a risk of excess silts from construction runoff accumulating in the existing drainage network, potentially compromising its capacity. To mitigate this, standard pollution control measures will be employed to manage contaminated runoff and preserve the integrity of drainage channels during construction.

10.15 Monitoring

10.15.1 Demolition and Construction Phase

During the demolition and construction phase of the Proposed Development, the following monitoring measures will be considered:

- Inspections will be undertaken during excavations and other groundworks to ensure that measures are protective of water quality outlined in this EIAR and the OCEMP (OSL, 2025b) are fully implemented and effective.
- Discharges to surface water / foul sewers will be monitored where required in accordance with statutory consents (i.e., discharge license). Where required, water pumped from excavations will be treated and pumped to a holding area, where it will be sampled and tested by the contractor before discharge. Upon receiving analysis results and screening against required consent limits, the contractor will arrange for appropriate disposal. Groundwater will be treated and discharged to the foul sewer in accordance with the temporary discharge consent.
- It is proposed to implement a programme for monitoring water quality at the outfall as part of the construction of this development, in agreement with the Planning Authority.
- Monitoring prior to, during and post construction works of surface water quality shall be undertaken to ensure minimum disturbance of water quality in the receiving environment.
- During the demolition and construction phase, the monitoring programme will include daily checks, weekly inspections and monthly audits. This programme and locations of sampling will be agreed with the local authority prior to the commencement of the Proposed Development.
- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with avoidance, remedial and mitigation measures.

10.15.2 Operational Phase

Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be undertaken throughout the lifetime of the operational phase of the Proposed Development.

10.16 Conclusion

Overall, taking account of the design avoidance and mitigation measures, there are no significant residual impacts on hydrology and hydrogeology anticipated regarding the demolition and construction phase and operational phase of the Proposed Development.

10.17 References and Sources

Construction Industry Research and Information Association (2015) Environmental good practice on Site guide (CIRIA -C741).

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

Cork County Council, 2022. Cork County Development Plan 2022-2028.

Department of the Environment, Heritage and Local Government, 2009. Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities (DEHLG, 2009).

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

Environmental Protection Agency, 2025. EPA Envision Maps. <https://gis.epa.ie/EPAMaps/>. Consulted on 08/01/2025.

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, 2025. GSI web mapping. <https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228>. Consulted on 08/01/2025.

Google Earth Pro, 2025. Consulted on 08/01/2025.

IMEA, 2022. A New Perspective on Land and Soil in Environmental Impact Assessment.

Institute of Geologists of Ireland Guidelines, 2002. Geology in Environmental Impact Statements, A Guide.

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.

OSL Butler Consulting Engineers, 2025. Site-Specific Flood Risk Assessment.

OSL Butler Consulting Engineers, 2025. Outline Construction Environmental Management Plan.

OSL Butler Consulting Engineers, 2025. Outline Resource and Waste Management Plan.

Priority Geotechnical Ltd., 2024. Mountain Rd. Housing Development, Carrigaline, Desk Study and Geotechnical Review.

Uisce Éireann, 2023. Ringaskiddy - D0057-01 Annual Environmental Report 2022.

CHAPTER ELEVEN

BIODIVERSITY



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER ELEVEN

Table of Contents

Biodiversity

11.1 Introduction..... 11-1

11.2 Description of the Proposed Development 11-2

11.3 Methodology 11-6

11.4 Zone of Influence..... 11-6

11.5 Identification of Relevant Designated Sites..... 11-6

11.6 Field Surveys..... 11-7

11.7 Ecological Assessment..... 11-9

11.8 Limitations 11-10

11.9 Ecological Baseline Conditions 11-11

11.10 Ecological Impact Assessment..... 11-29

11.11 Avoidance, Mitigation, Compensation and Enhancement Measures 11-32

11.12 Monitoring 11-35

11.13 Residual Impact Assessment 11-36

11.14 Interactions 11-36

11.16 References and Sources 11-36

Table of Tables

Figure 11.2. Landscape Plan (SRLA, 2025).....	11-5
Table 11.1 Survey Effort with weather conditions during Breeding Bird Survey at the Proposed Development	11-9
Table 11.2. EPA Monitoring Stations and assigned Q Values.....	11-11
Table 11.3. WFD Risk and Water Body Status	11-11
Table 11.4. European Sites considered with the Source-Pathway-Receptor (S-P-R) method to establish notable links between the sources of effects arising from the Proposed Development, and any European Sites.....	11-12
Table 11.5. Showing a complete list of Designated Sites which have been considered with the Source-Pathway-Receptor (S-P-R) method to establish notable links between the source of effects arising from the Proposed Development, and any relevant Designated Sites.	11-13
Table 11.6. Invasive species records (NBDC Database) from the W76 10km grid square encompassing the Site.....	11-19
Table 11.7. Records of terrestrial mammals (Native and Non-Native) for the surrounding 2km (W76A) Grid Square associated with the Site (NBDC)	11-20
Table 11.8. Records of bats for the surrounding 1km Grid squares (W7160 and W7161) which encompass the Site (NBDC)	11-22
Table 11.9. Records of bats for the surrounding 10km Grid square (W76) which encompasses the Site (NBDC).	11-22
Table 11.11 Dusk Transect Survey Effort.....	11-23
Table 11.12. Summary of bat activity recorded on Site – 12th of August 2024	11-23
Table 11.13. Summary of bat activity recorded on Site – 10th of September 2024.....	11-24

Table 11.14. Details of EU Annex I, BoCCI Amber and BoCCI Red-listed species recorded within the 2km grid square (W76A) (NBDC,2025)	11-25

Table 11.15. Breeding Bird Survey Results. Including results from Preliminary Ecological Appraisal Field Visit	11-26

Table 11.16. Evaluation of Designated Sites, Habitats, Flora and Fauna recorded within the Site and surrounding area. Those identified as Key Ecological Receptors (KERs) are highlighted in green.	11-27

Table 11.17. Embedded Design Features and their potential to act to avoid or mitigate negative impacts on the local ecology and environment.....	11-29

Table 11.18. Mitigation and enhancement measures during the construction and operational phase as well as enhancement measures to be carried out by a suitably qualified ecologist (represented in green).	11-36

Table of Figures

Figure 11.1 Site location.....	11-2
Figure 11.2. Landscape Plan (SRLA, 2025).....	11-5
Figure 11.3. Mountain Road Illuminance Report (Molloy, 2024).....	11-5
Figure 11.4. Badger Survey Areas Covered	11-7
Figure 11.5. Internationally designated sites in relation to the Proposed Development.....	11-14
Figure 11.6. Nationally designated sites in relation to the Proposed Development.....	11-14
Figure 11.7. Wet alder-ash-woodland (ED2)	11-15
Figure 11.8. Wet alder-ash-woodland (ED2)	11-16
Figure 11.9. Wet Grassland (GS4)	11-16
Figure 11.10. Hedgerows (WL1)	11-16
Figure 11.11. Scrub (WS1) (adjacent to Wet Grassland and Treeline) ..	11-17
Figure 11.12. Treeline (WL2)	11-17
Figure 11.13. Drainage Ditch (FW4)	11-17
Figure 11.14. Improved Agricultural Grassland.....	11-18
Figure 11.15. Aerial image of Buildings and Artificial Surfaces	11-18
Figure 11.16. Habitat map	11-19
Figure 11.17. Badger Sett on Site	11-21
Figure 11.18. Mammal Trail in proximity to the Badger Sett	11-21
Figure 11.19. Badger Sett Location.....	11-21
Figure 11.20. Bat Landscape Suitability Model (All bats) surrounding the Proposed Development Site (Adapted from NBDC).	11-22
Figure 11.21 Species composition on the 12th of August 2024.	11-23

Figure 11.22. Bat activity and transect route on the 12th of August 2024.	11-24
Figure 11.23. Species composition on the 10th of September 2024.....	11-24
Figure 11.24. Approximate transect route (shown in yellow) on the 10th of September 2024.	11-24
Figure 11.25. Breeding Bird Survey Observations	11-26
Figure 11.26. Badger Sett Buffer Zones	11-33
Figure 11.27. Examples of suitable Kestrel Nest Box design	11-35
Figure 11.28. Examples of suitable amphibian and reptile hibernacula and refugia.	11-35

CHAPTER ELEVEN | Biodiversity

11.1 Introduction

11.1.1 Overview and Aims

Enviroguide Consulting was commissioned by McCutcheon Halley, acting on behalf of Bridgewater Homes Ltd., to undertake an Ecological Impact Assessment (EclA), presented as a Biodiversity Chapter, in relation to a Proposed Development at the Mountain Road, within the townland of Kilmoney, Carrigaline, Co. Cork, hereafter referred to as 'Proposed Development' or 'Site' when referring to the site area of the Proposed Development.

This Biodiversity Chapter assesses the potential effects of the Proposed Development on habitats and species; particularly those protected by national and international legislation or considered to be of nature conservation importance on or adjacent to the Site. This report will describe the ecology of the Site, with emphasis on habitats, flora and fauna, and will assess the potential effects of the Construction and Operational Phases of the Proposed Development on these ecological receptors. The report follows Guidelines for Ecological Impact Assessment in the UK and Ireland, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018) and supplemented by the National Roads Authority (2009) guidelines for Assessment of Ecological Impacts of National Road Schemes. The purpose of this Report is to:

- Set out the methodologies used to inform the assessment.
- Identify Key Ecological Receptors (KERs) within the Zone of Influence (ZOI).
- Assess the impacts from the Proposed Development on the KERs and the resulting significant effects.
- Set out measures to avoid or mitigate negative impacts.
- Assess the residual effects after the incorporation of agreed avoidance or mitigation measures to ensure legal compliance.
- Set out agreed measures to offset significant residual effects.
- Set out opportunities for ecological enhancement.

11.1.2 Quality Assurance and Competence

Enviroguide Consulting is a multi-disciplinary consultancy specialising in the areas of the Environment, Waste Management and Planning. All of our consultants carry scientific or engineering qualifications and have a wealth of experience working within the Environmental Consultancy sectors, having undergone extensive training and continued professional development.

Enviroguide Consulting as a company remains fully briefed in European and Irish environmental policy and legislation. Enviroguide staff members are highly qualified in their field. Professional memberships include the Chartered Institution of Wastes Management (CIWM), the Irish Environmental Law Association and Chartered Institute of Ecology and Environmental Management (CIEEM).

All surveying and reporting have been carried out by qualified and experienced ecologists and environmental consultants. Tom Ryan, Senior Ecologist and Ornithologist with Enviroguide, undertook the Breeding Bird Surveys, habitat, fauna and flora surveys and desktop research for this report. Brian McCloskey, Ornithologist and Ecologist with Enviroguide, undertook Breeding Bird Surveys and Bat Activity Surveys for this report. Kelly Macken and Charith Rakesh Kumar, Ecology

interns at Enviroguide at the time, assisted in carrying out the Bat Activity Surveys for this report. This chapter of the EIAR has been prepared by TR of Enviroguide Consulting.

TR holds a B.Sc. in Environmental and Natural Resource Management (Hons.) and a Post-Graduate Diploma in Environmental Management with GIS. TR is an experienced Ecologist who has specialised in ornithology and terrestrial mammals with over 8 years' experience in ecological consultancy along with a lifetime of personal interest and experience in wildlife management. TR has extensive experience in ecological surveying, desktop research, preparing AA Screening Reports (AA), Ecological Impact Assessment Reports (EclAs), Bird Activity Reports and detailed Species-Specific Mapping. His ability to deal with and understand a range of species, survey methods and habitats is excellent, having an in-depth knowledge and understanding of EU and Irish legislation. TR has carried out the preparation of the Biodiversity Chapter.

11.1.3 Relevant Legislation and Policy Context

An EclA is a process of identifying, quantifying, and evaluating potential effects of development-related or other actions on habitats, species and ecosystems (CIEEM, 2018). When an EclA is undertaken as part of an EIA process (in the form of an EIAR Biodiversity Chapter) it is subject to the EIA Regulations (under the Planning and Development Regulations 2001-2023). An EclA is not a statutory requirement, however it is a best practice evaluation process. The EclA detailed within this Biodiversity Chapter is provided to assist the Competent Authority with its decision making in respect of the Proposed Development.

There is a number of pieces of legislation, regulations and policies specific to ecology which underpin this assessment. These may be applicable at a European, National or Local level. Legislation at the International level relevant to the Proposed Development are listed below:

- Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora; hereafter the 'Habitats Directive'.
- Directive 2009/147/EEC, hereafter the 'Birds Directive'.
- Directive 2011/92/EU, hereafter the 'EIA Directive'.
- EU Regulation 1143/2014, on Invasive Alien Species.
- Convention on the Conservation of European Wildlife and Natural Habitats 1982, hereafter the 'Bern Convention'.
- The Convention on the Conservation of Migratory Species of Wild Animals 1983, hereafter the 'Bonn Convention'.
- Ramsar Convention on Wetlands 1971, hereafter referred to as 'Ramsar'.
- Water Framework Directive 2000/60/EC, hereafter the 'WFD'.

National legislation and policy relevant to the Proposed Development are listed below:

- Wildlife Act 1976, as amended in 2000.
- Flora (Protection) Order 2022.
- The Planning and Development Act 2000 (as amended)
- The Planning and Development Act 2024.
- National Biodiversity Plan 2023-2030.
- All-Ireland Pollinator Plan 2021-2025.

Additionally, Natural Heritage Areas (NHAs) are designations under the Wildlife Acts to protect habitats, species, or geology of national importance. The boundaries of many of the NHAs in Ireland overlap with Special Areas of Conservation (SAC) and/or Special Protection Area (SPA) sites. Although many NHA designations are not yet fully in force under this legislation (referred to as 'proposed NHAs' or pNHAs), they are offered protection in the meantime under planning policy which normally requires that planning authorities give recognition to their ecological value.

Local plans and policies relevant to the Proposed Development are listed below:

- Cork County Development Plan (2022-2028).
- Cork Biodiversity Action Plan (2014-2019).
- All Ireland Pollinator Plan (2021-2025).

Further details on legislation and policy relevant to the Proposed Development are detailed in Appendix 11.1.

11.2 Description of the Proposed Development

11.2.1 Proposed Development Description

The Proposed Development will include the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

The full description of the Proposed Development is outlined in Chapter 2 of this EIAR.

11.2.2 Site Location

The Proposed Development is located within existing farmland bordering Mountain Road to the north, and farmland to the south and west. The Site is located within the townland of Kilmoney within the outskirts and southwest settlement boundary of Carrigaline. The Site is within 2km of the centre of Carrigaline and is bound to the east by the existing Wheatfields residential estate.

The location of the Site is presented in Figure 11.1 below.

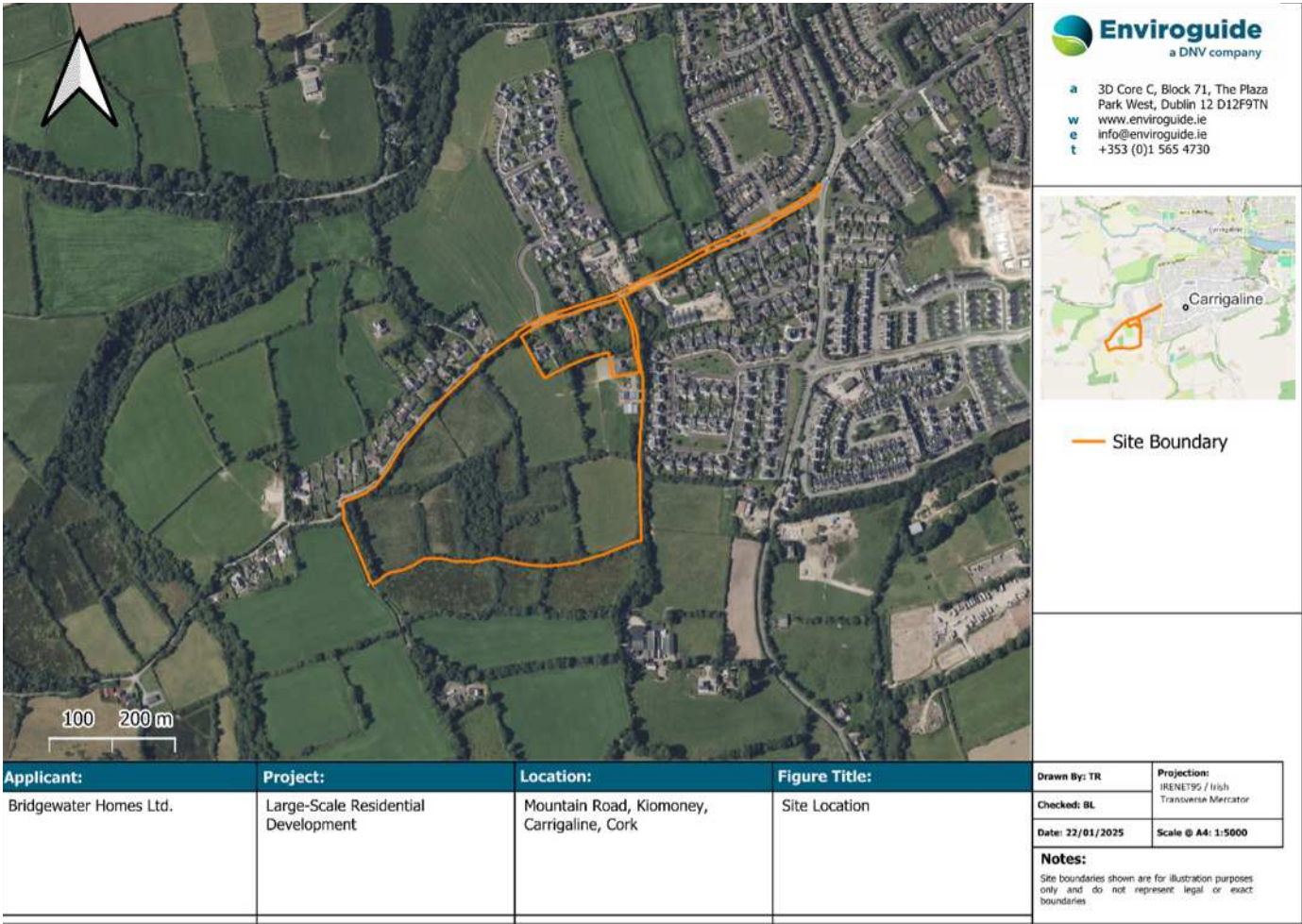


Figure 11.1 Site location

11.2.3 Description of the Demolition and Construction Phase

It is estimated that the project will commence in January 2026 with the construction phase lasting c. 60 months as outlined in the preliminary Construction Environmental Management Plan (CEMP) prepared by OSL Butler (2025a).

11.2.3.1 Construction Phase Order of Activities

It is proposed that the construction phase will have a number of phases of activities with dwelling units being developed on a sequential basis (OSL Butler, 2025a).

The demolition of the existing structures will take place before the Construction Phase commences.

The construction phase will include the following order of activities:

- Site Setup including welfare facilities, signage, compound, temporary foul and storm sewers and vegetation clearance.

- Storm and foul water service construction (estimated 36 months).
- Setting out of sites and Provision of Services.
- Construction of Residential Units.

11.2.3.2 Compound Facilities and Parking

- Clean permeable construction enclosed with security fencing.
- Designated staff and machinery parking.
- Way finding signage.
- Removal of waste material off Site to an approved handling facility.

11.2.3.3 Traffic Management

- Construction Traffic Management Plan (CTMP).
- Material Storage Zone.
- Dedicated Construction haulage routes.
- Road cleaning programme where required.

11.2.3.4 Resource and Waste Management Plan

- Waste arising from the site will be considered in relation to the waste management hierarchy of prevention, reduce, reuse, recycle, energy recovery and disposal.
- All waste will be sent to appropriately authorised facilities.

11.2.3.5 Sediment and Water Pollution Control Plan

Measures are set out in the CEMP to minimise the risk of contamination of watercourses/ groundwater, sediment and erosion, over ground spill and flows of petrochemicals, unlicensed discharges. Measures outlined are listed below;

- Concrete batching and segregated washdown off-Site
- 50m buffer from sensitive areas including drainage ditches
- Water abstraction from existing watercourses will not be permitted
- Implementation of sediment control
- Minimisation of potential for erosion
- Prevention of sediment contaminated water leaving the Site
- Water quality monitoring
- Overground oil and diesel storage
- Off-Site wastewater disposal
- Road cleaning
- Dewatering

11.2.3.6 Dust and Dirt Generation Control Measures

The CEMP states the following in relation to dust control measures. (OSL Butler, 2025a)

“The following measures will be implemented:

- *Apply a speed limit of at least 20km/hr for on-site vehicles*
- *Provide water bowsters during periods of dry weather to ensure unpaved areas are kept moist. Spray exposed site haul roads during dry and / or windy weather.*
- *Ensure paved roads are kept clean and free of mud and other materials. Sweep hard surface roads, inside and outside the site, to ensure roads are kept clear of debris, soil or other material.*
- *Restrict un-surfaced roads to essential site traffic.*
- *Provide water bowsters during periods of high winds and dry weather conditions to ensure moisture content is high to increase the stability of the soil.*
- *During the proposed works the following mitigation measures shall be implemented to minimise dust emissions:*
 - *Protect overburden material from exposure to wind by storing the material in sheltered regions of the site.*
 - *Regular watering of stockpiles during dry and windy periods.*
 - *Located any stockpiles away from sensitive receptors, (i.e. receptors sensitive to dust release).*
 - *Provide tarpaulins over all unacceptable excavated materials being carted off site.*
 - *Control vehicle speeds and impose speed restrictions, (speed can mobilise dust).*
 - *During dry spells and if deemed necessary monitoring of dust levels shall be carried out using the Bergerhoff Method i.e. analysis of dust collecting jars left on-site (German Standard VDI 2119, 1972). Results will be compared to the TA Luft guidelines (TA Luft, 1972). Should an exceedance of the TA Luft limit occur during, additional mitigation measures, for example more regular spraying of water shall be implemented.*
 - *The excavating machines will be cleaned on a daily basis to ensure no excess grease and dust is left on the machine. This will be carried out at low level below the height of the hoarding to prevent any mud coming in contact with the public.*

The Contractor will be required to produce an Air Quality and Dust Management Plan including Best Practice Measures to control dust and in particular, measures to prevent dust nuisance. The principal objective of the Air Quality and Dust Management Plan will be to ensure that dust emissions do not cause significant nuisance at receptors near the Proposed Project. A dust deposition monitoring programme will be implemented during the Construction Phase in order to verify the continued compliance with relevant standards and limits.”

11.2.3.7 Noise and Vibration

The Demolition and Construction Phase will involve the generation of noise through construction plant machinery and delivery of material to Site. The noise generated during the development phase will be minimised in accordance with standard guidelines and regulations as described in the preliminary CEMP (OSL Butler, 2025a).

“ During the construction of the works, the Contractor shall comply with:

- *BS 5228: 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites, Part 1 and Part 2.*
- *Guidelines for the Treatment of Noise and Vibration in National Road Schemes (NRS, Revision 1, 2004)*
- *Safety, Health and Welfare at Work (General Application) Regulations 2007, Part 5 Noise and Vibration*
- *The following acceptable levels (Table 1 below) are described in the Transport Infrastructure Ireland (TII) publication*

Good Practice Guidance for the Treatment of Noise during the Planning of National Road Schemes, March 2014. These limits are applied during the construction of road infrastructure projects at the facades of NSRs.”. Noise levels in accordance with TII, 2014 are to be adhered to during the Construction Phase and it is unlikely that there will be a requirement for nighttime or evening work (OSL Butler, 2025a).

Noise and Vibration levels are to be minimised through a range of ‘reductive/mitigation measures, as detailed in the CEMP (OSL Butler, 2025a).

11.2.4 Description of the Operational Phase

The Operational Phase will comprise residential use that is consistent with the neighbouring land use in the area and that of the neighbouring Wheatfield residential estate.

11.2.4.1 Drainage and Water Supply

11.2.4.1 Proposed Water Services

The Infrastructure Design Report accompanying this application under separate cover (OSL Butler 2025b) details the existing services and proposed water connection plan as below;

“A pre-connection enquiry was made to Uisce Éireann to confirm whether there is adequate capacity in the public network to accommodate the proposed Large-scale Residential Development (CDS 24001434). The existing water infrastructure has been deemed suitable, with upgrades. The upgrade works includes a 150mm diameter water main to be installed from the proposed development and connecting to the existing water main in the R611 (Kilmoney Lower Road) [...] All connections, valves, hydrants, meters etc. have been designed and are to be installed in accordance with Uisce Éireann ‘Standard Details for Water Infrastructure’, ‘Code of Practice for Water Infrastructure’ and the Department of the Environment’s Building Regulations “Technical Guidance Document B - Fire Safety (2020)”.

11.2.4.1.2 Foul Water Management

The Infrastructure Design Report accompanying this application under separate cover (OSL Butler 2025b) details the existing services and proposed water connection plan as below;

“There is an existing 225mm diameter foul line within Mountain Road, approximately 300m to the east of the proposed development entrance. This existing foul line services the lands adjacent to Mountain Road. This existing foul line connects to a 375mm diameter foul sewer located approximately 625m to the east of the site in Kilmoney Road (R611). These sewers drain north eastwards towards the pump station (Crosshaven Road WWPS Ringaskiddy) located at Carrigaline Main Road (adjacent to Carrigaline Library). The rising main from the aforementioned pump station discharges to an existing 525mm diameter foul line to the south.... The aforementioned upgrade works includes a 300mm diameter foul sewer to be installed from the proposed development and connecting to the existing foul sewer in the R611 (Kilmoney Lower Road).”

Foul water from the Proposed Development will discharge via the Ringaskiddy Wastewater Treatment Plant (WWTP) to the Cork Harbour coastal waterbody.

The AA Screening Report (Enviroguide, 2025) states ‘foul water from the Proposed Development will be treated in the Ringaskiddy WWTP (EPA Licence No. D0057-01) before ultimately discharging to Cork Harbour coastal waterbody, in accordance with the requirements from the UE CoF letter (UE COF Reference: CDS 24001434) and other applicable statutory consents verifying capacity at the Ringaskiddy WWTP for the Proposed Development. The Ringaskiddy WWTP is operated under existing statutory consents. Therefore, there will be adequate capacity within the Ringaskiddy WWTP to accept foul effluent from the Proposed Development and the discharge of treated effluent from the Proposed Development will have a ‘neutral’, ‘imperceptible’, ‘long-term’ impact on receiving water quality of the Cork Harbour coastal waterbody.’

11.2.4.1.3 Surface Water Management

The Infrastructure Design Report accompanying this application under separate cover (OSL Butler 2025b) details the existing services and proposed water connection plan as below;

“The existing lands currently drains by means of a series of sod and stone ditches linking with the surrounding informal ditch regime. There is an existing 300mm diameter surface water pipe to the north of the site, crossing Mountain Road, and eventually discharges into an existing stream running along Forest Road.... It is proposed to service the proposed development by means of a connection to the existing 300mm diameter surface water pipe to the north”.

Sustainable Urban Drainage System (SuDS) are to be incorporated to the design of the Proposed Development where possible. Surface water management for the proposed development is designed to comply with the 'Greater Dublin Strategic Drainage Study (GSDSDS) Regional Drainage Policies Technical Document - Volume 2, New Developments, 2005' and the 'Greater Dublin Regional Code of Practice for Drainage Works, V6.0 2005'. CIRIA Design Manuals C753, C697 and C609 have also been consulted to design the surface water drainage system within the site. (OSL Butler, 2025b).

SuDS features are designed to incorporate the following elements:

- Petrol Interceptors.
- Swales.
- Bioretention Raingardens.
- Tree Pits.
- Permeable Paving.
- Cellular Attenuation System.
- Wetlands and Ponds.

The proposed SuDS features will reduce the runoff volume to greenfield runoff rates via evaporation, transpiration, infiltration and depression storage. A maintenance regime will be in place for the proposed SuDS devices mentioned above in order to facilitate the long-term upkeep of all proposed water treatment and attenuation systems.

11.2.4.1.4 Landscape Plan

The proposed landscape plan as prepared by SRLA (2025) is displayed in Figure 11.2 below. Several biodiversity measures are proposed, many of which have been influenced by the All-Ireland Pollinator Plan 2021-2025. Hedging will consist of native Holly (*Ilex aquifolium*), Willow (*Salix pentandra*) and Blackthorn (*Prunus spinosa*). The plan also includes the planting of native trees including Hazel (*Corylus avellana*), Hawthorn (*Crataegus monogyna*), Downy Birch (*Betula pubescens*), Scots Pine (*Pinus sylvestris*) and Oak (*Quercus robur*) as well as pollinator friendly shrubs on the periphery of the Site and within planting areas within the proposed communal areas.

Consultation between the landscape team and the engineers will result in a consistent approach to SuDS measures including the direction of surface water to sustainable water management infrastructure as outlined in the landscape report.

The landscape plan also aims to alter the existing centre Willow scrub area of the Site into a woodland park. This will involve the removal of some existing trees in conjunction with the Arboricultural plan (mainly Willow), and other existing vegetation in that area, to be replaced with water attenuation areas, relevant to SuDS and open walkways for pedestrian connectivity and social space.



Figure 11.2. Landscape Plan (SRLA, 2025)

11.2.4.1.5 Lighting Plan

Lighting has been developed to be bat and nocturnal wildlife friendly and follow the guidelines set out by the Bat Conservation Trust (BCT) (Collins, 2023) and the Institute of Lighting Professionals (ILP) (2023) Figure 11.3.



Figure 11.3. Mountain Road Illuminance Report (Molloy, 2024)

11.3 Methodology

11.3.1 Scope of Assessment

The specific objectives of the study were to:

- Undertake baseline ecological surveys and evaluate the nature conservation importance of the Site;
- Identify and assess the direct, indirect and cumulative ecological implications or impacts of the Proposed Development during its lifetime; and
- Where possible, propose mitigation measures to remove or reduce those impacts at the appropriate stage of the development.

11.3.2 Desk Study

A desktop study was carried out to collate and review available information, datasets and documentation sources pertaining to the Site's natural environment. The desk study, completed in June 2024 and updated in January 2025, relied on the following sources:

- Information on species records and distributions, obtained from the National Biodiversity Data Centre (NBDC) at maps.biodiversityireland.ie;
- Information on Floral Protection Order (FPO) Bryophytes database at dahg.maps.arcgis.com;
- Information on waterbodies, catchment areas and hydrological connections obtained from the Environmental Protection Agency (EPA) at gis.epa.ie;
- Information on bedrock, groundwater, aquifers and their statuses, obtained from Geological Survey Ireland (GSI) at www.gsi.ie;
- Information on the network designated conservation sites, site boundaries, qualifying interests and conservation objectives, obtained from the National Parks and Wildlife Service (NPWS) at www.npws.ie;
- Satellite imagery and mapping obtained from various sources and dates including Google, Digital Globe, Bing and Ordnance Survey Ireland;
- Information on the existence of permitted development, or developments awaiting decision, in the vicinity of the Proposed Development from the National Planning Application Database available at: <https://housinggovie.maps.arcgis.com/apps/webappviewer/index.html?id=9cf2a09799d74d8e9316a3d3a4d3a8de>; and
- Information on the extent, nature and location of the Proposed Development, provided by the applicant and/or their design team.

A comprehensive list of all the specific documents and information sources consulted in the completion of this report is provided in Section 11.15, References.

11.4 Zone of Influence

The ZOI for a project is the area over which ecological features may be affected by changes as a result of the Proposed Development and associated activities. This is likely to extend beyond the Proposed Development Site, for example where there are ecological or hydrological links beyond the site boundaries (CIEEM, 2018). The ZOI will vary with different ecological features, depending on their sensitivities to an environmental change.

Furthermore, ZOI in relation to European sites is described as follows in the 'OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management' (OPR, 2021):

"The zone of influence of a proposed development is the geographical area over which it could affect the receiving environment in a way that could have significant effects on the Qualifying Interests of a European site. This should be established on a case-by-case basis using the Source-Pathway-Receptor framework and not by arbitrary distances (such as 15 km)."

11.5 Identification of Relevant Designated Sites

To determine the ZOI of the Proposed Development for designated sites, reference was made to the OPR Practice Note PN01 - Appropriate Assessment Screening for Development Management' (OPR, 2021), a practice note produced by the Office of the Planning Regulator, Dublin. This note was published to provide guidance on screening for AA during the planning process, and although it focuses on the approach a planning authority should take in screening for AA, the methodology is also readily applied in the preparation of reports such as this to identify all relevant designated sites potentially linked to the Proposed Development.

As noted above, the most recent guidance advises against the use of arbitrary distances that serve as precautionary ZOI (e.g., 15km), and instead recommends the application of the Source-Pathway-Receptor (S-P-R) model in the identification of designated sites, stating that "This should avoid lengthy descriptions of European sites, regardless of whether they are relevant to the Proposed Development, and a lack of focus on the relevant European sites and issues of importance". Although this statement refers to European sites, it is also applicable to other designated sites.

Thus, the methodology used to identify relevant designated sites comprised the following:

- Identification of potential sources of effects based on the Proposed Development description and details;
- Identification of potential pathways between the Site of the Proposed Development and any designated sites within the ZOI of any of the identified sources of effects.
 - Water catchment data from the EPA (www.epa.ie) were used to establish or discount potential hydrological connectivity between the Proposed Development and any designated sites.
 - Groundwater and bedrock information used to establish or discount potential hydrogeological connectivity between the Proposed Development and any designated sites.
 - Air and land connectivity assessed based on Proposed Development details and proximity to designated sites.
 - Consideration of potential indirect pathways, e.g., impacts to flight paths, *ex-situ* habitats, etc.
- Review of Ireland's designated sites to identify those sites which could potentially be affected by the Proposed Development in view of the identified pathways, using the following sources;
 - European sites and nationally designated sites (e.g., NHAs and pNHAs) from the NPWS (www.npws.ie);
 - Ramsar sites from the Irish Ramsar Wetland Committee (<https://irishwetlands.ie/irish-sites/>);
 - Other internationally designated sites e.g., UNESCO Biosphere's; and
- Regional development plans to identify any remaining sites or areas designated for nature conservation at a local level.

11.6 Field Surveys

11.6.1.1 Preliminary Ecological Appraisal

Preliminary Ecological surveys were carried out on-Site in June 2024. The field survey for the Preliminary Ecological Assessment (PEA) included habitat mapping, an invasive species survey, and a general search for signs of protected species that may be expected to be present based on the desk study, as well as an initial assessment of habitat suitability for same.

11.6.1.2 Habitat and Flora Surveys

Ecological walkovers of the Site were conducted in June 2024 by Enviroguide Consulting. Where possible species compositions and abundance are described using the DAFOR (Dominant, Abundant, Frequent, Occasional or Rare) scale, a simple method of assigning abundance categories to species. Habitats were categorised to level 3, according to the Heritage Council’s ‘A Guide to Habitats in Ireland’ (Fossitt, 2000). The habitat mapping exercise had regard to the ‘Best Practice Guidance for Habitat Survey and Mapping’ (Smith et al., 2011) published by the Heritage Council, and the National Roads Association (now known as Transport Infrastructure Ireland (TII)) guidance on ‘Ecological Surveying Techniques for Protected Flora and Fauna during the Planning of National Road Schemes’ (TII, 2009). Habitats within the surrounding area of the Proposed Development were classified based on views from the Site and satellite imagery where necessary (Google Earth, Digital Globe and OSI). The habitat and flora surveys cover the period considered suitable for such surveys as per the abovementioned guidance (April-October). The surveys also included a search for any rare or protected plant species which may be present at the Site.

11.6.1.3 Invasive Species Surveys

Invasive species surveys were incorporated into the ecological walkovers carried out at the Site. During the ecological walkovers conducted in June 2024, the location of invasive species, where they were encountered, was documented on the field map or through the use of GPS in the field, along with the extent of the area they cover. The invasive plant species survey primarily focused on plant species that are listed on Schedule III of the European Communities (Birds and Habitats) Regulations and considered to be ‘High impact’ invasive species e.g., Japanese Knotweed (*Fallopia japonica*). Incidental observations of other terrestrial plant species known to be potentially invasive, such as Butterfly Bush (*Buddleja davidii*), were also recorded, where found.

11.6.1.4 Non-volant Mammals Surveys

Mammal surveys of the Site were carried out in conjunction with the initial habitat surveys. The Site was searched for tracks and signs of non-volant mammals as per Bang and Dahlstrom (2001) (i.e., mammals which are incapable of flight). The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area.

All accessible watercourses within 150m of the Site were assessed for the presence of Otter (*Lutra lutra*) and for the suitability to support Otters. This involved searching for associated field signs, such as spraints, footprints, anal jelly, holts and couches to best practice guidelines (NRA, 2008).

11.6.1.4.1 Badger Surveys

The possibility for the Site and surrounding areas to hold Badger (*Meles meles*) was also considered during the initial Site survey as per best practice guidelines (Harries, Cresswell & Jefferies 1989; NRA 2005). Further surveys were recommended because of the initial Site visit.

Focused badger surveys were carried out on the 30th of September 2024. Searches were conducted within all suitable areas on Site, including all treelines and hedgerows and woodland. All signs of badger including scat, tracks and setts were recorded and documented as part of the survey. Areas covered are outlined in Figure 11.4 below. The results of badger surveys are detailed in Section 11.9.5.3 below.

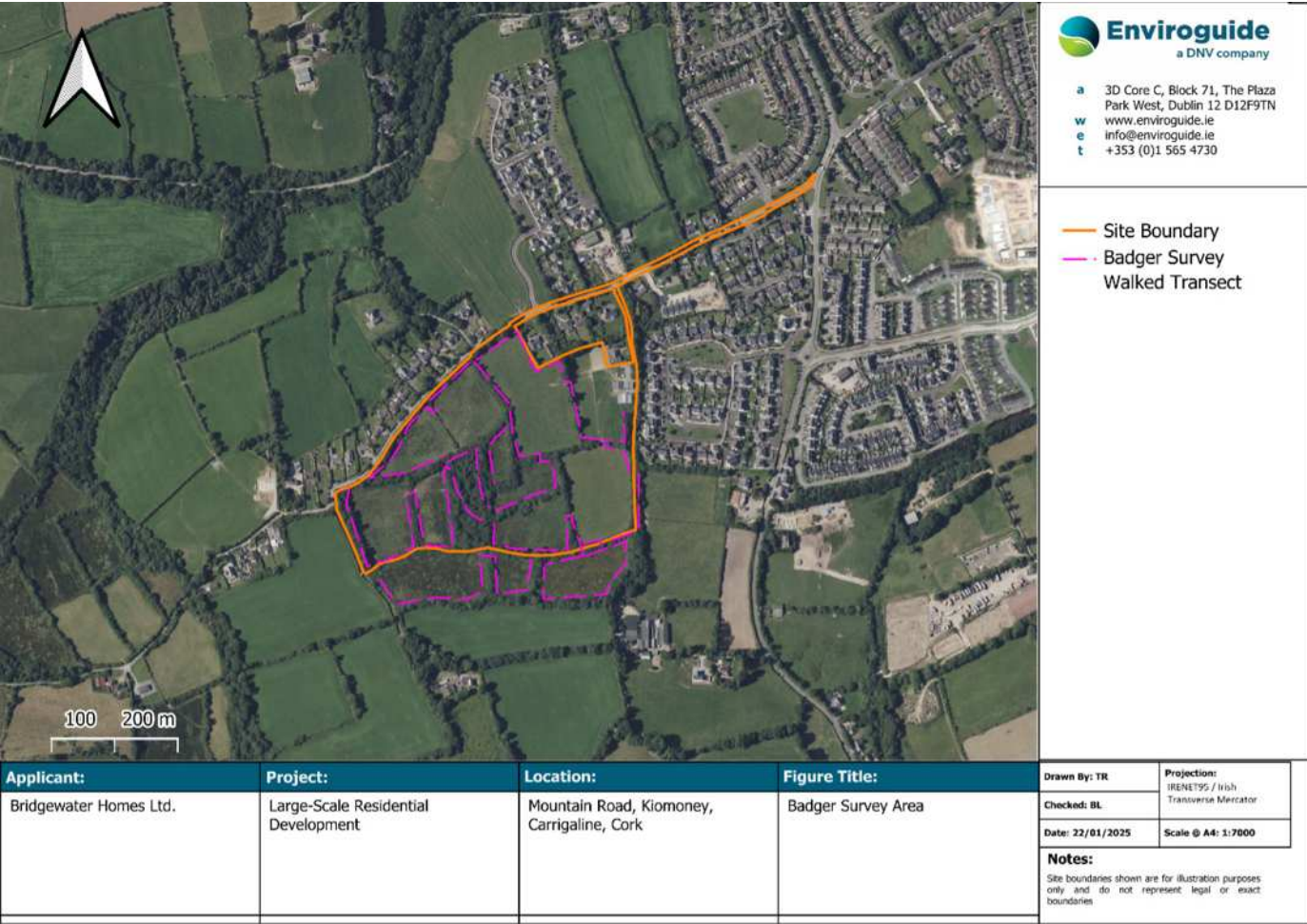


Figure 11.4. Badger Survey Areas Covered

11.6.1.5 Bats

11.6.1.5.1 Preliminary Bat Roost Assessment

A daytime inspection of the Site was undertaken in June 2024, in adherence to best practice guidelines (Collins, 2023). The aim of the inspection was to search for indication of the presence of roosting bats, and to assess the habitat for its ability to support commuting and foraging bats. Buildings and trees on Site were visually assessed from the ground with the aid of a torch and binoculars. The roost inspection comprised a detailed inspection of structures and trees on Site. These were subject to exterior and interior inspections (where possible) to search for evidence of bat use. This includes live and dead specimens, droppings, feeding remains, oil staining and noise (Collins 2023). Trees were searched for Potential Roosting Features (PRFs) such as hollow trunks, knot holes, peeling bark, splits, cracks, and crevices (Collins 2023; Andrews 2018). Collins (2023) recommends that structures and trees are assessed for their ability to support roosting bats under separate categorisations using professional judgement and sub-categories as presented in Table 4.1 (Collins, 2023) and summarised below.

Structures are categorised as:

- Negligible – No suitable features observed, however, a small element of uncertainty remain;
- Low – A structure with one or more roost features as used by individual bats opportunistically at any time of year;
- Moderate – A structure with one or more roost features that could be used by bats on a regular basis or by a larger number of bats; and
- High – A structure with one or more roost features that are obviously suitable for use by a larger number of bats on a regular basis, and potentially for longer periods of time. These features have the potential to support high conservation status roosts.

Trees are categorized separately accordingly to Table 4.2 of Collins (2023). These classifications are:

- NONE – Either no PRFs in the tree or highly unlikely to be any;
- FAR – Further assessment required to establish if PRFs are present in the tree; and
- PRF – A tree with at least one PRF present.

Where a tree contains at least one PRF, each PRF is further assessed according to Table 6.2 (Collins 2023). PRF's are scored as either:

- PRF-I – PRF is only suitable for individual bats or very small numbers of bats either due to size or lack of suitable surrounding habitats.
- PRF-M – PRF is suitable for multiple bats and may therefore be used by a maternity colony.

For trees with PRF-I's only, no further surveys may be required, but appropriate compensation for all PRF-I's must be designed and incorporated in advance of impacts along with a Precautionary Working Method Statement (PWMS). As the Site increases in suitability for roosting bats e.g., PRF-M's present, the survey effort increases accordingly. A PRF-M will require a detailed inspection, such as aerial inspection, conducted over three survey visits, a minimum of three weeks apart, which should be carried out between May and September with at least two in the period May to August. Where features are inaccessible by ladder, climbing, or MEWP, or too extensive for a PRF inspection, the aerial inspection should be replaced with emergence surveys carried out between May and September with Night Vision Aids (NVA) where possible or otherwise surveyed using Advanced Licence Bat Survey Techniques (ALBST), such as trapping, tagging, and radio-tracking to inform of the importance of a roost.

11.6.1.5.2 Preliminary Bat Habitat Suitability Assessment

The Site was also assessed in relation to potential bat foraging habitat and potential bat commuting routes in conjunction with the walkover survey. This assessment evaluated the habitats present on Site and in the wider area for bat foraging and commuting suitability. Habitat suitability is assessed qualitatively from Negligible to High:

- Negligible – No suitable foraging or commuting habitats on Site
- Low – Suitable but isolated habitats that could be used by small numbers of commuting and/or foraging bats, such as poorly connected gappy hedgerows, lone trees, unvegetated streams, etc.
- Moderate – Suitable continuous habitat connected to the wider landscape that could be used by commuting and/or foraging bats, such as treelines, scrub, grassland, water, etc.
- High – Continuous high-quality habitat that is well-connected to the wider landscape, and is likely used regularly by commuting and/or foraging bats, such as river valleys, broadleaved woodland, woodland edge, grazed parkland, etc.

11.6.1.5.3 Bat Landscape Suitability

The Bat Conservation Ireland Landscape Suitability Model (Lundy et al., 2011) provides a habitat suitability index for bat species across Ireland. The model divides the country into 1 km grid squares and ranks the habitat within the squares according to its suitability for various bat species. The scores are divided into five qualitative categories of suitability, namely:

- 0.0000000 - 13.0000000: Low
- 13.0000001 - 21.3333000: Low – Medium
- 21.3333001 - 28.1110999: Medium
- 28.1111000 - 36.4444001: Medium – High
- 36.4444002 - 58.5555999: High

11.6.1.5.4 Bat Activity Surveys (Nighttime Bat Walkover (NBW))

Bat Activity Surveys were carried out on one occasion during the Summer (12th of August) and once in Autumn (10th September) periods of 2024.

The methodology was chosen to ensure all bat commuting and/or foraging activity on/around the Site was adequately quantified. The layout of the Site, proposed works, and current baseline conditions meant that a targeted survey effort (NBW) was most suitable. This methodology was adapted from the most recent bat survey guidelines as described by the Bat Conservation Trust *Bat Surveys for Professional Ecologists: Good Practice Guidelines*, (Collins et al, 2023).

Two set points were surveyed for a 40-minute period after sunset, followed by a transect survey of the Site and its perimeter, targeting the most suitable habitat for commuting and foraging bat species. The NBW vantage points were strategically located adjacent to the central woodland area on Site, in order to account for bats that may be present within this central patch of woodland as this area is largely inaccessible for standard transect surveys, although the perimeter of this area was also walked during the transect survey that followed the initial 40-minute vantage point counts.

11.6.1.5.5 Bat Data Analysis

Species were identified from recordings using Wildlife Acoustics Kaleidoscope Pro, version 3.5.2 software and BatExplorer (version 2.2.6.0). Bat data was analysed, and species assigned to each record with reference to species identification guides such as Russ (2012).

Each record i.e., a sequence of bat calls/pulses, is noted as a bat pass and indicates the level of bat activity for each species recorded. It is important to note that bat passes are representative of activity levels and do not necessarily denote individual bats. For example, some bats such as *Pipistrelle* species may continuously circle a treeline or hedgerow and multiple calls may represent one individual circling an area. Alternatively, Leisler's bats (*Nyctalus leisleri*) recorded early in a survey are likely to be commuting high overhead, and each call may represent a singular bat. Therefore, a bat pass is a measure of activity and is not representative not of the number of bats present.

In general, activity levels are classified from low to high. Low activity comprises less than 10 bat passes per hour, medium is equal to or greater than 10 bat passes per hour, and anything above 50 bat passes per hour is considered high.

11.6.1.6 Birds

11.6.1.6.1 Bird Scoping Survey

During the preliminary Site surveys in June 2024, a list of all bird species encountered was recorded. The survey methodology employed was based on that recommended in standard literature used by for example the British Trust for Ornithology (BTO) (Gillings et al, 2007; Bibby et al, 1992 and Gilbert et al, 1998), which has subsequently been adapted into guidelines for ecological consultants by the Bird Survey & Assessment Steering Group (2022). During the survey, the Site was walked slowly, approaching all habitats within and adjacent to the Proposed Development and scanning and listening for birds. The locations of birds seen and heard were recorded using standard BTO codes and activity symbols, to provide an overview of bird species using the Site.

During this bird survey the Site was thoroughly assessed to determine potential roosting and nesting sites for birds. Special attention was given to identifying areas where birds were likely to congregate or build nests, such as trees, hedgerows and scrub, and other habitable structures where they may occur.

During the inspection, any signs of bird activity were documented. This included the presence of birds themselves, their nests, feathers, droppings, and any other indicative evidence.

11.6.1.6.2 Breeding Bird Surveys

In addition to the initial Site walkover in June 2024, one dedicated Breeding Bird Survey was carried out on the 7th of August 2024 to inform the evaluation of the on-Site habitats for breeding bird species. The survey was carried out in accordance with and adapted from standard literature and guidelines set out in for example Gilbert et. al. (1998), Bibby et al (2000), Gillings et al (2007) and Birdwatch Ireland & National Parks and Wildlife Service (2012), which has subsequently been adapted into guidelines for ecological consultants by the Bird Survey & Assessment Steering Group. (2022).

During the survey, the Site was walked slowly, approaching all habitat within and adjacent to the Proposed Development and scanning and listening for birds. The presence of all birds on Site was recorded with all possible, probable, and confirmed breeding activity recorded where relevant.

This survey was carried out and designed in order to account for bird species most likely to be encountered in the area based on the habitats present and results of the desk study. The ZOI in relation to birds was set at 500m based on the Proposed Development description and the avifauna species most likely to be encountered on Site and in the surrounding hinterland. The ZOI was chosen with cognisance to guidelines set out by the Bird Survey & Assessment Steering Group (2022) and all surveys were carried out by experienced and suitably qualified ornithologists (TR and BMC). Breeding Bird Surveys were carried out as a precautionary measure and in addition to a previous Site visit which was carried out during the core breeding season (June 2024).

The effectiveness of the August visit was limited by timing (outside the optimal survey period for common passerines and most raptor species). However, the two Site visits, the experience of the surveyor, coupled with the habitats encountered on Site means that the assemblages of breeding birds, both within and in the hinterland of the Site have been adequately accounted for and will be fully considered as part of the assessment of the Proposed Development.

Table 11.1 Survey Effort with weather conditions during Breeding Bird Survey at the Proposed Development

Date	Start Time	Duration	Weather Conditions
07/08/24	14:00	16:30	Light Breeze, dry, good visibility, 15°C, 33-66% cloud cover.

11.6.1.7 General Fauna Surveys

The Site was assessed for the presence of fauna other than mammals and birds in conjunction with the habitat surveys undertaken at the Site. The Site was searched for signs of aquatic fauna (incl. amphibians, fish and invertebrates), reptiles and rare/endangered invertebrates, and habitats were assessed for their potential suitability for same.

11.6.2 Consultation

A pre application Section 32B meeting was held on the 14th of November 2024 in consultation with Cork County Council, and the council subsequently issued an LRD Opinion.

With respect to Ecology, the LRD Opinion noted that an EcIA must be prepared for the project, along with an AA Screening and NIS if required.

The EcIA carried out in this Biodiversity Chapter includes the following as highlighted in the LRD Opinion:

- A detailed description of habitats occurring on Site;
- A description of species occurring on Site;
- Description of bats on the Site based on appropriate bat surveys, and appropriate mitigation where required;
- Consideration of avian species breeding on Site, and appropriate mitigation where required;
- Details of any planned retention, protection and management of hedgerows on Site;
- Details of existing badger sett on site; and
- Consideration of the Site’s potential to support amphibian species.

An AA Screening was prepared in accordance with the Habitats Directive, and found no potential for likely significant impacts on any European sites, including the Cork Harbour SPA mentioned in the LRD Opinion. Therefore, there was no requirement to proceed to Stage 2 AA, and NIS was not prepared.

11.7 Ecological Assessment

This Report has been undertaken following the methodology set out in Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018); and with reference to the National Roads Authority ‘Guidelines for Assessment of Ecological Impacts of National Road Schemes’ (NRA, 2009) and the Environmental Protection Agency (EPA) ‘Guidelines on the information to be contained in Environmental Impact Assessment Reports’ (EPA, 2022) and BS 42020:2013 Biodiversity: Code of practice for planning and development (BSI, 2013).

The evaluation of significant effects should be based on available scientific evidence. Based on the precautionary principle, if the available information is not sufficient, then a significant effect may be assumed likely to occur.

11.7.1 Evaluation of Ecological Features

The value of the ecological features, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation at different geographical scales (NRA, 2009), presented in Appendix 11.2. This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. Based on best practice (CIEEM, 2018), any features considered to be less than of local value are not assessed within this EcIA.

11.7.2 Impact Assessment

As per NRA guidelines, impact assessment is only undertaken of Key Ecological Receptors (KERs). The assessment of the potential impact of the Proposed Development on the identified KERs was carried out with regard to the criteria outlined in the EPA Guideline (EPA, 2018). These guidelines set out a number of parameters that should be considered when determining which elements of the Proposed Development could constitute impact or sources of impacts. These include;

- Positive, neutral or negative effect;
- Significance;
- Extent;
- Probability;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process, or feature, e.g., the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to an adverse effect of a sensitive habitat.

11.7.3 Assessment of Cumulative Impacts and Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a Proposed Development results in individually insignificant impacts that, when considered in combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Relevant plans and policies (see Section 11.10.5.2) were reviewed to identify any potential for negative cumulative impacts with the Proposed Development. Additionally, existing planning permissions from the past five years (from 2018 onwards) within the ZOI of the Proposed Development were reviewed, with particular focus on potential cumulative impacts on the identified KERs. Long-term developments were also considered where applicable.

11.7.4 Avoidance, Mitigation, Compensation and Enhancement Measures

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM Guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement. When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

It is important for the EcIA to clearly differentiate between avoidance, mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g., through changes in scheme design. In practice, avoidance measures are typically implemented during the design stage via discussions and re-design (e.g., avoiding a sensitive habitat by relocating a building). Avoidance measures are therefore rarely reported within an EcIA, which focuses on assessing the final design.
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ.
- Compensation describes measures taken to offset residual effects, i.e. where mitigation in situ is not possible.
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

11.8 Limitations

Every effort has been made to provide a comprehensive description of the site; however, the following specific limitations apply to this assessment:

- The timing and quantity of Breeding Bird Surveys was less than optimal and outside the optimal period for surveying breeding birds. (Gilbert et al, 1998; Bird Survey & Assessment Steering Group. 2024). The guidelines for breeding bird surveys advises monthly visits in areas of high quality, or seasonal visits in areas of moderate suitability, at the discretion of the competent ecologist, depending on the species likely to be present. The Site area can reasonably be categorised as moderate in terms of importance for migrating breeding birds and resident species all year round. A minimum of three Breeding Bird Survey visits during the core breeding season would be the optimal and recommended survey effort for a Site of this nature, i.e., ecologically high-quality hedgerows, the presence of mature semi-natural woodland and semi natural wet grassland. One non-bird specific Site visit was made in June and one bird-specific survey was carried out in August, outside the core breeding season. As stated in Section 11.6.1.6.2 above, this will be accounted for in the assessment of the Proposed Developments likely impact on the receiving environment, including the implementation of mitigation and enhancement measures, and is not considered to be a significant limiting factor due to the nature of the Site and the proposed landscape plan and design of the Proposed Development e.g. the retention of hedgerows and an appropriate, ecologically sensitive lighting plan.
- Quantity of Bat activity Surveys. Ideally, based on best practice, a full suite of bat activity surveys would be carried out prior to assessment (Collins, 2023). The Site was visited and surveyed for bats using the Nighttime Bat Walkover Survey method (NBW) on three occasions (twice in Summer and once in Autumn, 2024) which is below the recommended survey

effort for areas with moderate bat foraging and commuting potential, which would ideally include an additional visit during the Spring period (Collins, 2023). This is not considered to be a significant limiting factor due to the nature of the Site, the proposed landscape plan, and the design of the Proposed Development e.g. the retention of hedgerows and an appropriate ecologically sensitive lighting plan.

- The device used on the 10th of September was a batlogger Echometer touch. The software used to analyse data from this device (Kaleidoscope Pro) does not provide GPS coordinates and so exact detection locations could not be displayed on a map as they could with the August transect. Similarly, the displayed transect route is an approximation. Given the presence of an experienced ecologist undertaking the survey and taking field notes, this is not a significant limitation.
- An extensive search of available datasets for records of rare and protected species within proximity of the Proposed Development has been undertaken as part of this assessment. However, the records from these datasets do not constitute a complete species list. The absence of species from these datasets does not necessarily confirm an absence of species in the area.

11.9 Ecological Baseline Conditions

This Section sets out the baseline conditions for the ecological features within the Site using the findings of the desk study and field surveys.

11.9.1 Hydrology, Geology and Hydrogeology

The Site is located in the Lee, Cork Harbour and Youghal Bay catchment (Catchment ID. 19) and in the Owenboy[Cork]_SC_010 sub-catchment (Sub-catchment ID. 19_15) (EPA, 2025).

The Owenboy [Cork] river is located 0.24km west of the Site at its nearest point, and flows northwards then eastwards and ultimately discharges to the Cork Harbour coastal water body (EU Code: IE_SW_060_0000) located 8.2km east of the Site with linear distance via Owenboy Estuary (EU Code: IE_SW_060_1200) as transitional waterbodies.

The EPA water quality monitoring data for a station located closest to the Site is summarised in Table 11.2. The reported Q-value results indicate that water quality in the rivers in the vicinity of the Site is ‘Moderate’.

The EPA data indicates that there is an upward trend in Total Oxidised Nitrogen (as N) and ortho-Phosphate (as P) - unspecified for the water course for the period 2013-2018 (EPA, 2025) at Ballea Br (Lower) (RS19O011400) located in Owenboy [Cork] rivers.

Table 11.2. EPA Monitoring Stations and assigned Q Values

EPA Monitoring Station name	Station Code	Location from Site	Distance from Site	Assigned Q value
Ballea Br (Lower)	RS19O011400	Northwest upstream	1.55km	3-4 “Moderate”

The Site of the Proposed Development is situated on the Ballinhassig East (IE_SW_G_004) groundwater body. The bedrock aquifer identified beneath the Site is mapped as “Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones” (LI) (GSI, 2025).

The Groundwater Vulnerability Rating assigned to groundwater beneath the majority of the Site is mapped as “High” (H) and the eastern portion of the Site is mapped as “Moderate” (M) (GSI, 2025).

The soil beneath the entire area of the Site is mapped as “Acid Deep Poorly Drained Mineral” (TNSSs) described as “Deep poorly drained mineral - Derived from mainly non-calcareous parent material” (GSI, 2025).

The quaternary sediments beneath the entire area of the Site are mapped as Till derived from Namurian sandstones and shales (TNSSs) and the subsoil beneath the entire area of the Site is mapped as Shales and sandstones till (Namurian) (clayey) (TNSSs) (GSI, 2025).

The Waterbody Status for river, groundwater, transitional and coastal water bodies relevant to the Site as recorded by the EPA in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Table 11.3.

Table 11.3. WFD Risk and Water Body Status

Waterbody Name	Water body; EU code	Location from Site	Distance from Site (km)	WFD water body status (2016-2021)	WFD 3 rd cycle Risk Status	Hydraulic Connection to the Site
Surface Water Bodies						
West Carrigaline river	IE_SW_19O011400	North	0.28	Moderate	At risk	Downstream of the Site.
Healy's Bridge	IE_SW_19O011400	West	0.26	Moderate	At risk	Downstream of the Site.
Owenboy [Cork] river	IE_SW_19O011400	Northeast	1.1	Moderate	At risk	Downstream of the Site.
Owenboy Estuary	IE_SW_060_1200	East	1.29	Moderate	At risk	Downstream of the Site.
Cork Harbour coastal water body	IE_SW_060_0000	East	8.8	Moderate	At risk	Downstream of the Site.
Groundwater Bodies						
Ballinhassig East	IE_SW_G_004	N/A	N/A	Good	Not at risk	Underlying groundwater-body

11.9.1.1 Site Drainage

There were a few ‘stone ditches’ located on Site as outlined in the Landscape report (SRLA, 2025), most of which were completely dry and free of any surface water or aquatic plants. The central woodland area was waterlogged and as such was classed as ‘Wet Willow Alder Ash Woodland’ (Fossit, 2000). The surface water associated with the woodland appeared to drain northwards to an existing Drainage Ditch (FW4) (Fossitt, 2000) at the field boundary. There are a number of drainage channels present on Site. Many appeared to be stagnant in nature with deeper channels located on the southern boundary with flowing water channelling northwards towards the northern outflow at Mountain Road.

Further detail on existing Site drainage conditions can be found in Chapter 10 of this EIAR.

11.9.2 Designated Sites

All European sites potentially linked to the Proposed Amendments have been identified and fully assessed in the AA Screening Report (Stage 1 AA) accompanying this submission under separate cover. A summary of the AA conclusions is given below.

Other Nationally or Internationally designated sites potentially linked to the Proposed Development are identified in Section 11.9.2.3 below.

11.9.2.1 European Sites Appropriate Assessment (AA)

An AA has been completed (Stage 1; Screening) for the Proposed Development which identified any potential S-P-R links to designated European Sites. The Site of the Proposed Development is not located within or adjacent to any designated European Sites and neither direct or indirect habitat loss or disturbance is considered an issue in this case (Table 11.4). The Proposed Development will not be dependent on any resource use of any European Sites. As such, European sites are not considered further in this Report.

Table 11.4. European Sites considered with the Source-Pathway-Receptor (S-P-R) method to establish notable links between the sources of effects arising from the Proposed Development, and any European Sites.

Site Name & Site Code	Qualifying Interests (*= priority habitats)	Potential Pathways
Special Protection Areas (SPAs)		
Cork Harbour SPA	As per NPWS (2014) SCI Species • Little Grebe (<i>Tachybaptus ruficollis</i>) [A004] • Great Crested Grebe (<i>Podiceps cristatus</i>) [A005] • Cormorant (<i>Phalacrocorax carbo</i>) [A017] • Grey Heron (<i>Ardea cinerea</i>) [A028] • Shelduck (<i>Tadorna tadorna</i>) [A048] • Wigeon (<i>Anas penelope</i>) [A050] • Teal (<i>Anas crecca</i>) [A052] • Pintail (<i>Anas acuta</i>) [A054] • Shoveler (<i>Anas clypeata</i>) [A056] • Red-breasted Merganser (<i>Mergus serrator</i>) [A069] • Oystercatcher (<i>Haematopus ostralegus</i>) [A130] • Golden Plover (<i>Pluvialis apricaria</i>) [A140] • Grey Plover (<i>Pluvialis squatarola</i>) [A141] • Lapwing (<i>Vanellus vanellus</i>) [A142] • Dunlin (<i>Calidris alpina</i>) [A149] • Black-tailed Godwit (<i>Limosa limosa</i>) [A156] • Bar-tailed Godwit (<i>Limosa lapponica</i>) [A157] • Curlew (<i>Numenius arquata</i>) [A160] • Redshank (<i>Tringa totanus</i>) [A162] • Black-headed Gull (<i>Chroicocephalus ridibundus</i>) [A179] • Common Gull (<i>Larus canus</i>) [A182] • Lesser Black-backed Gull (<i>Larus fuscus</i>) [A183] • Common Tern (<i>Sterna hirundo</i>) [A193] • Wetland and Waterbirds [A999]	Indirect via a combined hydrogeological and hydrological pathway. Indirect via foul water treatment at Ringaskiddy WWTP.
	Additional Annex II species as per SDF update 2021 • Mallard (<i>Anas platyrhynchos</i>) [A053] • Gadwall (<i>Anas strepera</i>) [A051] • Turnstone (<i>Arenaria interpres</i>) [A169] • Pochard (<i>Aythya ferina</i>) [A059] • Tufted Duck (<i>Aythya fuligula</i>) [A061] • Goldeneye (<i>Bucephala clangula</i>) [A067] • Red knot (<i>Calidris canutus</i>) [A143] • Ringed Plover (<i>Charadrius hiaticula</i>) [A137] • Whooper Swan (<i>Cygnus cygnus</i>) [A038] • Coot (<i>Fulica atra</i>) [A125] • Black-headed Gull (<i>Larus ridibundus</i>) [A179] • Greenshank (<i>Tringa nebularia</i>) [A164]	
Linear Distance to Proposed Development: approx. 1.55km NE		

11.9.2.1.1 Potential Impact Pathways

11.9.2.1.1.1 Direct Pathways

The nearest designated site to the Proposed Development is the Owenboy pNHA, located approx. 1.55km northeast of the Site within the Owenboy Estuary. Drawing on the assessments from the accompanying AA Screening (Enviroguide, 2025), there are no direct hydrological or hydrogeological pathways between the Site and the designated sites within the estuary. The distance via air to the nearest designated site (Owenboy pNHA) is over 1.5km northeast of the Site, and this distance is deemed sufficient to exclude the potential for propagation of impacts via air and land pathways.

11.9.2.1.1.2 Indirect pathways

The AA Screening identified two potential indirect pathways to the Cork Harbour SPA, and due to the overlap with this SPA, these pathways are also relevant to the aforementioned pNHAs, Cork Harbour Ramsar Site and Cork Harbour IBA:

- A combined hydrogeological and hydrological pathway via groundwater discharge into the nearby streams and ultimately the Owenboy estuary; and
- Via foul water treatment at Ringaskiddy WWTP.

The identified i-WeBS site (site code: OL403) approx. 10km north of the Proposed Development is considered to be located sufficiently far from the Site, and upstream within the estuarine habitats, to render any potential direct or indirect impact pathways negligible.

11.9.2.2 Relevant Designated Sites

A designated site will only be at risk from likely significant effects where an S-P-R link of note exists between the Proposed Development and the designated site. All designated sites considered as part of the S-P-R method are listed in Table 11.5, and shown in Figure 11.5 and Figure 11.6.

Those sites with notable S-P-R links to the Proposed Development are assessed further in this report as KERs of ‘National Importance’ (pNHAs and NHAs) or ‘International Importance’ (SACs/SPAs, UNESCO sites, Ramsar sites, etc.).

Table 11.5. Showing a complete list of Designated Sites which have been considered with the Source-Pathway-Receptor (S-P-R) method to establish notable links between the source of effects arising form the Proposed Development, and any relevant Designated Sites.

Site Name & Site Code	Designation Rationale	Potential Pathways
Natural Heritage Areas (NHAs)		
There are no Natural Heritage Areas within the zone of influence of the Proposed Development or with a potential pathway to the Proposed Development.		
Proposed Natural Heritage Areas (pNHAs)		
Owenboy River pNHA (001990) Linear Distance to Proposed Development – 1.3km northeast	There are no formal qualifying interests listed for proposed Natural Heritage Areas, however these sites overlap with the Cork Harbour SPA and the designation of this site is likely to align with the conservation objectives and qualifying interests of the SPA.	Indirect via a combined hydrogeological and hydrological pathway into Owenboy Estuary.
Lough Beg (Cork) pNHA (001066) Linear Distance to Proposed Development – 5.6km northeast		Indirect via foul water treatment at Ringaskiddy WWTP and discharge into Cork Harbour.
Monkstown Creek pNHA (001979) Linear Distance to Proposed Development – 4.7km northeast		
Ramsar Sites		
Cork Harbour Ramsar Site (Site ID: 837) & IBA Linear Distance to Proposed Development 5.7km northeast	This Ramsar site also overlaps with the Cork Harbour SPA. <i>“Cork Harbour is part of a sheltered bay system with several river estuaries. The Site consists of four separated intertidal mud and sand flats. The tidal regime is complex, as the mudflats flood and empty rapidly rather than following a normal twelve-hour tidal cycle. These habitats regularly support 20,000 wintering waterbirds, making it one of the top five waterbird sites in Ireland.” (Ramsar, 2022). A Site synopsis is available at Ramsar Sites Information Service: https://rsis.ramsar.org/ris/837</i>	Indirect via foul water treatment at Ringaskiddy WWTP and discharge into Cork Harbour.

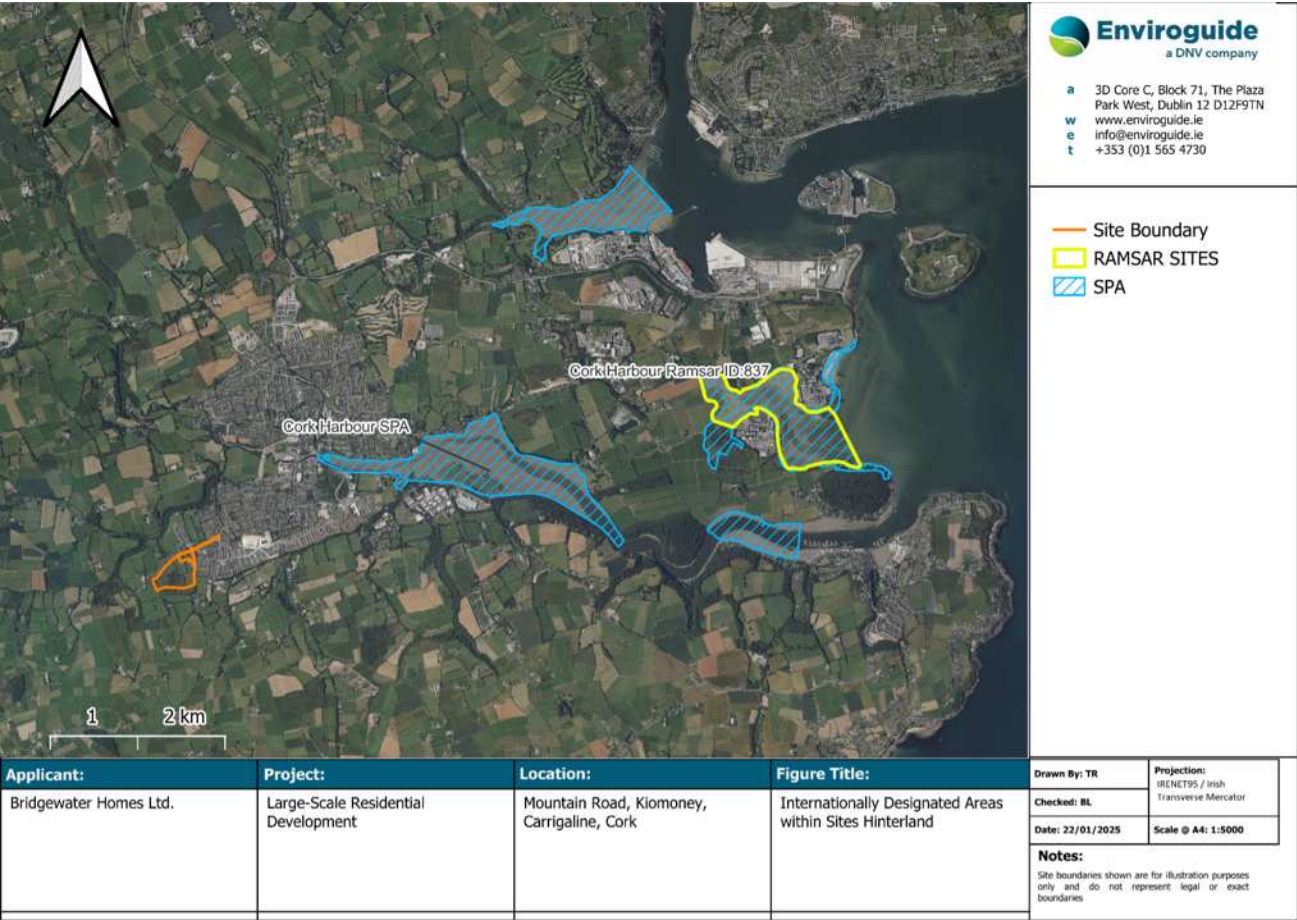


Figure 11.5. Internationally designated sites in relation to the Proposed Development.

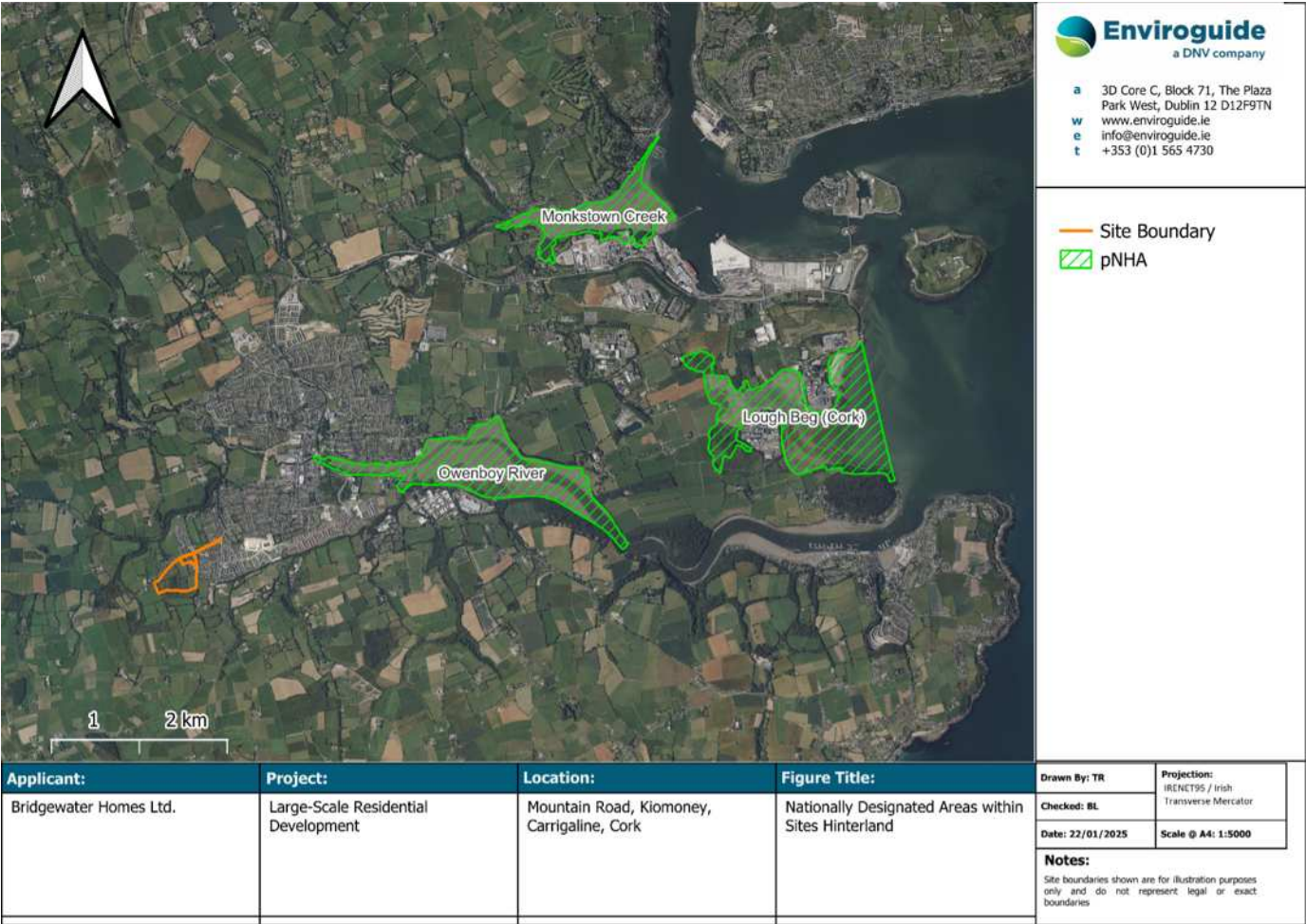


Figure 11.6. Nationally designated sites in relation to the Proposed Development.

11.9.3 Habitats

The habitats present within the Site, as recorded during field surveys, are described below. Site photographs of these habitats are included after each habitat Section and a map of the habitats is presented in Figure 11.16.

The Site is comprised mainly of existing farmland with Semi-Natural Wet Grassland (WS4) dominating the open areas of the Site to the west and centre of the Proposed Development. The wet grassland areas have a moderate to high plant species diversity with soft underfoot conditions in most places, underlain by poorly drained mineral soils (Teagasc, 2024). There are Improved Grassland (GA1) areas to the east where more intensive land use is evident, showing the hallmarks of added artificial fertilisers and intensive grazing with low plant species diversity, these areas have a comparable soil substrate to the Wet Grassland areas but differ in their current and past management. The underlying geology can be described as predominantly 'Till derived from Namurian sandstones and shales'.

The Site is bordered and interspersed with good quality hedgerows, some of which are c.8-10m in width, most notably at the western and southern borders of the Site. Scrub is common along the periphery of the hedgerows and on the borders of the

central strip of Wet willow-alder-ash woodland (WN6). This woodland area is dominated by Willow (*Salix sp.*) with Ash (*Fraxinus excelsior*) present in isolated pockets. A drainage ditch (FW4) is present in the centre of the Site adjacent to the woodland and contains stagnant surface water which appears to be linked with the wet condition present within the woodland area.

No rare or protected plant species were observed during the ecological walkovers, nor were any protected species records uncovered during the desk.

In summary, habitats recorded on Site during the ecological walkover include:

- WN6 - Wet willow-alder-ash woodland
- GS4 - Wet Grassland
- WS1 - Hedgerows
- WL2 – Treeline
- FW4 – Drainage Ditches
- WS2 – Scrub

11.9.3.1 Wet willow-alder-ash woodland (ED2)

A strip of woodland runs north to south in the centre of the Site (Figure 7). The area of woodland is c. 1ha and is dominated by Willow with isolated areas of Ash, and scrub dominating the outer periphery. The woodland contains a high proportion of mature Willow specimens with Ash also present, also mature, some showing signs of the onset of Ash Dieback disease. An arborist report will deal with the removal of such specimens under separate cover. The field layer contained Soft-shield Fern (*Polystichum setiferum*) and Foxglove (*Digitalis purpurea*).



Figure 11.7. Wet alder-ash-woodland (ED2)



Figure 11.8. Wet alder-ash-woodland (ED2)

11.9.3.2 Wet Grassland (GS4)

The Wet Grassland areas on Site were dominated by *juncus sp.* including Compact Rush (*Juncus conglomeratus*) and Soft Rush (*Juncus effusus*) (Figure 11.9). The grassland also contained grasses such as Yorkshire-fog (*Holcus lanatus*) and Creeping Bent (*Agrostis stolonifera*) in addition to small sedges and flowering plants such as Forget-me-not (*Myosotis arvensis*), Ragged Robin (*Silene flos-cuculi*), Lady's Smock (*Cardamine pratensis*), Marsh Ragwort (*Jacobaea aquatica*), Creeping Buttercup (*Ranunculus repens*), and Marsh Thistle (*Cirsium palustre*), with Herb Robert (*Geranium robertianum*) and species such as Bramble (*Rubus fruticosus*) on the field edges, within areas of scrub which grade into hedgerows that intersect the Site.



Figure 11.9. Wet Grassland (GS4)

11.9.3.3 Hedgerows (WS1)

Hedgerows circulate the periphery and intersect the footprint of the Site (Figure 11.10). They are of very good ecological quality (i.e., tall, wide and largely unmanaged, supporting a greater variety of species when compared to narrow more intensively managed hedgerows), particularly on the western side. They are 8-10m thick in some places with a variety of common species such as Bramble, Blackthorn (*Prunus spinosa*) Hawthorn (*Crataegus monogyna*), Honeysuckle (*Lonicera periclymenum*) and Gorse (*Ulex europaeus*), grading into wet grassland in most areas.



Figure 11.10. Hedgerows (WL1)

11.9.3.4 Scrub (WS1)

Areas of scrub are present at the edges of the hedgerows (Figure 11.11), and intersecting the Site. Scrub that has developed along the boundary of the Site and immediately off-Site comprise of common species including bramble and Gorse.



Figure 11.11. Scrub (WS1) (adjacent to Wet Grassland and Treeline)

11.9.3.5 Treeline (WL2)

Treelines are present along the fringes of the Site (Figure 12). Species present included Ash, Beech (*Fagus sylvatica*), Scots Pine (*Pinus sylvestris*) and non-native and invasive Sycamore (*Acer pseudoplatanus*) which is present on the northern edge of the Site on the border with Mountain Road.



Figure 11.12. Treeline (WL2)

11.9.3.6 Drainage Ditches (FW4)

An artificial man-made drainage ditch runs in a western direction from the northwest corner of the centre strip of woodland (Figure 11.13). This drainage ditch contains stagnant water with little or no flow evident. The drainage channel is associated with the woodland in that the water appears to be draining from the wet woodland area on Site. The channel comes to an end on-Site with no obvious outflow through the Site boundary.



Figure 11.13. Drainage Ditch (FW4)

11.9.3.7 Improved Agricultural Grassland (GA1)

Th eastern portion of the Site is dominated by improved grassland (Figure 11.14). Grazing by livestock is a common occurrence with horses present on most Site visits. The area was tightly grazed with little herbaceous material. Common perennial weeds were common in scattered areas of the grassland.



Figure 11.14. Improved Agricultural Grassland



Figure 11.15. Aerial image of Buildings and Artificial Surfaces

11.9.3.8 Buildings and Artificial Surfaces (BL3)

The farmyard area on the eastern boundary of the Site contains agricultural sheds which are of steel, pre-fabricated construction (Figure 11.15). These buildings are of limited value ecologically but do hold potential for hosting breeding bird species such as swallow (*Hirundo rustica*) or house martin (*Delichon urbicum*) during the breeding summer period. No evidence of use by birds or presence of species such as swallow or house martin were recorded in proximity to the buildings during Site visits in summer 2024 and a detailed inspection was not carried out within the farm buildings due to a change in project scope post 2024 surveys.

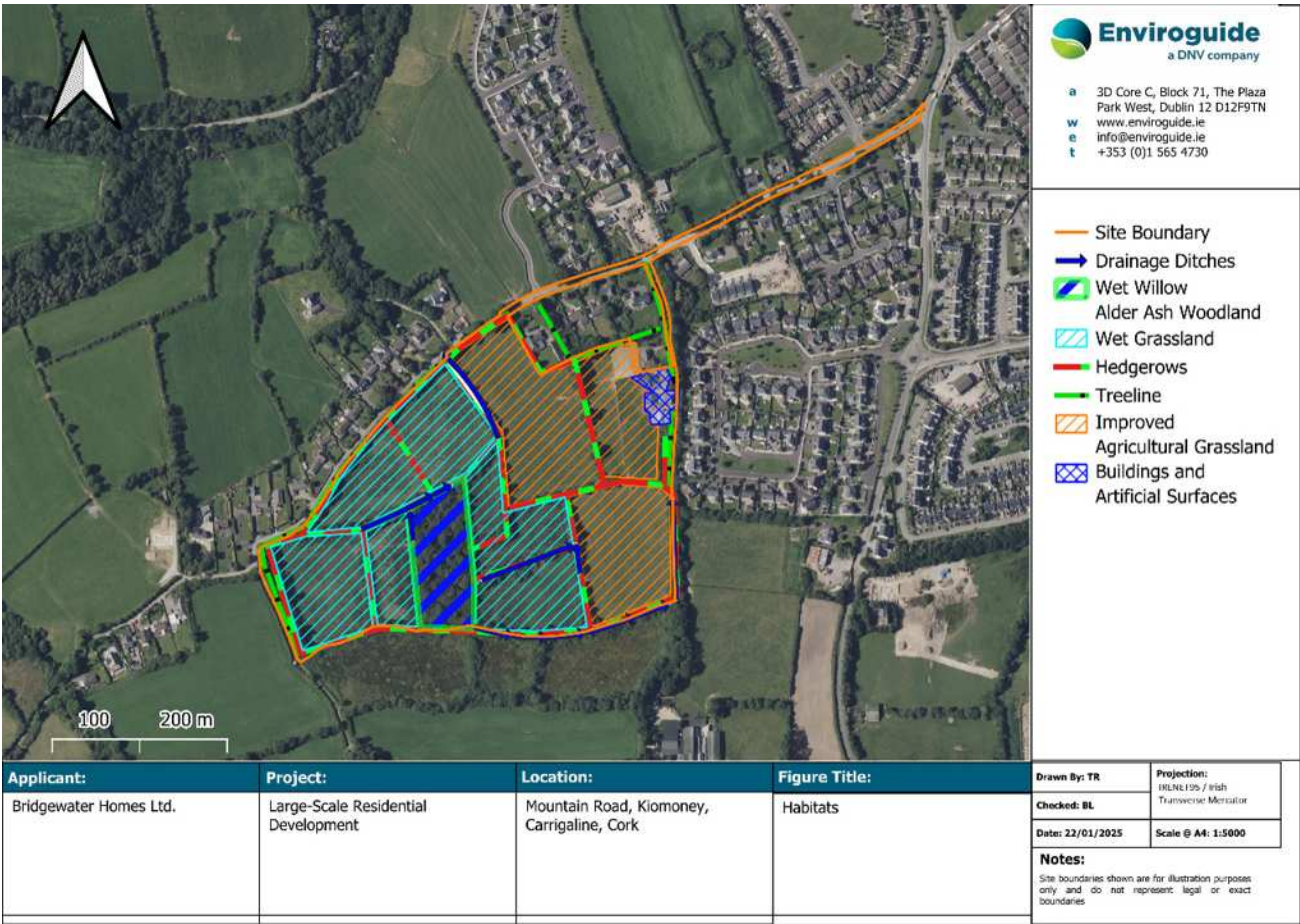


Figure 11.16. Habitat map

11.9.4 Flora

11.9.4.1 Rare and Protected Flora

The Site of the Proposed Development is located within the Ordnance Survey 10km Grid Square (W76), 2km Grid Square (W76A) and split almost equally between 1km Grid Squares (W7160 & W7161). Species records from the NBDC online database for these grid squares were studied for the presence of rare and/or protected species within the last 20 years. This database contained no records of protected flora within the last 20 years. Similarly, no rare or protected floral species were recorded during the Site visits.

A historic record of the Threatened Species: Endangered Meadow Barley (*Hordeum secalinum*) was discovered during the desk study. The record was made in the year 1845 and no recent records for the species have been made. The record originates from the neighbouring 1km grid square, c. 1km west of the Site.

11.9.4.2 Invasive Species

No records of invasive species exist for the 2km Grid Square encompassing the Site. As a reference to the invasive species present in the surrounds of the Site, Table 11.6 below lists the invasive species previously recorded within 10km grid square W76.

Table 11.6. Invasive species records (NBDC Database) from the W76 10km grid square encompassing the Site.

Species	Grid square	Date of last record	Source	Designations
Butterfly-bush (<i>Buddleja davidii</i>)	W76	16/08/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species
Cherry Laurel (<i>Prunus laurocerasus</i>)	W76	31/01/2024	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species
Common Cord-grass (<i>Spartina anglica</i>)	W76	01/08/2012	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Evergreen Oak (<i>Quercus ilex</i>)	W76	18/09/2006	Species Data from the National Vegetation Database	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species
Himalayan Honeysuckle (<i>Leycesteria formosa</i>)	W76	26/10/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species
Japanese Knotweed (<i>Fallopia japonica</i>)	W76	20/07/2021	National Invasive Species Database	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Least Duckweed (<i>Lemna minuta</i>)	W76	31/12/2002	National Invasive Species Database	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species
Narrow-leaved Ragwort (<i>Senecio inaequidens</i>)	W76	11/06/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species
Red Oak (<i>Quercus rubra</i>)	W76	12/05/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species

Species	Grid square	Date of last record	Source	Designations
<i>Rhododendron ponticum</i>	W76	13/04/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> High Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Russian-vine (<i>Fallopia baldschuanica</i>)	W76	05/08/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species
Sea-buckthorn (<i>Hippophae rhamnoides</i>)	W76	21/08/2022	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Spanish Bluebell (<i>Hyacinthoides hispanica</i>)	W76	14/04/2021	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Sycamore (<i>Acer pseudoplatanus</i>)	W76	31/03/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species
Three-cornered Garlic (<i>Allium triquetrum</i>)	W76	21/02/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species Invasive Species: Invasive Species >> Regulation S.I. 477 (Ireland)
Traveller's-joy (<i>Clematis vitalba</i>)	W76	05/08/2023	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species
Turkey Oak (<i>Quercus cerris</i>)	W76	29/11/2018	Vascular plants: Online Atlas of Vascular Plants 2012 Onwards	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species

11.9.4.3 Field Study Results

The ecological walkover completed by Enviroguide Consulting on the 4th of June 2024 did not record any invasive non-native species listed on schedule III of the European Communities (Birds and Natural Habitats) Regulations 2011 (SI 477 of 2011) within the Proposed Development Site.

Sycamore (*Acer pseudoplatanus*), a Medium-impact invasive species was present in the treeline at the northeast boundary of the Site, bordering Mountain Road during the ecological walkover.

11.9.5 Non-volant Mammals (excl. bats)

11.9.5.1 Desk Study Results

Records for terrestrial mammals were obtained from the NBDC online database. Table 11.7 lists these species, their date of last record and summarises their protected status/designation. A total of six native terrestrial mammals were recorded within the 2km grid square associated with the Site.

Table 11.7. Records of terrestrial mammals (Native and Non-Native) for the surrounding 2km (W76A) Grid Square associated with the Site (NBDC)

Species	Grid square	Date of last record	Source	Designations
Native Species				
Eurasian Badger (<i>Meles meles</i>)	W76A	31/12/2007	Badger Setts of Ireland Database	Protected Species: Wildlife Acts
Eurasian Pygmy Shrew (<i>Sorex minutus</i>)	W76A	17/06/2008	Atlas of Mammals in Ireland 2010-2015	Protected Species: Wildlife Acts
Eurasian Red Squirrel (<i>Sciurus vulgaris</i>)	W76A	25/10/2017	Mammals of Ireland 2016-2025	Protected Species: Wildlife Acts
Irish Hare (<i>Lepus timidus subsp. hibernicus</i>)	W76A	15/06/2011	Atlas of Mammals in Ireland 2010-2015	
Red Fox (<i>Vulpes vulpes</i>)	W76A	01/04/2018	Mammals of Ireland 2016-2025	
West European Hedgehog (<i>Erinaceus europaeus</i>)	W76A	05/05/2022	Hedgehogs of Ireland	Protected Species: Wildlife Acts
Invasive Non-Native Species				
European Rabbit (<i>Oryctolagus cuniculus</i>)	W76A	10/07/2016	Mammals of Ireland 2016-2025	Invasive Species: Invasive Species Invasive Species: Invasive Species >> Medium Impact Invasive Species

11.9.5.2 Field Survey Results

During the ecological walkover of the Site on the 4th of June 2024, the Site was checked for any evidence of fauna presence/activity on Site. There was no direct evidence of Badger or any other mammals on Site, however the Site contains potentially suitable commuting, foraging and resting habitat for Badger and other small mammals such as Hedgehog (*Erinaceus europaeus*), Irish Stoat (*Mustela erminea Hibernica*) and Pine Marten (*Martes martes*).

It is noted that there are no suitable waterbodies located within the Proposed Development Site capable of supporting aquatic mammals such as Otter.

11.9.5.3 Badger

A single badger sett was discovered during the badger survey on the 30th of October 2024. The Sett is classified as an ‘Outlier Sett’ due to the absence of other entrances, lack of spoil outside the hole and its inactive state. The location of the sett in relation to the Site is displayed in Figure 11.19 below and the sett entrance is shown in Figure 17. The status of the sett is categorised as inactive due to the absence of fresh signs, with no fresh tracks or scat evident leading to the entrance. There was also a visible buildup of leaf litter which appeared to be undisturbed. Some plant species were present which are unlikely to be growing at the sett entrance if it were active in the recent past. Although the sett is unlikely to be currently occupied, it is possible that badger will use this sett at least occasionally as an outlier sett, separate from any main sett.

It is worth noting that mammal trails were identified close to the Sett (c.2m) (Figure 18). These were running in and north south direction through the southern boundary of the Site and are likely to be used by badger at least occasionally.



Figure 11.17. Badger Sett on Site



Figure 11.18. Mammal Trail in proximity to the Badger Sett

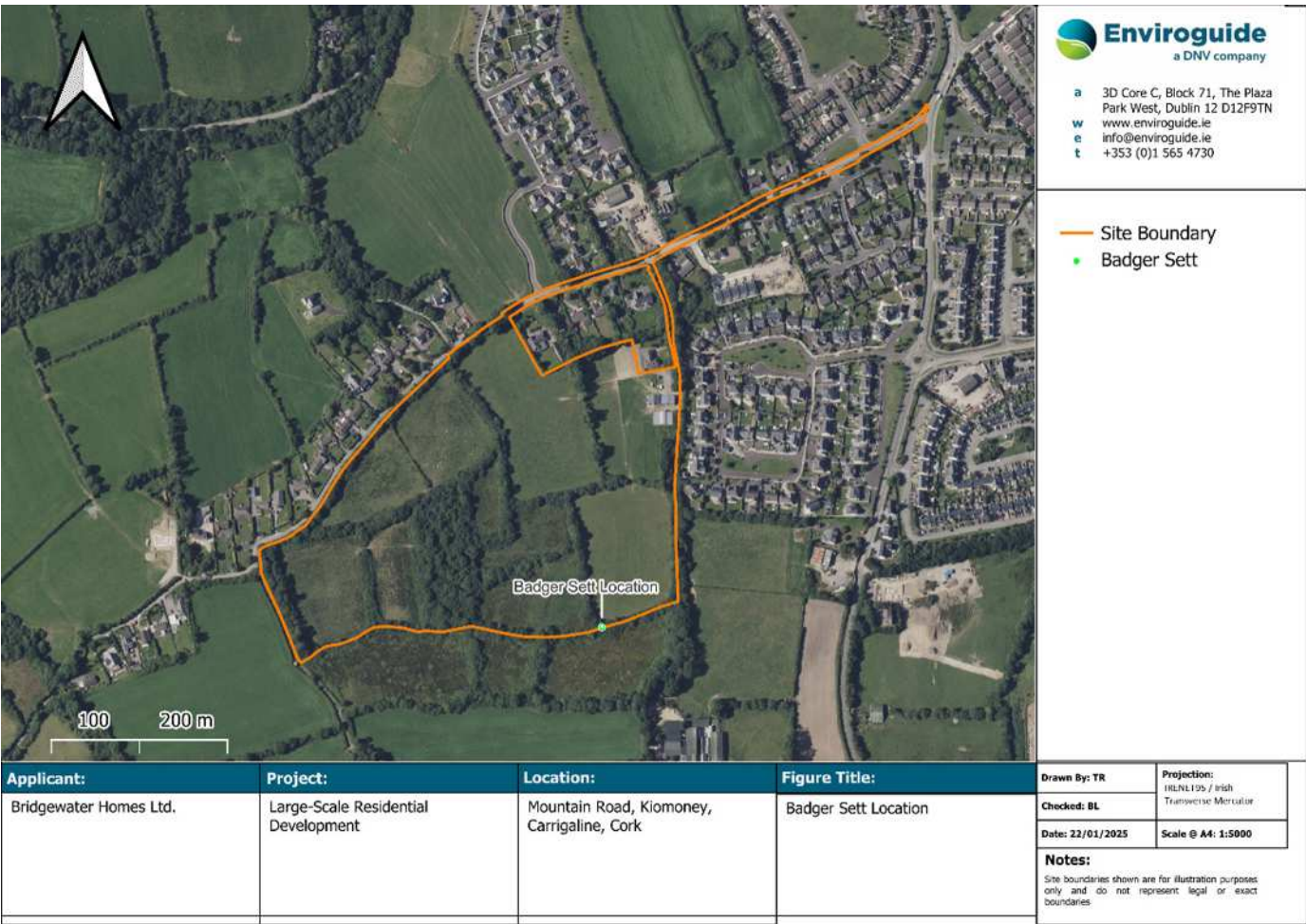


Figure 11.19. Badger Sett Location

11.9.6 Bats

11.9.6.1 Desk Study Results

A total of three bat species have been recorded within the W7161 1km grid square which encompasses the northern part of the Site (Table 11.8), while no bat records exist for the W7160 1km grid square encompassing the southern part of the Site. Records of common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Daubenton’s bat (*Myotis daubentonii*) were found.

In addition, the 10km grid square (W76) that encompasses the entire Site holds records for seven bat species (NBDC, 2025) (Table 11.9).

Table 11.8. Records of bats for the surrounding 1km Grid squares (W7160 and W7161) which encompass the Site (NBDC)

Species	Date of last record	Database	Designation
Common Pipistrelle (<i>Pipistrellus pipistrellus</i>)	26/06/2008	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Daubenton's Bat (<i>Myotis daubentonii</i>)	26/06/2008	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Leisler's bat (<i>Nyctalus leisleri</i>)	26/06/2008	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	26/06/2008	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)

Table 11.9. Records of bats for the surrounding 10km Grid square (W76) which encompasses the Site (NBDC).

Species	Date of last record	Database	Designation
Brown Long-eared Bat (<i>Plecotus auritus</i>)	31/08/2023	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Common Pipistrelle (<i>Pipistrellus pipistrellus sensu stricto</i>)	28/08/2018	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Daubenton's Bat (<i>Myotis daubentonii</i>)	30/08/2021	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Leisler's bat (<i>Nyctalus leisleri</i>)	15/06/2023	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Natterer's Bat (<i>Myotis nattereri</i>)	04/09/2008	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Pipistrelle (<i>Pipistrellus pipistrellus sensu lato</i>)	06/06/2022	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	28/08/2018	National Bat Database of Ireland	• EU Habitats Directive - Annex IV • Wildlife Act 1976 (as amended)

The Proposed Development Site (indicated in the black box in Figure 11.20) is located in an area with an overall Medium-High (29.56) suitability for bats in general. The suitability index for specific bat species is presented in Table 11.10. The landscape suitability index is high for four species of bats; Soprano Pipistrelle (*Pipistrellus pygmaeus*), Brown Long-eared Bat (*Plecotus auritus*), Common Pipistrelle (*Pipistrellus pipistrellus*) and the Leisler's Bat (*Nyctalus leisleri*).

Table 11.10. Landscape Suitability Index for individual bat species within the 2km Grid Square (Source: NBDC). Those species that have been recorded in the NBDC database within the W76 10km grid square are highlighted in green.

Bat Species	Suitability Index (2km Grid Square)
Soprano pipistrelle (<i>Pipistrellus pygmaeus</i>)	45 (High)
Brown Longed-eared bat (<i>Plecotus auritus</i>)	38 (High)
Common pipistrelle (<i>Pipistrellus pipistrellus</i>)	39 (High)
Lesser horseshoe bat (<i>Rhinolophus hipposideros</i>)	0 (Low)
Leisler's bat (<i>Nyctalus leisleri</i>)	39 (High)
Whiskered bat (<i>Myotis mystacinus</i>)	32 (Medium-High)
Daubenton's bat (<i>Myotis daubentonii</i>)	31 (Medium-High)
Nathusius' pipistrelle (<i>Pipistrellus nathusii</i>)	6 (Low)
Natterer's bat (<i>Myotis nattereri</i>)	36 (Medium-High)



Figure 11.20. Bat Landscape Suitability Model (All bats) surrounding the Proposed Development Site (Adapted from NBDC).

11.9.6.2 Field Survey Results

11.9.6.2.1 Habitat Appraisal

Habitats on Site were assessed during both the desk study in June 2024 and field survey in June 2024 for their ability to support foraging and commuting bats, as well as the Site’s connectivity to the wider landscape. A range of factors are considered in making this assessment according to Collins (2023), such as the connectivity of the Site to the wider landscape by means of treelines, hedgerows, and river corridors, the size, quality and species composition of treelines and hedgerows on Site, and the presence of any barriers to commuting for bat species.

It is determined that the Site provides 'moderate' suitability for foraging and commuting bats as per Collins (2023).

11.9.6.2.2 Preliminary Bat Roost Assessment

During the Site visit in June 2024, a preliminary bat roost assessment was conducted on all trees where relevant within the Site.

No notable roosting potential was observed on any of the trees on Site during the initial Site visit, or any subsequent Site visits. The buildings present within the study area are not considered suitable for roosting bats. Therefore, the Site was categorised as negligible potential.

11.9.6.2.3 Bat Habitat Suitability Assessment Survey

The presence of natural and semi-natural habitats on Site and on the edges are considered important to bats in a local context both for foraging and commuting. Due to the nature of the Proposed Development, areas of moderate importance for local bat species are almost entirely retained and will remain intact during the construction and operational phases of the Proposed Development, however the design of the Proposed Development in line with best practice and with adequate cognisance of nocturnal wildlife (including bats) will be important to the integrity of the current suitable habitat/ landscape.

11.9.6.2.4 Activity Surveys

Two dusk activity surveys were conducted at the Site. Weather was suitable for surveys according to the guidance outlined in Collins (2023) and is described in Table 11.11.

Table 11.11 Dusk Transect Survey Effort

Date	Sunset/Sunrise	Survey Start & End	Weather at start
12th of August 2024	21:00	20:58 23:46	Temperature: 18 C Wind: Beaufort 1 Rain: None
10th of September 2024	20:02	20:42 22:06	Temperature: 11 C Wind: Beaufort 2 Rain: None

It should be noted that the device used on the 10th of September was a batlogger Echometer Touch. The software used to analyse data from this device (Kaleidoscope Pro) does not provide GPS coordinates and so exact detection locations could not be displayed on a map as they could with the August transect. Similarly, the displayed transect route is an approximation. Given the presence of an experienced ecologist undertaking the survey and taking field notes, it is considered that an appropriate evaluation of the significance of the Site to bats could be carried out with the available data.

11.9.6.2.4.1 Walked Transect Survey 1 – 12th of August 2024

Activity was recorded throughout the Site with concentrations of bats located along linear features such as hedgerows and treelines. Bat passes and species composition for this survey are shown in Table 11.12 and Figure 11.21, respectively. A map of recorded bat activity and the transect route is shown in Figure 11.22.

Table 11.12. Summary of bat activity recorded on Site – 12th of August 2024

Species	Bat Passes
Leisler’s bat (<i>Nyctalus leisleri</i>)	23
Common Pipistrelle (<i>Pipistrellus pipistrellus</i>)	13
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	33
Brown Long-eared Bat (<i>Plecotus auritus</i>)	1

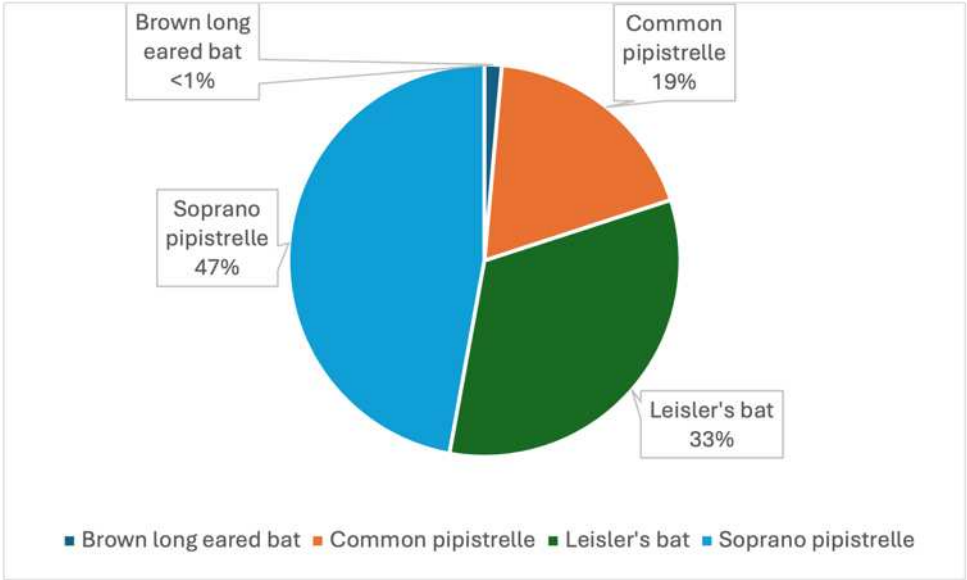


Figure 11.21 Species composition on the 12th of August 2024.

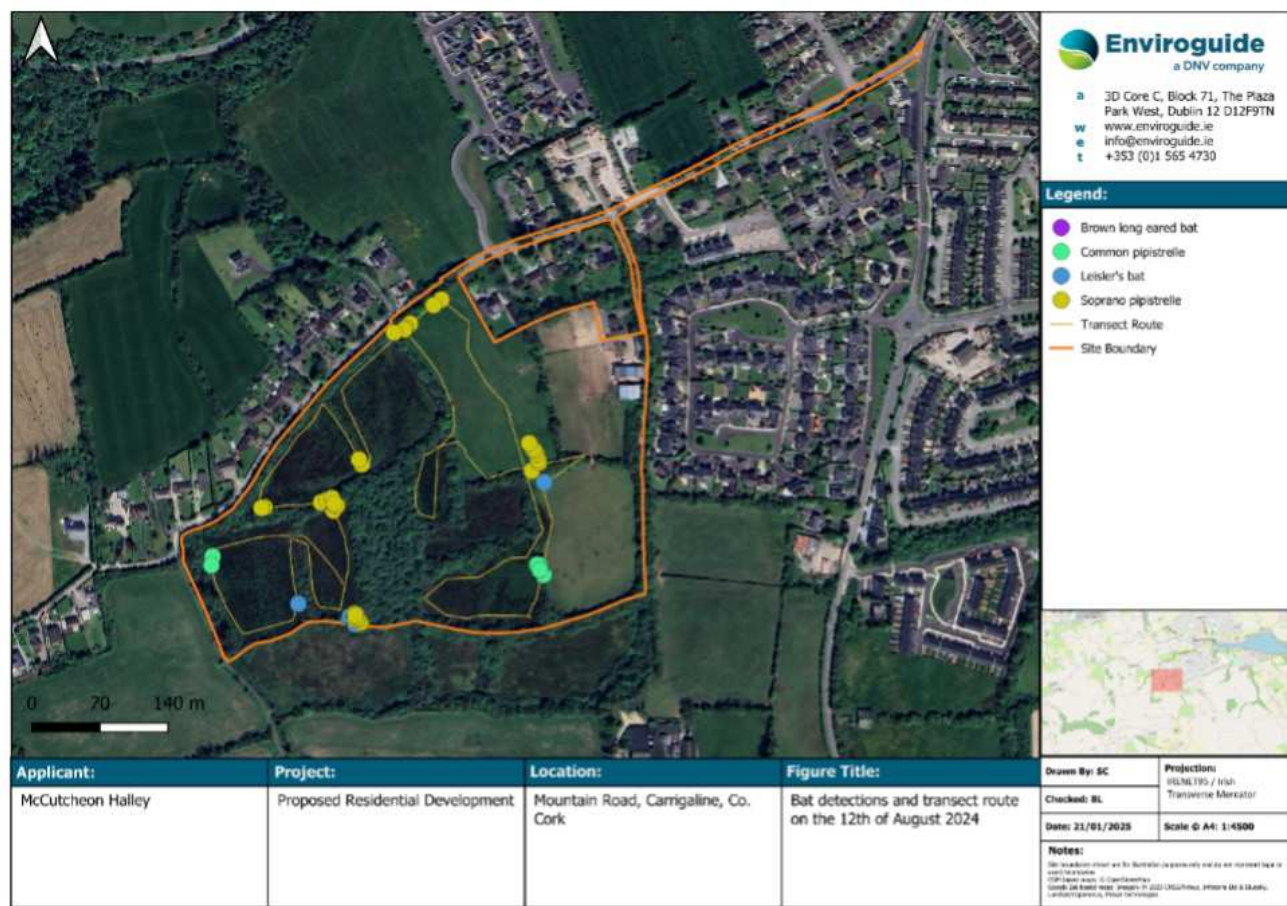


Figure 11.22. Bat activity and transect route on the 12th of August 2024.

11.9.6.2.4.2 Walked Transect Survey 2 – 10th of September 2024

Activity was recorded throughout the Site with concentrations of bats located along linear features such as hedgerows and treelines, according to field notes from surveying ecologist. Bat passes and species composition for this survey are shown in Table 11.13 and Figure 11.23, respectively. The approximate transect route is depicted in Figure 11.24.

Table 11.13. Summary of bat activity recorded on Site – 10th of September 2024.

Species	Bat Passes
Leisler's bat (<i>Nyctalus leisleri</i>)	2
Common Pipistrelle (<i>Pipistrellus pipistrellus</i>)	12
Soprano Pipistrelle (<i>Pipistrellus pygmaeus</i>)	24

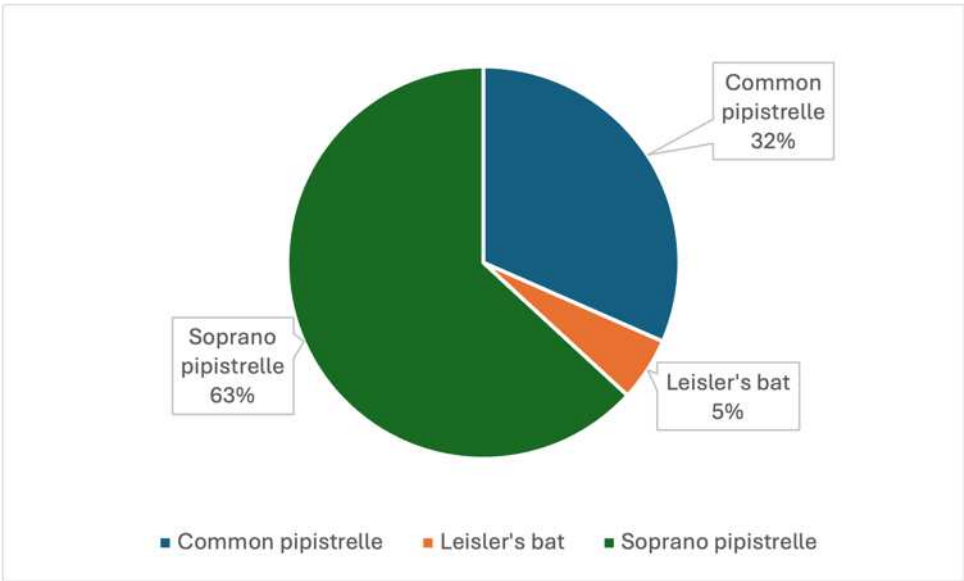


Figure 11.23. Species composition on the 10th of September 2024.

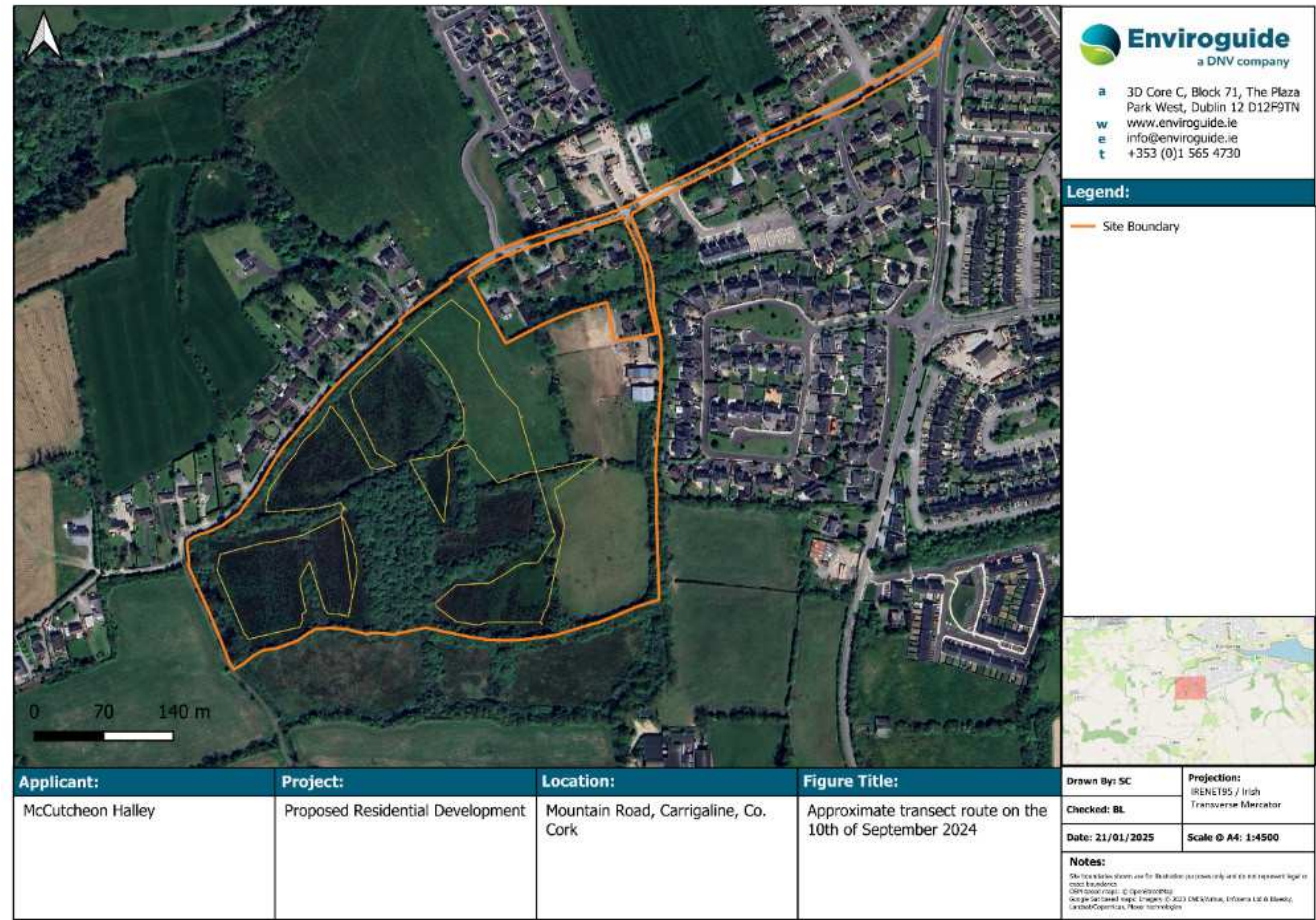


Figure 11.24. Approximate transect route (shown in yellow) on the 10th of September 2024.

11.9.7 Birds

11.9.7.1 Desk Study Results

A total of 38 bird species have been recorded within the W76A 2km grid square. Of these, 29 are green-listed, seven are Amber-listed, and nine are Red-listed according to Birds of Conservation Concern in Ireland 2020-2026 (Gilbert et al., 2021) (Table 11.14).

Table 11.14. Details of EU Annex I, BoCCI Amber and BoCCI Red-listed species recorded within the 2km grid square (W76A) (NBDC,2025)

Species Name	Date of Last Record	Title of Dataset	Conservation Status BoCCI, Birds Directive
Meadow Pipit (<i>Anthus pratensis</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Red List
Yellowhammer (<i>Emberiza citrinella</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Red List
Barn Swallow (<i>Hirundo rustica</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Amber List
Common Linnet (<i>Carduelis cannabina</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Amber List
Common Starling (<i>Sturnus vulgaris</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Amber List
European Greenfinch (<i>Carduelis chloris</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Amber List
Goldcrest (<i>Regulus regulus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Amber List
House Sparrow (<i>Passer domesticus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Amber List
Willow Warbler (<i>Phylloscopus trochilus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Amber List
Blackcap (<i>Sylvia atricapilla</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Blue Tit (<i>Cyanistes caeruleus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Chaffinch (<i>Fringilla coelebs</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Coal Tit (<i>Periparus ater</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Common Blackbird (<i>Turdus merula</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Common Bullfinch (<i>Pyrrhula pyrrhula</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Common Chiffchaff (<i>Phylloscopus collybita</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Common Pheasant (<i>Phasianus colchicus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Common Raven (<i>Corvus corax</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Common Wood Pigeon (<i>Columba palumbus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Eurasian Collared Dove (<i>Streptopelia decaocto</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Eurasian Jackdaw (<i>Corvus monedula</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Eurasian Sparrowhawk (<i>Accipiter nisus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Eurasian Woodcock (<i>Scolopax rusticola</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
European Goldfinch (<i>Carduelis carduelis</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
European Robin (<i>Erithacus rubecula</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List

Species Name	Date of Last Record	Title of Dataset	Conservation Status BoCCI, Birds Directive
Great Tit (<i>Parus major</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Hedge Accentor (<i>Prunella modularis</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Hooded Crow (<i>Corvus cornix</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Lesser Redpoll (<i>Carduelis cabaret</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Long-tailed Tit (<i>Aegithalos caudatus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Mistle Thrush (<i>Turdus viscivorus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Reed Bunting (<i>Emberiza schoeniclus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Rock Pigeon (<i>Columba livia</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Rook (<i>Corvus frugilegus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Sedge Warbler (<i>Acrocephalus schoenobaenus</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Song Thrush (<i>Turdus philomelos</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
White Wagtail (<i>Motacilla alba</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List
Winter Wren (<i>Troglodytes troglodytes</i>)	31/12/2011	Bird Atlas 2007 - 2011	BoCCI Green List

11.9.7.2 Preliminary Bird Survey Results

During the Preliminary Ecological Appraisal Site visit on the 4th of June 2024, a number of birds were recorded and assigned breeding status. These results have been combined with the Breeding Bird Survey results which were obtained from the Bird specific surveys undertaken on the 7th of August 2024. See Section 11.9.7.3 below with Table 11.15 and Figure 11.25 showing all target species records. Non-target species are outlined in Appendix 11.4

11.9.7.3 Breeding Bird Survey Results

A total of 23 bird species were recorded during breeding bird surveys, the majority of which were recorded within the Proposed Development area. Breeding activity was recorded for several common and Green-listed species (Appendix 11.4).

Four (4 no.) species of medium – high conservation concern were recorded during breeding bird surveys and are detailed in Table 11.15 and Figure 11.25 below.

Table 11.15. Breeding Bird Survey Results. Including results from Preliminary Ecological Appraisal Field Visit

GIS Code (Map Figure 13)	Species	Date	Time	BTO CODE	No.	Activity	Notes
MP 001	Meadow Pipit	04/06/2024	13:40	MP	2	Calling	Probable breeding
MP 002	Meadow Pipit	04/06/2024	13:50	MP	1	Flight	Possible Breeding
SI 001	Swift	04/06/2024	13:45	SI	3	Foraging	Non-breeding. Foraging high over Site for c.5 mins before travelling northwards
SL 001	Swallow	04/06/2024	13:55	SL	4	Foraging	Non-breeding. Foraging over fields
SL 002	Swallow	04/06/2024	15:45	SL	5	Flight	Non-breeding. Foraging over fields
SL 003	Swallow	07/08/2024	14:22	SL	4	Foraging	Non-breeding. Foraging over fields
WW 001	Willow Warbler	04/06/2024	13:35	WW	2	Song	Song. Probable breeding
WW 002	Willow Warbler	04/06/2024	14:00	WW	2	Song	Song. Probable breeding
WW 003	Willow Warbler	04/06/2024	15:00	WW	4	Song	Song. Probable breeding
WW 004	Willow Warbler	04/06/2024	16:00	WW	4	Song	Song. Probable breeding
WW 005	Willow Warbler	07/08/2024	14:10	WW	1	Song	Song. Probable breeding
WW 006	Willow Warbler	07/08/2024	15:00	WW	1	Song	Song. Probable breeding
WW 007	Willow Warbler	07/08/2024	15:30	WW	1	Song	Song. Probable breeding
WW 008	Willow Warbler	07/08/2024	16:15	WW	1	Song	Song. Probable breeding

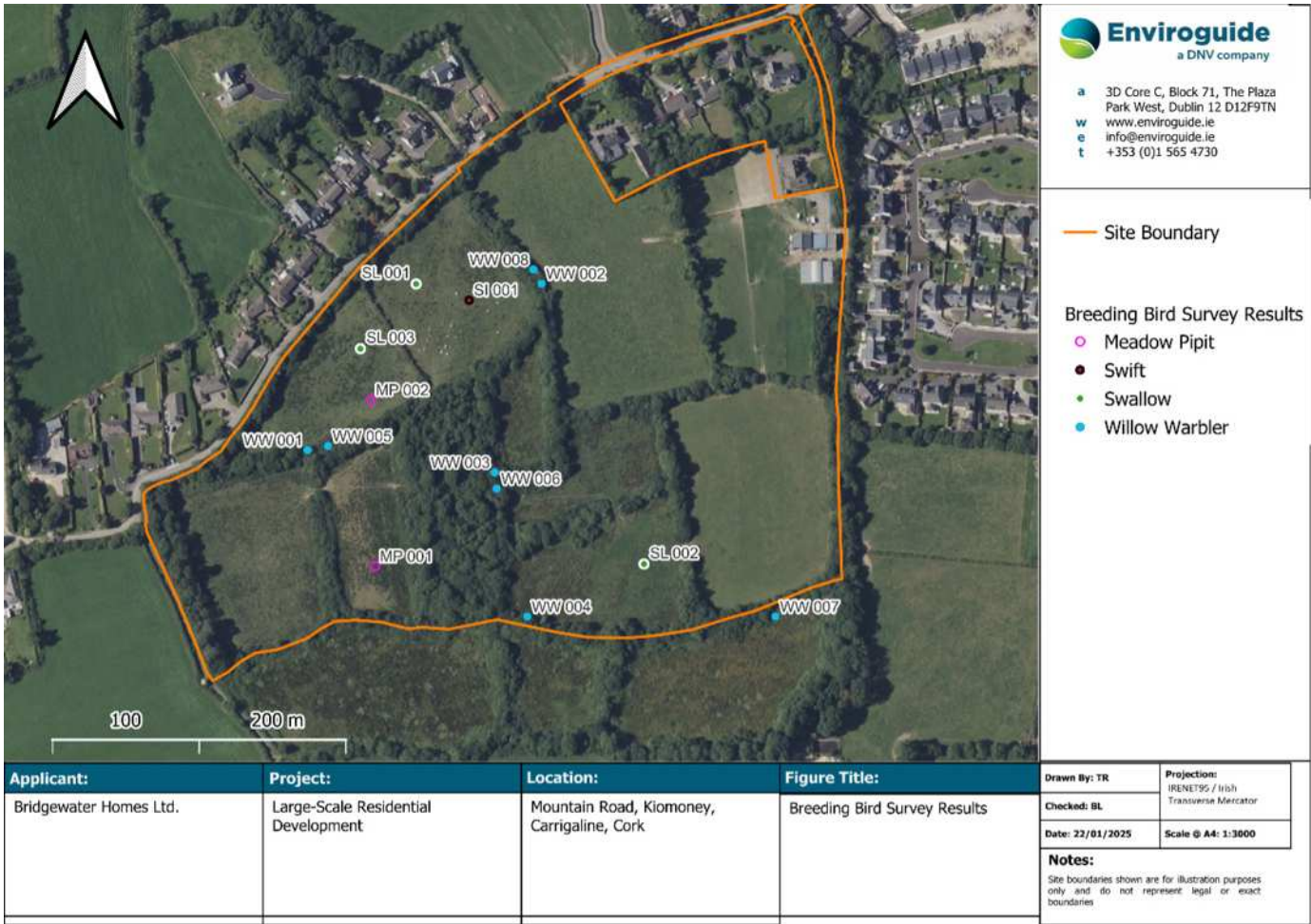


Figure 11.25. Breeding Bird Survey Observations

11.9.7.3.1 Meadow Pipit (*Anthus pratensis*) (BoCCI Red List)

Meadow pipit was recorded within wet grassland areas to the west of the Site. Breeding is probable in one area of grassland where alarm calling was observed in June 2024, this is consistent with breeding behaviour for the species. Records were confined to this general area with one bird observed in flight at the northwest of the Site.

11.9.7.3.2 Swift (*Apus apus*) (BoCCI Red List)

Swift was observed in a foraging flight over the Site in June 2024. The species is a non-breeder at the Site due to the absence of suitable breeding habitat but has been shown to forage in areas to the north of the study area. Three individuals were observed for a period of c. five minutes within the Proposed Development Boundary.

11.9.7.3.3 Swallow (*Hirundo rustica*) (BoCCI Amber List)

Swallows (max flock size c.5 individuals) were observed in June and August. Birds were observed in a low foraging flight over wet grassland areas of the Site on three occasions during the two Site visits. The species is a non-breeding species as there are no suitable area for this species to nest.

11.9.7.3.4 Willow Warbler (*Phylloscopus trochilus*) (BoCCI Amber List)

Willow warbler was regularly recorded on the woodland and hedgerows encompassing the Site. Breeding is considered probable in areas displayed in Figure 11.25, see also Table 11.15 above.

11.9.7.3.5 Summary of Other Bird Species Recorded

A total of five Green-listed species were confirmed as breeding on Site. These species included Reed Bunting (*Emberiza schoeniclus*), Blackbird (*Turdus merula*), Dunnock (*Prunella modularis*), Great Tit (*Parus major*) and Robin (*Erithacus rubecula*). Probable breeding status was assigned to a further seven common species including Wren (*Troglodytes troglodytes*), Goldcrest (*Regulus regulus*), Chiffchaff (*Phylloscopus collybita*), Chaffinch (*Fringilla coelebs*), Bullfinch (*Pyrrhula pyrrhula*), Blue Tit (*Cyanistes caeruleus*) and Blackcap (*Sylvia atricapilla*).

A further seven species were classified as possible breeders on Site. (See Appendix 11.4).

11.9.8 Other Fauna

11.9.8.1 Amphibians

Common Frog (*Rana temporaria*) was recorded in the 2km (W76A) grid square for the Site in 2011. Common Frog was also recorded historically in the broader area to the east of the Site. It is noted, however, that Smooth Newt (*Lissotriton vulgaris*) was not recorded within the 1km grid squares (W7160 & W7161) that encompass the Site (NBDC: Amphibians and reptiles of Ireland).

Drainage ditches are located on the Site periphery and in areas intersecting the study area. These drainage ditches are deemed suitable for breeding amphibians and are likely to support species such as common frog.

11.9.8.2 Reptiles

No Common Lizard (*Zootoca vivipara*) records exist for the relevant 2km grid square (W76A), however, there is potentially suitable habitat for this species located on Site. Common Lizard is associated with a broad range of habitats including scrub and wetland, particularly in Ireland (Herptological Society of Ireland (HSI,) 2025). It is therefore considered possible that common lizard could utilise the habitats on-Site within the confines of the wet woodland and riparian areas of the drainage ditches.

11.9.8.3 Fish

There are no waterbodies within the Site of the Proposed Development which could support notable fish species such as salmonids or lampreys. The nearby Kilnaglery River to the southeast and the Owenboy River to the west and north are both within c.350m of the Site boundary

11.9.8.4 Molluscs

There are no waterbodies within the Site which could support notable mollusc species. The nearby Kilnaglery River to the southeast and the Owenboy River to the west and north are both within c.350m of the Site boundary.

11.9.8.5 Invertebrates

No records for rare or protected species of invertebrates are available for the 2km grid square which encompasses the Proposed Development, nor were any recorded during the Site walkovers. There is negligible habitat present on Site to support common butterfly species, however the wet grassland area and woodland may support locally important populations of notable invertebrates.

11.9.9 Evaluation of Ecological Features

The value of the ecological features, i.e., the habitats and species present or potentially present, was determined using the ecological evaluation at different geographical scales (NRA, 2009), presented in Appendix 11.2. This evaluation scheme, with values ranging from locally important to internationally important, seeks to provide value ratings for habitats and species present that are considered ecological receptors of impacts that may ensue from a proposal. Based on best practice (CIEEM, 2018), any features considered to be less than of local value are not assessed within this EclA.

The impacts of the Proposed Development on the identified KERs are assessed in Section 11.10. Table 12 below summarises the evaluation rating assigned to each ecological feature and the rationale behind these evaluations is also provided.

Table 11.16. Evaluation of Designated Sites, Habitats, Flora and Fauna recorded within the Site and surrounding area. Those identified as Key Ecological Receptors (KERs) are highlighted in green.

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
Designated Sites			
Cork Harbour SPA (004030)	International Importance	Hydrologically linked to the Proposed Development via surface water channels and Ringaskiddy WWTP. Screened out in the AA screening report accompanying this application due to linear distance (1.5km) from the Site.	No
Owenboy River pNHA (001990)	National Importance	Hydrologically linked to the Proposed Development via surface water channels and Ringaskiddy WWTP. Screened out for significant effects by proxy due to overlap with Cork Harbour SPA, as per conclusions in AA Screening.	No
Lough Beg pNHA (001066)	National Importance	Hydrologically linked to the Proposed Development via surface water channels and Ringaskiddy WWTP. Screened out for significant effects by proxy due to overlap with Cork Harbour SPA, as per conclusions in AA Screening.	No

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
Monkstown Creek pNHA (001979)	National Importance	Hydrologically linked to the Proposed Development via surface water channels and Ringaskiddy WWTP. Screened out for significant effects by proxy due to overlap with Cork Harbour SPA, as per conclusions in AA Screening.	No
Cork Harbour Ramsar Site (Site ID: 837) & IBA	International Importance	Hydrologically linked to the Proposed Development via surface water channels and Ringaskiddy WWTP. Screened out in the AA screening report accompanying this application due to linear distance (5.7km) from the Site.	No
Habitats			
Wet willow-alder-ash Woodland	Local Importance (Higher Value)	A strip of woodland runs north to south in the centre of the Site. The area of woodland is c. 1ha. and is dominated by Willow (<i>Salix</i> sp.) with isolated areas of Ash (<i>Fraxinus excelsior</i>), and scrub dominating the outer periphery. The woodland contains a high proportion of mature Willow specimens with Ash also present. Woodland is of ecological value to a wide range of species.	Yes
Wet Grassland (GS4)	Local Importance (Higher Value)	Wet grassland encompasses a large proportion of the Site, c. 5.5ha of the western side of the Site is classed as wet grassland. The Wet Grassland areas on Site were dominated by <i>Juncus</i> sp. including Compact Rush (<i>Juncus conglomeratus</i>) and Soft Rush (<i>Juncus effusus</i>). The wet grassland areas hold a breeding bird territory to the west and are important for wildlife connectivity including small mammals throughout the Site.	Yes
Hedgerows (WS1)	Local Importance (Higher Value)	Hedgerows circulate the periphery and intersect the footprint of the Site. They are of very good ecological quality (i.e. tall, wide and largely unmanaged, supporting a greater variety of species when compared to narrow more intensively managed hedgerows), particularly on the western side and are 8-10m thick in some places with a variety of common species such as Bramble (<i>Rubus fruticosus</i>), Blackthorn (<i>Prunus spinosa</i>), Hawthorn (<i>Crataegus monogyna</i>), Honeysuckle (<i>Lonicera periclymenum</i>) and Gorse (<i>Ulex europaeus</i>), grading into wet grassland in most areas. Important in maintaining an ecological corridor through the Site.	Yes
Scrub (WS1)	Local Importance (Lower Value)	Areas of scrub are present at the edges of the hedgerows on the edges, and intersecting the Site. Scrub that has developed along the boundary of the Site and immediately off-Site comprise of common species including Bramble (<i>Rubus fruticosus</i>) and Gorse (<i>Ulex europaeus</i>).	No

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
Treelines (WL2)	Local Importance (Lower Value)	Treelines are present along the fringes of the Site. Species present included Ash (<i>Fraxinus excelsior</i>), Beech (<i>Fagus sylvatica</i>), Scots Pine (<i>Pinus sylvestris</i>) and Non-native and invasive Sycamore (<i>Acer pseudoplatanus</i>).	No
Drainage Ditches (FW4)	Local Importance (Higher Value)	Relatively low floral diversity and limited evidence of fauna use across this habitat but suitable areas of Amphibian habitat present and has capacity to support locally important populations of breeding common frog (<i>Rana temporaria</i>).	Yes
Improved Agricultural Grassland (GA1)	Local Importance (Lower Value)	Intensively managed grassland areas are of limited value ecologically.	No
Buildings and Artificial Surfaces	Negligible Value	The steel construction sheds are of limited value ecologically.	No
Adjacent and linked habitats			
Wet Grassland (ED2)	Local Importance (Higher Value)	Wet grassland of similar quality to that on-Site is present directly south of the Development Boundary. The areas are intersected by an existing drainage channel.	No
Hedgerows (WS1)	Local Importance (Higher Value)	Hedgerows of comparable quality to those located on-Site are present on the parcel of land directly south of the Development boundary.	No
Flora			
Rare & Protected Flora – Pennyroyal (<i>Mentha pulegium</i>)	National Importance	Records of Pennyroyal were made in 2017 (NBDC) in area c. 7.5km northeast of the Site. No signs or records of the species exists for the Site or adjoining areas. Screened out for effects due to distance.	No
Invasive Species	Negligible value	Limited stands that provide little ecological value including Sycamore (<i>Acer pseudoplatanus</i>) on the northern treeline.	No
Fauna			
Bats	Local Importance (Higher Value)	Moderate suitability habitat for foraging and commuting within the Site and the wider landscape. Negligible roosting potential on Site.	Yes
Badger	Local Importance (Higher Value)	The status of the sett is categorised as inactive due to the absence of fresh signs, with no fresh tracks or scat evident leading to the entrance. A disused outlier Sett, with the potential to be used in the future, and has clearly been used in the past by the species. Not a main Sett.	Yes

Species / Species Group	Evaluation	Rationale	Key Ecological Receptor (KER)
Wintering Bird Assemblages	Local Importance (Lower Value)	The Site contains enclosed areas of tall wet grassland, intensive agriculture areas to the west and areas of woodland, scrub and hedgerow. The Site is of importance to local assemblages of resident species with low potential for significant assemblages of migratory/ wintering species.	No
Breeding Bird Assemblages	Local Importance (Higher Value)	The Site was found to hold 23 bird species, including a probable breeding area for Red-listed meadow pipit and foraging, Red-listed Swift. Most bird species recorded on Site are Green -listed species and the Site is of local importance for these resident assemblages.	Yes
Hedgehog (<i>Erinaceus europaeus</i>)	Local Importance (Higher Value)	Suitable habitats present for these small native mammals on-Site within woodland, hedgerows and perimeter scrub.	Yes
Pygmy Shrew (<i>Sorex minutus</i>)			
Amphibians - Common Frog (<i>Rana temporaria</i>)	Local Importance (Higher Value)	Suitable habitats in areas of pooling water and in adjacent drainage ditch located off-Site.	Yes
Reptiles	Local Importance (Lower Value)	Suitable habitats within off-Site scrub and swamp habitats. Absence of suitable basking areas making the Site sub-optimal in its current state for common lizard.	No
Fish	Imperceptible	No suitable habitat on-Site or in areas adjacent. Suitable freshwater habitats are present in off Site rivers and streams outside the zone of influence of the Proposed Development.	No
Molluscs	Imperceptible	No suitable habitat on-Site or in areas adjacent. Suitable freshwater habitats are present in off Site rivers and streams. outside the zone of influence of the Proposed Development.	No
Invertebrates	Local Importance (Higher Value)	Suitable habitats within On-Site woodland, scrub and wet grassland habitats for notable species.	Yes

11.10 Ecological Impact Assessment

11.10.1 Avoidance and Mitigation Embedded in the Project Design

The Proposed Development includes several embedded design features that may act to avoid or mitigate negative impacts that would likely occur in the absence of these features. However, as opposed to typical mitigation measures,

the implementation of these features is integral to the design and completion of the Proposed Development, and as such the impact assessments are performed with consideration of these features as integrated parts of the Proposed Development. All considered embedded design features that may act to mitigate negative impacts on local ecology and environment are listed in Table 13.

Table 11.17. Embedded Design Features and their potential to act to avoid or mitigate negative impacts on the local ecology and environment.

Embedded Design Feature	Avoidance / Mitigation Potential
Surface Water Management (SuDS Measures) • Petrol Interceptors • Swales • Bioretention Raingardens • Tree Pits • Permeable Paving • Cellular Attenuation System • Wetlands and Ponds	The SUDS features included in the Project Design will ensure the surface water discharge from the Proposed Development is reduced to greenfield runoff rates. These features will be implemented as part of the surface water drainage design.
Landscape Design: • Inclusion of lawns and meadow grassland. • Minimal vegetation removal incorporating existing woodland areas. • Native tree and shrub planting	Accounting for the listed design features, the retention of the mature hedgerows and woodland on Site, the Proposed Landscape Plan is expected to have an overall positive impact on a local scale.
Construction Site Best Practice: • Compound facilities and parking • Traffic management • Material storage zone • Road cleaning • Resource and waste management plan • Sediment and water pollution control measures • Biodiversity protection measures • Dust control measures and best practice • Noise and vibration control best practice Operational Phase Mitigating Features: • Appropriate foul water treatment Off-Site at a plant with adequate capacity at Ringaskiddy WWTP. • Operational Phase Lighting in line with best practice for nocturnal wildlife	A range of measures are outlined in the CEMP which mitigation and minimise the likelihood of any pollution or negative effects on the environment resulting from the construction phase.

The below Sections assess the potential impacts on the previously identified KERs of the Site and immediate surrounds during the Construction and Operational Phases of the Proposed Development. The KERs identified are described in Section 11.9.9 above.

11.10.2 Construction Phase

11.10.2.1 Impacts on Habitats and Flora

The habitats on Site and in the adjacent environs considered as KERs (NRA, 2009) will remain intact during the construction phase of the development with little or no removal of the boundary habitats and peripheral hedgerows, woodland, treeline and scrub areas. A significant proportion of the wet grassland area will however be lost. The habitats with the potential to be affected during construction are listed and discussed below.

11.10.2.1.1 Wet willow-alder-ash Woodland

The landscape plan (SRLA, 2025) factors in the creation of a public walkway through the woodland area. The interventions required to construct this walkway are to be minimal, with narrow walkways and public lighting which is wildlife friendly proposed. It is worth noting that the existing woodland area contains worn pathways which have been used by livestock for many years. It is anticipated that minimal tree removal will be required and that the arboriculture plan (Arbocare, 2024) will be incorporated into the construction and design of this area in order to minimise habitat loss and disturbance to this ecologically valuable habitat. Effects on this habitat during the construction phase are assessed as **negative, slight** and **long-term**.

11.10.2.1.2 Wet Grassland (GS4)

Located on large areas of the Site, this habitat is of local importance – higher value. The majority of wet grassland will be lost due to the nature of the development, with no alternative to habitat loss. The effect on this habitat during the construction phase of the development is assessed as **negative, significant** and **permanent**.

11.10.2.1.3 Hedgerows (WS1)

A loss of a portion of hedgerow to the west of the Site area is required to facilitate the Proposed Development. An assessment of the quality and an appraisal of the current hedgerows will be carried out prior to works in order to quantify the effect of hedgerow removal on the overall ecological value of these habitats to the overall Site. It is anticipated that in combination with the proposed landscape plan which incorporates extensive native hedgerow planting and inclusion of native hedgerow species, there will be a net gain of ecological value to hedgerows resulting from the Proposed Development. The effects arising to hedgerows as a result of the construction phase is assessed as **positive, slight** and **long-term**.

11.10.2.1.4 Drainage Ditches (FW4)

The existing Site drainage channels will be upgraded during works, resulting in interference with the current habitats which are deemed to be suitable for amphibians such as Common Frog. Surveys prior to works during the appropriate season will identify areas (if any) where amphibians are present and works carried out at an appropriate time of year in such areas. In the absence of pre-construction surveys, works could proceed on important amphibian areas therefore the effects on drainage channels during the construction phase is assessed as **negative, significant** and **long-term**.

11.10.2.1.5 Impact on Breeding Bird Assemblages

One Meadow pipit breeding area was identified during breeding bird surveys in areas of wet grassland which will be largely lost as part of the Proposed Development. The loss of this breeding area is unlikely to be replaced by planting

or landscape enhancement due to the breeding requirements of the species. Effects on other breeding areas within removed hedgerows will be **imperceptible** to the overall population of meadow pipit. The landscape plan and hedgerow management will enhance the overall Site to a net gain of breeding areas for common bird species. Impacts on breeding bird assemblages during the construction phase is assessed as **negative, slight** and **long-term**.

11.10.2.2 Impact on Non-volant Mammals (excl. bats)

11.10.2.2.1 Badger

An outlier badger sett was identified during badger surveys in September 2024. In the absence of mitigation, effects arising due to construction activity within 30m of the sett entrance could have impact on badgers, should they be present during works. In the absence of appropriate timing of works and pre-construction surveys in line with TII guidance, effects resulting from the construction phase are assessed as **negative, moderate** and **short-term**.

11.10.2.2.2 Other small mammals.

Hedgehog and Pygmy Shrew are species likely to be associated with scrub and woodland which is present on-Site. No hedgehogs were observed on-Site during any of the Site visits in 2024 but they are likely to be present within these areas. The effect on hedgehog and other small mammals such as Irish Stoat and Pygmy Shrew during the construction phase of the development is assessed as **negative, slight** and **short-term** due to potential for entrapment, injury or death resulting from construction activities.

11.10.2.3 Impact on Amphibians

Suitable habitats for amphibians are present within the drainage channels on Site. In the absence of mitigation, construction phase impacts are assessed as **negative, moderate** and **short-term** provided works are carried out in the appropriate season.

11.10.2.4 Impact on Invertebrates

Invertebrates are associated with the terrestrial environments and any habitat loss is likely to have an impact on this species group. The loss of wet grassland will have an effect on invertebrates associated with this habitat. Effects arising will be offset by the proposed landscape plan and planting regime which includes native grassland. Effects on invertebrates during the construction phase are assessed as **negative, slight** on the **short-term**, however after a period of establishment of the newly landscaped areas the **long-term** effect is expected to be **positive, slight**.

11.10.2.5 Impact on Bat Assemblages

As outlined in the CEMP (OSL, 2025a) accompanying this application, construction works will typically be confined to daylight hours and night-time lighting will therefore not be required during the Construction Phase of the Proposed Development. However, where portable lighting is required, there is potential for a **negative, short-term, moderate** impacts to local bats due to potential increased lighting associated with the Construction Phase of the Proposed Development, particularly if inadvertently directed to the linear vegetation bounding the Site. Therefore, increased levels of lighting during the Construction Phase may deter bats from commuting and foraging within the vicinity of the Site.

There will be a loss of foraging and commuting habitat for local bats through the removal and fragmentation of trees, linear vegetation and grassland habitats on Site. Hedgerows can provide feeding resources and navigational features for bats, particularly

species such as common pipistrelle and soprano pipistrelle that tend to avoid crossing open areas (Marnell, Kelleher & Mullen, 2022). As such, the loss of sections of hedgerow and linear features will result in a **negative, permanent, moderate** effect on bats at a local scale. Mitigation measures are outlined in section 11.11 below.

11.10.3 Operational Phase

11.10.3.1 Impacts on Habitats and Flora

11.10.3.1.1 Wet willow-alder-ash Woodland

The landscape plan (SRLA, 2025) factors in the creation of a public walkway through the woodland area. The interventions required to construct this walkway are to be minimal, with narrow walkways and public lighting which is wildlife friendly is proposed. The resulting walkways will result in an increase in anthropogenic pressures including noise and disturbance during the operational phase. Effects on this habitat during the Operational Phase are assessed as **negative, slight and long-term**.

11.10.3.1.2 Wet Grassland (GS4)

Located on large areas of the Site, this habitat is of local importance – higher value. The majority of wet grassland will be lost due to the nature of the development, with no alternative to habitat loss. Remaining areas of wet grassland will remain in smaller quantities on the Site periphery, effects during the Operational Phase of the Proposed Development is assessed as **negative, slight and permanent**.

11.10.3.1.3 Hedgerows (WS1)

Increased human disturbance and slight alteration of existing hedgerows is possible during the operational phase. This likelihood is increased by the volume of people likely to be present in the immediate area of the hedgerows and natural features surrounding the Site. Designated walkways incorporated into the landscape plan will negate these effects by providing clear pathways, minimising encroachment into natural areas. The effect on hedgerows during the Operational Phase is assessed as **negative, slight and long-term**.

11.10.3.1.4 Drainage Ditches (FW4)

The existing Site drainage channels will be upgraded during construction works. Remaining drainage channels (where present) may experience impacts from anthropogenic sources e.g littering and disturbance. Surface water management using SuDS measures will replace the current drainage channels, including the use of natural methods of water attenuation. The effects on remaining drainage channels during the Operational Phase is assessed as **negative, slight and permanent**.

11.10.3.1.5 Impact on Breeding Bird Assemblages

In relation to collision risk, as outlined by Martin (2011) birds are vulnerable to collision with objects that seem obvious or conspicuous to humans, such as buildings, and it is unclear as to why this occurs, even under conditions of apparent clear visibility. It is suggested that bird collisions may be the result of factors such as the use of binocular and lateral vision, making commuting birds periodically blind in the direction of travel. Birds are at highest risk from objects such as buildings when they protrude unnaturally above the surrounding natural vegetation. Some of the most at-risk groups (classified as ‘medium’ and ‘high’ collision risk species) include wader species; waterfowl such as geese, swan and duck species; and some raptor species. It is worth highlighting that none of these species were recorded on Site during breeding bird or other survey types in 2024 and impact on these species is therefore considered to be **imperceptible**.

Breeding habitats outside the wet grassland areas including woodland, scrub and treeline areas will remain largely intact during the operational phase, with enhanced planting regimes proposed as part of the landscape plan likely to provide further breeding and foraging opportunities for the resident bird species present on Site. There will however be increased human disturbance on public walkways. The impact on breeding bird assemblages during the Operational Phase is assessed as **negative, slight and long-term**.

11.10.3.1.6 Badger

An outlier badger sett was identified during badger surveys in September 2024. In the absence of mitigation, effects arising due to increased human pressures within the vicinity of the sett entrance could have impact on badgers using the sett and areas adjacent to the sett entrance. Effects resulting from the operational phase are assessed as **negative, moderate and long-term**.

11.10.3.1.7 Other small mammals.

Hedgehog and Pygmy Shrew are species likely to be associated with scrub and woodland which is present on-Site. No hedgehogs were observed on-Site during any of the Site visits in 2024 but they are likely to be present within these areas. The effect on hedgehog and other small mammals such as Irish Stoat and Pygmy Shrew during the operational phase of the development is assessed as **negative, slight and long-term** due to increased anthropogenic disturbance on Site.

11.10.3.2 Impact on Amphibians

Remaining drainage channels (where present) may experience impacts from anthropogenic sources e.g littering and disturbance. The planned measures for surface water treatment (SuDS) provides for the use of wetland planting, wet swales and water attenuation which are assessed as having a **positive, slight and permanent** impact on amphibians.

11.10.3.3 Impact on invertebrates

No potential impacts on invertebrates were identified to occur during the Operational Phase of the Proposed Development.

11.10.4 Do Nothing Impact

In the absence of the Proposed Development, the Site at Mountain Road, Kilmoney would likely remain in its current state as an agricultural land use with valuable habitats on the periphery and interspersing woodland. The continued management of the Site would likely maintain the existing biodiversity, providing suitable habitat for generally accepted common and widespread species.

11.10.5 Cumulative Effects

11.10.5.1 Summary

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.

A review of other off-site developments and Proposed Developments was completed as part of this assessment. The following projects and plans were reviewed and considered for possible cumulative effects with the Proposed Development.

11.10.5.2 Relevant Plans and Policies

The following plans and policies were reviewed and considered for potential in-combination effects with the Proposed Development.

11.10.5.2.1 Cork County Development Plan (2022-2028)

The Cork County Development Plan 2022-2028 has directly addressed the protection of European sites through specific Objectives and policies (MW-GO-02, MW-GO-03, MW-GO-13).

Objectives outlined in the County Development Plan specific to Carrigaline are listed below;

- CL-GO-02 – Development Boundary. New development should be sensitively designed to provide for the protection of natural features including river corridors, mature trees, wetlands, woodlands, Cork Harbour SPA and the Owenboy pNHA.
- CL-R-05 – Medium A density residential development to be accompanied by appropriate landscaping and to take account of biodiversity sensitivities. (Note that this objective is not directly related to the Proposed Development Site but is included to demonstrate that biodiversity is considered within the CDP in relation to the general Carrigaline area).

11.10.5.2.2 The Cork County Biodiversity Action Plan (2014-2019)

- Objective 1 – To review biodiversity information for County Cork and to prioritise habitats and species for conservation action.
- Objective 2 – To collect data and use it to inform conservation action and decision making.
- Objective 3 – To incorporate positive action for biodiversity into local authority actions and policy.
- Objective 4 – To promote best practice in biodiversity management and protection.
- Objective 5 – To facilitate the dissemination of biodiversity information.
- Objective 6 – To raise awareness of County Cork's biodiversity and encourage people to become involved in its conservation.

Note that this Action Plan has not been updated since its term, however the Planning Authority intends to commence the process of reviewing the County Biodiversity Action Plan within 12 months of the adoption of the County Development Plan.

No significant effects are expected to arise, either from direct or indirect sources during the construction or operational phases of the Proposed Development or in combination with the above plans and policies. Therefore, it is considered that there are no means by which the above could act in combination with the Proposed Development to cause likely significant effects on ecological features / sensitivities.

11.10.5.3 Existing Planning Permissions

As part of this assessment, other offsite developments and proposed offsite developments as detailed in Chapter 1 of this EIAR were reviewed and considered for possible cumulative effects with the Proposed Development.

The Proposed Development is estimated to provide an increase in both extent and variability of available habitats for local wildlife, offsetting some of the loss accrued by nearby developments (both permitted and planned).

It is considered that there is no potential for the Proposed Development to act in-combination with other permitted developments in the vicinity that could cause likely significant effects on any nearby KERs.

11.11 Avoidance, Mitigation, Compensation and Enhancement Measures

The following mitigation measures will be implemented as part of the Proposed Development and in line with the policy objectives of the Cork Biodiversity Action Plan (2014-2019), in order to minimise the potential impacts on the existing ecology as discussed in previous Section s.

11.11.1 Incorporated Design Mitigation

Green infrastructure is incorporated into the design of the Proposed Development. The inclusion of native species will enhance biodiversity overall with provision of native shrubs, trees and sustainable surface water drainage methods including a rain garden as outlined in the landscape strategy prepared by SRLA (2025).

11.11.2 Construction Phase Mitigation

11.11.2.1 Biodiversity Measures

The CEMP (OSL, 2025a) has a number of biodiversity specific measures relating to the construction phase. The document states the following to protection to biodiversity.

"All site clearance and landscaping works will comply with current legislative requirements and best practice. All retained trees that are within or close to the working wayleave of the proposed development will be protected in accordance with the requirements of British Standard BS5837:2012 Trees in Relation to Design, Demolition and Construction' – Recommendations, with protective fencing being installed around all trees to be retained, prior to commencement of development. The planting plans and landscaping proposals will ensure that no invasive species are introduced, either deliberately or inadvertently, to the site from imported materials or other activities. Any licence necessary will be obtained if there could be a significant disturbance of any protected species."

11.11.2.1.1 Badger Sensitive Construction Works

The badger sett described in Section 11.9.5.3 above will be considered prior to any works taking place on Site. The following measures will be taken to ensure that no adverse effects result from the Construction Phase on this outlier badger sett.

The below measures are required for all planned construction activity within 50m of the sett during the period November to June inclusive (breeding season), heavy machinery work within 30m during the non-breeding season (July – October inclusive), lighter machinery within 20m during the non-breeding season and hand digging within 10m during the non-breeding season (Figure 11.26).

Licencing will be required from the National Parks and Wildlife Service (NPWS) within the above distance zones during the above-stated time periods, should there be no alternative to works proceeding at sub-optimal times/ within buffer zones.

11.11.2.1.1.1 Pre-construction monitoring (No more than 10-12 months prior to construction works)

- 1. An inspection of the sett to check for fresh signs of occupancy.
- 2. Deployment of camera traps for a minimum of 2-3 weeks to confirm or otherwise that badgers are not present.
- 3. Soft blocking of the entrance to confirm that badgers are not present.
- 4. Temporary Hard Blocking / exclusion during the construction phase will then be carried out following the above measures, should badgers be confirmed to be absent from the Sett.
- 5. Re-opening of the disused Sett post construction.

Should badgers be confirmed as present within the sett the following measures will be put in place to safeguard any individuals resting within the burrow network under NPWS licence.

- 1. Temporary exclusion (July to November inclusive only, outside of the breeding season).
- 2. Temporary Sett Closure.
- 3. Temporary Hard Blocking / exclusion during the construction phase.
- 4. Re-opening of the Sett post construction.

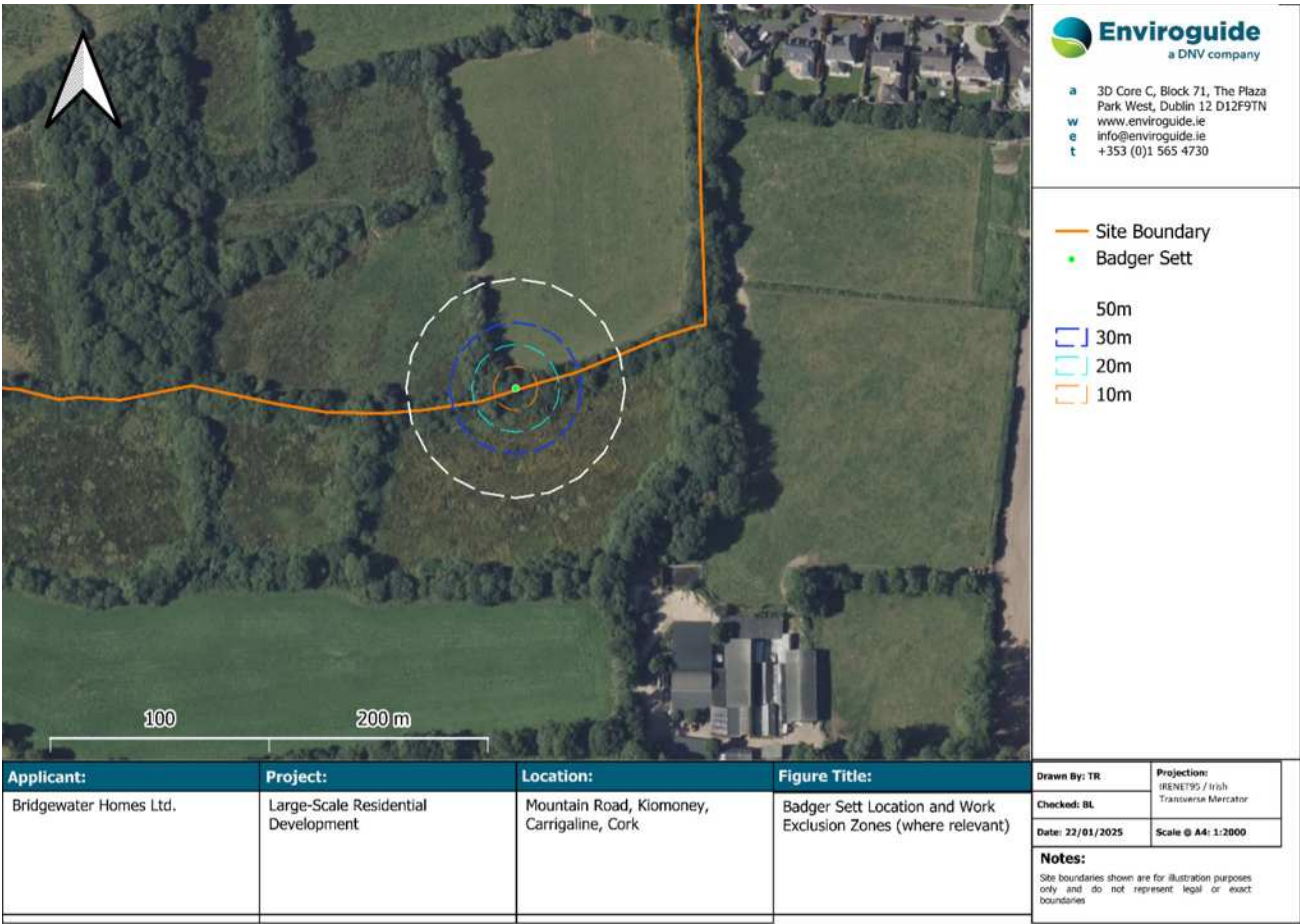


Figure 11.26. Badger Sett Buffer Zones

11.11.2.2 Surface Water Protection

Chapter 10 on Water (Enviroguide, 2025) which accompanies this application under separate cover states the following in relation to construction phase surface water mitigations

“During the Construction Phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP) (OSL, 2025a). These measures will address the main activities of potential impact which include:

- Control and Management of surface water runoff.
- Control and management of shallow groundwater during excavation and dewatering.
- Management and control of soil and materials.
- Appropriate fuel and chemical handling, transport and storage.
- Management of accidental release of contaminants at the site.
- Control and handling of cementitious materials.

The construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice. Good construction management practices will minimise the risk of pollution from construction activities at the subject site including but not limited to:

- Construction Industry Research and Information Association (CIRIA), 2001. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors.
- CIRIA, 2015. Environmental Good Practice on Site (C741).
- Enterprise Ireland Oil Storage Guidelines (BPGCS005).
- Environmental Protection Agency (EPA), 2013. IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities.
- CIRIA, 2007. The SuDS Manual (C697).
- UK Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG).
- CIRIA, 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648).
- Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.”

11.11.2.3 Timing of works and vegetation clearance

Works likely to cause disturbance to nesting birds at the eastern edge of the Site should be timed to take place outside the breeding bird season and in line with best practice i.e. during the period September – February inclusive.

Any clearance of scrub on-Site should take place during the same period (February to March inclusive) in line with the strict timing of vegetation clearance stated in the Wildlife Act 1976 and subsequent amendments. All treelines currently in place should be retained and reinforced with native species.

11.11.2.4 Construction Phase Lighting

Overnight lighting will be minimised as much as possible with any essential overnight lighting directed away from natural habitats along the boundaries of the Site (i.e., the woodland, hedgerows and scrub areas interspersing the Site). Where overnight lighting cannot be avoided in these areas due to health and safety concerns, the lighting within the Proposed Development will be designed and installed to minimise the impact on local wildlife and in accordance with the Bat Conservation Trust guidelines on artificial lighting and bats (BCT 2023):

- There will be no light spill to the boundary habitats.
- All luminaires used will lack UV/IR elements to reduce impact.
- LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability.
- A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum).
- Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats.
- Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible.
- Only luminaires with an upward light ratio of 0% and with good optical control will be used.
- Luminaires will be mounted on the horizontal, i.e. no upward tilt.
- Any external security lighting will be set on motion-sensors and short (1min) timers.
- As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed.

11.11.2.5 Waste Management

As best-practice, all construction-related rubbish on-site e.g., plastic sheeting, netting etc. should be kept in a designated area on-site and kept off ground level so as to protect small fauna (such as small mammals) from entrapment and death.

11.11.2.6 Pre-construction Amphibian Surveys

Pre-construction amphibian survey will be carried out at the appropriate time of year (April/May) to identify any areas where common frog may be spawning, with particular attention paid to all drainage ditches on Site which may hold water in early spring when amphibians breed. All records will be recorded and mapped; such areas will be cordoned off prior to works during the breeding season.

11.11.2.7 Pre-construction Hedgerow Appraisal Surveys and Quantification

An appraisal of the entire Site will be carried out in relation to hedgerows following the guidance set out by the Heritage Council Best Practice Guidelines (2013). The area of hedgerow will be quantified, with the hedgerow areas planned for removal as part of the Proposed Development quantified against the planned re-planting of native hedgerow included in the Landscape Plan. The hedgerow appraisal will determine the quantity of re-planting required in order to achieve a net gain of hedgerow habitat within the overall Development Area.

11.11.3 Operational Phase Mitigation

11.11.3.1 Badger Sensitive Screening and Landscape Design

Post construction or on completion of works within the predetermined buffer zone, the badger sett entrance will be re-opened, allowing for the re-use of the sett in the future and throughout the operational phase of the Proposed Development. The below measures will be put in place to avoid disturbance to the areas surrounding the Sett and to allow for free movement of badgers in the immediate area.

1. Public walkways, lighting and/ or public greenspace will be placed as far as practicably possible from the sett entrance.

2. A natural screen will be put in place to form a natural barrier between the public and the sett entrance at a minimum distance of 10m. This will be carried out using appropriate, densely vegetated native hedgerow species.
3. Soil bunding will be placed at a minimum distance of 10m radius from the sett entrance at a height of c.1-2m.

11.11.3.2 Surface Water Protection

Regular maintenance of surface water treatment facilities in accordance with best practice and manufacturers guidelines is required to keep the drainage system in adequate working order and to allow continued filtration of the surface water.

11.11.3.3 Landscape Management

Pollinators will be promoted through the management of the soft landscaping on-Site during the lifetime of the development, see landscape strategy prepared by SRLA (2025).

11.11.4 Biodiversity Enhancement Measures

11.11.4.1 Enhancement 1: Swift Bricks

Although there were no observations of swift breeding onsite during surveys, it is proposed to include swift bricks or external swift boxes on the western facades of the buildings as an enhancement measure. A minimum of 15 bricks/ boxes will be incorporated across the Development and will be installed a minimum of 5m off the ground. Care will be taken to ensure no obstacles or plate glass windows are located below the bricks/boxes.

Guidelines for the bird box scheme should follow guidelines published by Swift Conservation Ireland, and those published by Birdwatch Ireland entitled "Saving Swifts" (2019). The incorporation of swift bricks/boxes will help recover the declining swift population in the local area, which are now Red Listed in Ireland (Gilbert et al., 2021).

Swifts are a "clean" bird species which remove their own wastes from their nests periodically. As such, swift bricks/boxes do not require any cleaning by the management company.

A project ecologist will be instructed to oversee the installation of the swift bricks or boxes during the construction phase or after the development has been completed, depending on which option is decided upon by the design team.

11.11.4.2 Enhancement 2: Kestrel Nest Boxes

Kestrels have been regularly recorded in the past within the broader hinterland of the Site (NBDC, 2025). It is proposed to place two kestrel nest boxes (2 no.) in suitable areas on the edge of the Development area within retained treeline (Figure 11.27). The boxes will be placed at a minimum of 5-6m above ground and orientated towards open ground in area furthest removed from planned development. Kestrel is a Red-listed species on the Birds of Conservation Concern in Ireland (Gilbert et al., 2021).

A project ecologist will be instructed to oversee the installation of the boxes after the development has been completed and the boxes will be monitored in the years post construction.



Figure 11.27. Examples of suitable Kestrel Nest Box design

11.11.4.3 Enhancement 3: Bat Boxes

Common bat species were observed foraging on the site during the bat surveys. The wet woodland retained in the centre of the Site provides a good opportunity for bat habitat enhancement in the form of bat boxes. The boxes will provide roosting opportunities for local bat populations and help to increase the availability of suitable roost features in the area. A total of 3-5 bat boxes are recommended to be installed within the central woodland park in areas of low light and human disturbance.

These boxes will be erected under supervision of the project ecologist and monitored for bat activity in the years post construction.

11.11.4.4 Enhancement 4: Amphibian and Reptile Hibernacula

It is recommended to enhance the natural areas of the Site for amphibian and reptile use by providing suitable refuge and hibernacula around the attenuation areas. It is recommended that 2-3 areas of hibernacula are provided at the attenuation areas.

Hibernacula for amphibians and reptiles is relatively easy to create from rubble, wood and soil, all of which can likely be sourced from the Site during works. Rubble and wood in various sizes should be piled either in a shallow depression or on the slope of the attenuation pond in a disorganised way to create nooks and crevices. Larger tree trunks or rocks should be placed so that they will protrude through the final mound to provide open entrances to the mound. This pile should then be covered in soil to allow the inner crevices to maintain a stable temperature through the winter and allow for hibernation. The top can be planted with for example grass and native wildflowers. See Figure 11.28 for examples of finished hibernacula.



Figure 11.28. Examples of suitable amphibian and reptile hibernacula and refugia.

11.11.4.5 Enhancement 3: Bee Hotels

Nesting boxes designed for solitary bees will be installed within suitable areas of the Site, near areas of flowering meadows or within the central woodland.

Large bee or insect hotels will not be installed. Guidance from the All -Ireland Pollinator Plan states “Don’t install a large bee or insect hotel. Large bee hotels are attractive to humans, but not great for pollinators. They can encourage the spread of disease and attract predators. Avoid anything bigger than an average-sized bird box. There are many other ways to provide nesting habitats for pollinators, such as providing wild areas of undisturbed long grass, and scraping back some bare earth. If you want to make a bee hotel, make sure it is small, and position it away from bird feeders so the insects aren’t easy targets.” A link to a “How-to-guide Creating wild pollinator nesting habitat” is provided for the development management company to put these habitats in place: [How-to-guide-Nesting-2018-WEB.pdf \(pollinators.ie\)](#). An appointed ecologist will oversee the creation of these habitats.

11.12 Monitoring

Table 11.18 below provides a summary of the required monitoring and pre-works inspections during the Construction Phase, as well as any surveys that should be completed during the Operational Phase. The monitoring, inspections and surveys will ensure that the identified mitigation measures are implemented and maintained efficiently and have the desired effect of protecting the local ecology from adverse impacts.

The monitoring/surveys outlined below will be included in a Biodiversity Management Plan (BMP) for the Proposed Development, along with the detailed mitigation measures for the construction and operational phases (Sections 11.11.2 and 11.11.3) and Biodiversity Enhancement Measures (Section 11.11.4).

In addition to the items listed below, this document should detail the landscape management operations for the Proposed Development, including cutting/trimming regimes and maintenance of bird and bat boxes (if applicable). This document will also be updated to reflect any follow-up survey results as they are carried out. The BMP will be prepared and agreed in consultation with a suitably qualified ecologist and Cork County Council.

Table 11.18. Mitigation and enhancement measures during the construction and operational phase as well as enhancement measures to be carried out by a suitably qualified ecologist (represented in green).

Measure	Monitoring
Construction Phase	
Mitigation 1: Badger Sensitive Construction Works	Pre-construction monitoring (No more than 10-12 months prior to construction works) Badger exclusion and sett closure prior to works within sensitive areas
Mitigation 2: Surface Water Protection	Mitigations consistent with those set out in Chapter 10, Water of this EIAR and in accordance with the accompanying CEMP.
Mitigation 3: Timing of works and vegetation clearance	Vegetation clearance to take place outside the bird nesting season (September to February inclusive) and in line with construction best practice.
Mitigation 4: Construction Phase Lighting	Avoidance of light spill into sensitive habitats and avoidance of impacts to nocturnal wildlife as set out in Section 11.11.2.4 above.
Mitigation 5: Waste Management	Designated areas for waste to be kept off ground level for wildlife protection in line with best practice.
Mitigation 6: Pre-Construction Amphibian Surveys	Pre-construction surveys on Site and exclusion of breeding areas from construction activities during the breeding season.
Operational Phase	
Mitigation 7: Badger Sensitive Screening and Landscape Design	Sett re-opening. Natural screen and bunding. To be overseen by the project ecologist.
Surface Water Protection	Regular maintenance of surface water treatment facilities to ensure lifetime working operation.
Landscape Management	Pollinators will be promoted through the management of the soft landscaping on-Site during the lifetime of the development.
Enhancement	
Enhancement 1: Swift Bricks Installation	The location and placement of these structures should be carried out under the advisement and supervision of an Ecologist to ensure they are fit for purpose.
Enhancement 2: Kestrel Nest Boxes	2 no. Kestrel boxes to be placed in appropriate positions under Project Ecologist supervision.
Enhancement 3: Bat box Installation	The location and placement of these structures should be carried out under the advisement and supervision of an Ecologist to ensure they are fit for purpose.
Enhancement 4: Amphibian and Reptile Hibernacula	3 no. enhancement areas for amphibian and reptile around surface water attenuation areas.

11.13 Residual Impact Assessment

This Section assesses potential significant environmental impacts which remain after mitigation measures are implemented.

Standard construction phase control measures, and specific mitigation measures, have been outlined to ensure that the Proposed Development does not impact on any species, or habitats of conservation importance within the zone of influence of the Proposed Development. It is essential that these measures are complied with, in order to ensure that the Proposed Development complies with National conservation legislation. Provided all recommended measures are implemented in full and remain effective throughout the lifetime of the Proposed Development, no significant negative residual impacts on the local ecology, or on any designated nature conservation sites, will occur as a result of the Proposed Development.

Using sustainable surface water management and planting of native hedgerow, trees and shrubs it is reasonable to state that the residual impacts arising following the implementation of mitigation will be a net gain in biodiversity value when compared to the baseline conditions of the Site. This is due to the relatively low ecological value of the main Site footprint in its current form and considering the landscape design plan and planting strategy (SRLA, 2025).

The installation of artificial nest sites for Swift and Kestrel will provide nesting opportunities for up to ten (15 no.) pairs of Red-listed swifts and up to a minimum of two (2 no.) pairs of Kestrel (Red-listed). Bat boxes will enhance the area for roosting bats which have been recorded foraging over attenuation/ woodland and scrub areas of the Site. This residual impact will have a positive impact on the local population of both species and contribute to their recovery in the area.

11.14 Interactions

The potential significant impacts to Biodiversity have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

11.15 Conclusion

The assessment of potential adverse impacts resulting from the Proposed Development on biodiversity in this chapter has identified KERs including habitats and Fauna. It is reasonably considered that following all mitigation measures including design embedded and prescribed, adequate implementation of the CEMP, and adherence to construction best practice that no significant effects to biodiversity will arise from the Proposed Development during the construction or operational phases.

Additionally, the landscape plan for the Proposed Development and the prescribed maintenance and landscape strategy will provide enhancement to biodiversity in local area over the long term.

11.16 References and Sources

Heritage Council Hedgerow Appraisal Best Practice Guidelines (2013)

Bailey, M. and Rochford J. 2006. Otter Survey of Ireland 2004/2005. Irish Wildlife Manuals, No. 23.

National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

Molloy (2024) Outdoor Lighting Report – Mountain Road

Bang, P. and Dahlstrom, P. (2001). Animal Tracks and Signs, Oxford University Press, Oxford.

Bibby, C.J., Burgess, N.D., Hill, D.A. & Mustoe, S. 2000. Bird Census Techniques. Second Edition. Academic Press, London.

Bird Survey & Assessment Steering Group. (2024). Bird Survey Guidelines for assessing ecological impacts, <https://birdsurveyguidelines.org>.

Birdlife International – Data Zone LC Little Egret *Egretta garzetta*. [Online] available: <https://datazone.birdlife.org/species/factsheet/little-egret-egretta-garzetta/text>.

Birdwatch Ireland & National Parks and Wildlife Service (2012) CBS Manual: Guidelines for Countryside Bird Survey participants, available: [CBS Counter Manual - BirdWatch Ireland](#).

British Trust for Ornithology (BTO) (2024) Birdfacts - Key information about the UK's birds and their changing fortunes, based on data collected by BTO and partner organisations. Little Egret. [Online] available: Little Egret | BTO - British Trust for Ornithology.

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

DEHLG. (2010). Appropriate Assessment of Plans and Projects in Ireland - Guidance for Planning Authorities. Department of Environment, Heritage and Local Government.

Fossitt, J. A. (2000). A Guide to Habitats in Ireland. Kilkenny: The Heritage Council.

Gilbert, G., Gibbons, D.W., & Evans, J. (1998) Bird Monitoring Methods: A Manual of Techniques for UK Key Species. The Royal Society for the protection of Birds, Sandy, Bedfordshire, England.

Kazantzidis, S. and Goutner, V. (1996) Foraging Ecology and Conservation of Feeding Habitats of Little Egrets (*Egretta garzetta*) in the Axios River Delta, Macedonia, Greece. Department of Zoology, Aristotelian University of Thessaloniki GR-54006. Macedonia.

Marnell, F., Kelleher, C. & Mullen, E. (2022). Bat mitigation guidelines for Ireland v2. Irish Wildlife Manuals, No. 134. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

NRA (Now TII) (2009a) Guidelines for Assessment of Ecological Impacts of National Roads Schemes.

NRA (Now TII) (2009b) Ecological Surveying Techniques for Protected Flora & Fauna during the Planning of National Road Schemes.

NRA (Now TII) (2010). Guidelines on The Management of Noxious Weeds and Non-Native Invasive Plant Species on National Roads (now Transport Infrastructure Ireland), Dublin.

OPR (2021). Office of the Planning Regulator. Appropriate Assessment Screening for Development Management, OPR Practice Note PN01.

OSL Butler (2025a) Construction and Environmentla Management Plan (CEMP) – Mountain Road

OSL Butler (2025b) Infrastructure Design Report (IDR) – Mountain Road

Reid, N., Hayden, B., Lundy, M.G., Pietravallo, S., McDonald, R.A. & Montgomery, W.I. 2013a. National Otter Survey of Ireland 2010/12. Irish Wildlife Manuals No. 76. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Russ, J. (2012) *British Bat Calls: A Guide to Species Identification*. Pelagic Publishing, Exeter.

Smith, G.F., O'Donoghue, P, O'Hara K., and Delaney, E. (2010). Best Practice Guidance for Habitat Survey and Mapping. Published by the Heritage Council.

Birdwatch Ireland (2019) Saving Swifts. Department of Heritage Culture and the Gaeltacht, Ireland. [Online] available: [Saving-Swifts-Guide_pdf.pdf \(birdwatchireland.ie\)](#).

House Martin Conservation UK & Ireland (2021) Artificial nest cup installation guide. [Online] available: [HMCUK-IE_A5_Nest-cup-guide_Leaflet_2021.pdf \(housemartinconservation.com\)](#).

Herpetafauna Society of Ireland (2025) Common Lizard [Online] available: [Common Lizard – The Herpetological Society of Ireland \(thehsi.org\)](#).

CHAPTER TWELVE

NOISE & VIBRATION



CHAPTER TWELVE

Table of Contents

Noise & Vibration

12.1 Introduction..... 12-1

12.2 Expertise & Qualifications 12-1

12.3 Proposed Development..... 12-1

12.4 Methodology 12-1

12.5 Difficulties Encountered 12-4

12.6 Baseline Environment..... 12-4

12.7 The ‘Do Nothing’ Scenario 12-6

12.8 Characteristics of the Proposed Development..... 12-6

12.9 Potential Significant Effects 12-7

12.10 Mitigation Measures 12-11

12.11 Residual Impact Assessment 12-13

12.12 Risk of Major Accidents or Disasters 12-14

12.13 Interactions 12-14

12.14 Monitoring 12-14

12.15 Conclusion 12-14

12.16 References and Sources 12-14

Table of Tables

Table 12-1 Threshold of Potential Significant Effect at Dwellings	12-2
Table 12-2 Construction Noise Significance Ratings.....	12-2
Table 12-3 Recommended Construction Vibration Threshold for Control of Building Damage	12-3
Table 12-4 Guidance on Effects of Human Response to PPV Magnitudes	12-3
Table 12-5 Classification of Magnitude of traffic noise changes for Construction Traffic	12-3
Table 12-6 Likely Impact Associated with Change in Traffic Noise Level	12-4
Table 12-7 Guidance on Indoor Ambient Noise Levels for Dwellings	12-4
Table 12-8 Equipment used for Noise Monitoring	12-6
Table 12-9 Summary of Attended Noise Measurements at AT1	12-6
Table 12-10 Summary of Attended Noise Measurements at AT2	12-6
Table 12-11 Summary of Attended Noise Measurements at AT3	12-6
Table 12-12 Indicative Construction Noise Levels at Varying Distances	12-9
Table 12-13 Summary of Construction Phase Likely Significant Effects in the absence of mitigation.....	12-11
Table 12-14 Summary of Operational Phase Likely Significant Effects in the absence of mitigation.....	12-11
Table 12-15 Summary of Construction Phase Effects Post Mitigation ...	12-13
Table 12-16 Summary of Operational Phase Effects Post Mitigation.....	12-14

Table of Figures

Figure 12-1 Proposed Site Layout.....	12-5
Figure 12-2 Noise Monitoring Locations	12-5
Figure 12-3 Proposed Construction Phasing for Proposed Development.....	12-7
Figure 12-4 Identified NSLs during Construction.....	12-8

CHAPTER TWELVE | Noise & Vibration

12.1 Introduction

This EIAR Chapter has been prepared by AWN Consulting Ltd (AWN) to assess the potential noise and vibration effects of the proposed development in the context of current relevant standards and guidance.

This chapter includes a description of the receiving ambient noise climate 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. The assessment of direct, indirect and cumulative noise and vibration effects on the surrounding environment have been considered in this chapter.

A full project description is included in Chapter 2: Proposed Development, of this Environmental Impact Assessment Report (EIAR).

12.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Dominic Wright (Acoustic Consultant) who holds the Institute of Acoustics Diploma in Acoustics and Noise Control, along with a Diploma in Music Technology. With a background in audio engineering, he has over 3 years' experience working in the field of acoustics, contributing to various residential, industrial and infrastructure projects. He also has experience in both environmental noise surveying and modelling.

The chapter has been reviewed by Mike Simms (Principal Acoustic Consultant) who holds a BE and MEngSc in Mechanical Engineering, and is a member of the Institute of Acoustics and of the Institution of Engineering and Technology. Mike has worked in the field of acoustics for 20 years. He has extensive experience in all aspects of environmental surveying, noise modelling and impact assessment for various sectors including, wind energy, industrial, commercial and residential.

12.3 Proposed Development

The full description of the proposed development is outlined in Chapter 2 'Proposed Development' of this EIAR. In summary, the applicant seeks permission for the following Large Scale Residential Development (LRD) comprising the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

12.4 Methodology

12.4.1 Assessment Overview

The following methodology has been prepared based on the requirements of the Environmental Protection Agency (EPA) Guidelines the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022) and on AWN's experience of preparing the noise and vibration chapters for similar developments. The following approach has been used for this assessment:

- Baseline noise monitoring has been undertaken at the development site in order to characterise the existing noise environment;
- A review of relevant standards and guidelines has been carried out in order to set a range of acceptable noise and vibration criteria for the construction and operational phases of the proposed development;
- Predictive calculations have been performed to estimate the likely noise emissions during the construction phase of the proposed development at the nearest Noise sensitive Locations (NSLs) to the site;
- Predictive calculations have been performed to assess the potential effects associated with the operation of the proposed development at NSLs surrounding the site;
- An assessment has been completed of potential cumulative effects that may arise as a result of the proposed development and other existing or proposed plans and projects;
- A schedule of mitigation measures has been proposed, where relevant, to control the noise and vibration emissions associated with both the construction and operational phases of the proposed development.

12.4.2 Criteria for Rating of Impacts

The assessment has been undertaken with reference to the most appropriate guidance documents relating to environmental noise and vibration which are set out in the following sections. There are no statutory standards in Ireland relating to noise and vibration limit values for construction works or for environmental noise relating to the operational phase. In the absence of specific statutory Irish guidelines, the assessment has made reference to non-statutory national guidelines, where available, in addition to international standards and guidelines relating to noise and / or vibration impact for environmental sources.

In addition to specific noise and vibration guidance documents, the following EPA Guidelines the Information to be Contained in Environmental Impact Assessment Reports (EPA 2022) were considered and consulted in the preparation of this Chapter.

The significance of noise and vibration effects has been assessed in accordance with the EPA 2022 Guidelines. With regard to the quality of the effect, ratings may have positive, neutral or negative applications.

12.4.3 Assessment Criteria and Guidelines – Construction Phase

Local Authorities typically control construction activities by imposing limits on the hours of construction and consider noise limits at their discretion. Construction noise sources include construction plant and machinery and construction related traffic on surrounding roads. Reference is made to the following guidelines and standards to inform the most appropriate construction noise and vibration significance thresholds and assessment methodologies:

- 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+A1:2014 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);
- UK Highways England (now National Highways) (UKHE) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (hereafter referred to as DMRB Noise and Vibration) (UKHE 2020); and

12.4.3.1 Construction Noise

The British Standard BS 5228–1 (BSI 2014a) ‘ABC’ method is referenced here for the purposes of setting appropriate construction noise limits for the development. This is the most widely accepted standard for this purpose in Ireland.

The approach adopted calls for the designation of a noise sensitive location into a specific category (A, B or C) based on exiting ambient noise levels in the absence of construction noise. For the appropriate assessment period (i.e. daytime in this instance) the ambient noise level is determined and rounded to the nearest 5 dB. This then sets a threshold noise value that, if exceeded at this location, indicates a potential significant noise effect is associated with the construction activities, depending on context. Note that, in accordance with the BS5228-1 guidance, this assessment criterion is only applicable to residential receptors.

Table 12.1 sets out the construction noise thresholds (CNTs) at the façade of residential receptors for the different baseline noise categorises from BS 5228-1.

Table 12-1 Threshold of Potential Significant Effect at Dwellings

Assessment Category and threshold value period (L _{Aeq})	Threshold value, in decibels (dB)		
	Category A ^A	Category B ^B	Category C ^C
Daytime (07:00 – 19:00) and Saturdays (07:00 – 13:00)	65	70	75
Evenings and weekends D	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

- Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.
- Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.
- Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

12.4.3.2 Proposed Threshold Noise Levels

Taking into account the proposed documents outlined above and making reference to the baseline noise environment monitored around the development site (see section 12.6.1), BS 5228-1 has been used to inform the assessment approach for construction noise.

The following Construction Noise Threshold (CNT) levels are proposed for the construction stage of this development:

- For residential NSLs in proximity to the main site development works, Category A values are deemed appropriate using the ABC method.
- For commercial premises, the Category C value is considered an appropriate threshold value.
- There are no scheduled night-time construction works proposed as part of the proposed development.

14.4.3.3 Significance of Construction Noise Levels (CNL)

In order to assist with interpretation of significance relating a calculated construction noise level (CNL), Table 12-2 includes guidance as to the likely magnitude of impact associated with construction noise, relative to the CNT. This guidance is derived from DMRB: Noise and Vibration (UKHE 2020) and adapted to include the EPA EIAR Guidelines.

Table 12-2 Construction Noise Significance Ratings

Construction Noise Level per Period	Guidelines for Noise Impact Assessment Significance (DMRB)	EPA EIAR Significance Effects	Determination
Below or equal to baseline noise level	Negligible	Not Significant	Depending on CNT, duration & baseline noise level
Above baseline noise level and below or equal to CNT	Minor	Slight to Moderate	
Above CNT and below or equal to CNT +5 dB	Moderate	Moderate to Significant	
Above CNT +5 dB	Major	Significant, to Very Significant	

The adapted DMRB guidance outlined will be used to assess the predicted construction noise levels at NSLs and comment on the likely effects during the construction stage.

In accordance with the DMRB Noise and Vibration Guidance, construction noise and construction traffic noise effects shall constitute a significant effect where it is determined that a major or moderate magnitude of effect will occur for a duration exceeding:

- Ten or more days or night in any 15 consecutive day or nights, or
- A total number of days exceeding 40 in any six consecutive months.

12.4.3.4 Construction Vibration

Vibration standards come in two varieties: those dealing with human comfort and those dealing with cosmetic or structural damage to buildings. For the purpose of the proposed development, the range of relevant criteria used for surface construction works for both building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

Peak Particle Velocity (PPV) is a measure of the velocity of vibration displacement in terms of millimetres per second (mm/s). It is defined as follows within BS 7385-2 (BSI 1993) as ‘the maximum instantaneous velocity of a particle at a point during a given time interval’.

Building Response

There is no published statutory Irish guidance relating to the maximum permissible vibration level. The following standards are the most widely accepted in this context and are referenced here in relation to cosmetic or structural damage to buildings:

- British Standard BS 5228-2 (BSI 2014b); and
- British Standard BS 7385-2 (BSI 1993)

BS7385-2 (BSI 1993) and BS5228-2 (BSI 2014b) advise that, for soundly constructed residential properties and similar light-framed 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 frequency range of predominant pulse) of 15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz and 50 mm/s at 40 Hz and above for transient vibration. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in Table B.2 of BS5228-2 (BSI 2014b) might need to be reduced by up to 50%. On a cautious basis, therefore, continuous vibration limits are set as 50% of those for transient vibration across all frequency ranges. For buildings or structures that are structurally unsound, lower vibration magnitudes will apply, typically 50% of those for structurally sound buildings. Protected or historic buildings are not automatically assumed to be more vulnerable to vibration unless they have existing structural defects. The recommend transient vibration thresholds from BS5228-2 (BSI 2014b) for the avoidance of cosmetic damage to light framed and residential buildings are summarised in Table 12-3.

Table 12-3 Recommended Construction Vibration Threshold for Control of Building Damage

Allowable vibration (in terms of peak particle velocity) at the closest part of sensitive property to the source of vibration, at a frequency of: -		
Less than 15Hz	15 to 40Hz	40Hz and above
15mm/s	20mm/s	50mm/s

Human Response

Human response to vibration stimuli occurs at orders of magnitude below those associated with any form of building damage, hence vibration levels lower than those indicated in Table 12-3 can lead to concern. Table 12-4 presents the significance table relating to potential effects to building occupants during construction based on guidance from BS5228-2 (BSI 2014b), the DMRB Noise and Vibration (UKHE 2020) document and the associated EPA significant ratings.

Table 12-4 Guidance on Effects of Human Response to PPV Magnitudes

PPV range	BS 5228-2 (Note A, B, C)	DMRB Impact Magnitude	EPA Significance Ratings
≥10 mm/s PPV	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.	Very High	Very Significant
≥1 mm/s PPV	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents	High	Moderate to Significant
≥0.3 mm/s PPV	Vibration might be just perceptible in residential environments.	Medium	Slight to Moderate
≥0.14 mm/s PPV	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.	Low	Not significant to Slight
<0.14 mm/s PPV	Not perceptible	Very Low	Imperceptible to Not significant

Notes from BS5228-2:

- A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient.
- B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available.
- C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472 (BSI 2008), and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment.

12.4.3.5 Construction Phase Traffic Noise

Vehicular movement to and from the construction site for the proposed development will make use of the existing road network. In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced: DMRB Noise and Vibration (UKHE 2020) and the EPA Guidelines (EPA, 2022). For construction traffic, due to the short-term period over which this impact occurs, the magnitude of impacts is assessed against the ‘short term’ period in accordance with the DMRB Noise and Vibration (UKHE 2020) document.

Table 12-5 sets out the classification of changes in noise level to impact on human perception based on the guidance contained in these documents.

Table 12-5 Classification of Magnitude of traffic noise changes for Construction Traffic

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Short-term)	EPA Significance of Effect
Less than 1 dB	Inaudible	Negligible	Imperceptible
1 – 2.9	Barely Perceptible	Minor	Not Significant to Slight
3 – 4.9	Perceptible	Moderate	Moderate
≥ 5	Up to a doubling of loudness	Major	Significant

12.4.4 Assessment Criteria and Guidelines – Operational Phase

The main potential source of outward noise from the proposed development will be limited to traffic flows to and from the development site onto the public roads. There may also be an element of mechanical and electrical plant required to service the apartment buildings. The relevant guidance documents used to assess potential operational noise and vibration impacts on the surrounding environment are summarised below.

- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings (hereafter referred to as BS 8233) (BSI 2014c);
- BS 4142: 2014 +A1 2019 Methods for Rating and Assessing Industrial and Commercial Sound (hereafter referred to as BS 4142) (BSI 2019);
- 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);

- The UK Department of Transport Calculation of Road Traffic Noise (hereafter referred to as the CRTN) (UK Department of Transport 1988).
- UK Highways England (UKHE) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (UKHE 2020);
- International Organization for Standardization (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (hereafter referred to as ISO 9613 – 2) (ISO 1996);

12.4.4.1 Operational Phase Traffic Noise

Vehicular movement to and from the proposed development will make use of the existing road network and new junction arrangement. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to consider the increase in traffic noise level that arises as a result of any additional vehicular movements associated with the development.

In order to assess the potential impact of additional traffic on the human perception of noise, the following two guidelines are referenced DMRB Noise and Vibration (UKHE 2020) and the EPA EIAR Guidelines (EPA, 2022) which categorise the magnitude of effect relating to changes in road traffic. For the operational phase, traffic noise impacts are assessed against the ‘long term’ magnitude ratings from the DMRB. These are discussed in Table 12-6.

Table 12-6 Likely Impact Associated with Change in Traffic Noise Level

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact (Long-term)	EPA Significance of Effect
0	Inaudible	No impact	Imperceptible
0.1 – 2.9	Barely Perceptible	Negligible	Not significant
3 – 4.9	Perceptible	Minor	Slight, Moderate
5 – 9.9	Up to a doubling of loudness	Moderate	Moderate to Significant
10+	Doubling of loudness and above	Major	Significant to Very significant

12.4.4.2 Mechanical and Electrical Services Criteria

The proposed development is residential in nature. There will be minimal mechanical and / or electrical plant items required to service the development that will generate any audible noise levels outside of the site boundary or at the developments buildings themselves. Plant contained within enclosed plant rooms has the least potential for impact, once consideration is given to appropriate design of the space.

The closest noise sensitive locations to any operational plant items are the residential dwellings within the proposed development. To ensure there is no adverse impact on the future inhabitants of the proposed development itself, it is appropriate to refer to internal noise targets derived from BS 8233 (BSI 2014c). The recommended indoor ambient noise levels are set out in and are based on annual average data.

Table 12-7 Guidance on Indoor Ambient Noise Levels for Dwellings

Activity	Location	Daytime (07:00 to 23:00hrs)	Night (23:00 to 07:00hrs)	Derived External Levels
Resting	Living Room	35 dB L _{Aeq,16hr}	-	45 dB L _{Aeq,16hr}
Dining	Dining Room	40 dB L _{Aeq,16hr}	-	50 dB L _{Aeq,16hr}
Sleeping (daytime resting)	Bedroom	35 dB L _{Aeq,16hr}	30 dB L _{Aeq,8hr}	45 dB L _{Aeq,16hr} (40 dB L _{Aeq,8hr} at night)

The derived external levels are based on the approximate attenuation provided by a partially open window of approximately 15 dB, as advised in BS 8233, and represent the appropriate noise level at the external façade of the building. For the purposes of a conservative assessment an attenuation value of 10dB has been used to derive the external noise levels. Using this correction value, the following external noise levels would achieve the internal noise levels noted in Table 12-7 above.

- Daytime / Evening (07:00 to 23:00 hours) 45 dB L_{Aeq,1hr}
- Night-time (23:00 to 07:00 hours) 40 dB L_{Aeq,15min}

Once operational noise levels within the proposed residential units are controlled to within the design criteria discussed above, operational noise emissions to the surrounding environment will be minimal. The operational noise impact to the surrounding existing NSLs is therefore not significant.

12.4.4.3 Operational Phase – Vibration Criteria

There are no sources of vibration associated with the operational phase, therefore, vibration criteria have not been specified for this phase.

12.5 Difficulties Encountered

There were no significant difficulties encountered in compiling the specified information for this EIA chapter. The assessment has been completed using the information provided by the design team.

12.6 Baseline Environment

The site, which is 12.97 hectares in area, with a net developable area of 10.24 hectares, is located along Mountain Road, in the townland of Kilmoney, Carrigaline, Co. Cork.

The site is situated the south-west of Carrigaline, is within the settlement boundary of the town, and is located within 2km of the Main Street.

The area surrounding the lands comprise a mix of uses but are mostly residential and agricultural in character. There are a number of individual one-off dwelling houses located along Mountain Road, on both sides of the carriageway. To the south and west of the site are greenfield, agricultural lands, while to the east of the site is an existing farmyard. To the east of the southern portion

of the proposed development is the existing Wheatfields residential estate, which consists of mostly two-storey large, detached dwelling units. Figure 12-1 demonstrates the proposed site layout.



Figure 12-1 Proposed Site Layout

12.6.1 Baseline Noise Survey

An environmental noise survey has been conducted at the site in order to quantify the existing noise environment. The survey was conducted in general accordance with ISO 1996: 2017: Acoustics – Description, measurement and assessment of environmental noise. Specific details are set out below.

12.6.1.1 Choice of Measurement Locations

The measurement locations were selected to represent the noise environment at noise-sensitive locations surrounding the proposed development. The selected measurement locations are shown in Figure 12-2 and described as follows:

AT 1 – Attended Position representative of residential properties to the north of the site along Mountain Road

AT 2 – Attended Position representative of residential properties along Mountain Road.

AT 3 – Attended Position to the south of the site representative of the noise environment further into the site.



Figure 12-2 Noise Monitoring Locations

12.6.1.2 Survey Periods

Attended daytime noise measurements at locations AT1 to AT3 were conducted between 12:02 to 16:36 on the 5th of September 2024.

Weather conditions during the attended measurements were in the region of 14°C with wind speeds of below 5 m/s, the maximum wind speed at which the microphone windshield is effective.

12.6.1.3 Personnel and Instrumentation

AWN carried out all attended surveys. The following instrumentation was used in conducting the noise surveys:

Table 12-8 Equipment used for Noise Monitoring

Equipment	Type	Serial Number	Calibration Date
Sound Level Meter	Rion NL-52	186667	13/06/2023
Calibrator	B&K 4231	2394086	06/06/2024

12.6.1.4 Noise Measurement Parameters

The noise survey results are presented in terms of the following parameters:

- L_{Aeq} is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.
- L_{AFmax} is the instantaneous maximum sound level measured during the sample period using the ‘F’ time weighting.
- L_{A90} is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.

The “A” suffix for the noise parameters denotes the fact that the sound levels have been “A-weighted” in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pa.

12.6.1.5 Noise Survey Results

The results of the attended noise surveys at AT1, AT2 and AT3 are summarised in Table 12-9 to Table 12-11. It should be noted that a logarithmic average is used for the L_{Aeq} parameter, while an arithmetic average is used for the L_{A90} parameter.

Table 12-9 Summary of Attended Noise Measurements at AT1

Time	L_{Aeq}	L_{Amax}	L_{A90}
13:45	48	58	46
14:56	52	67	51
15:15	49	54	49
Average	50	54 - 67	49

The noise environment at AT1 during the daytime period was made up of local road traffic movements, bird song and rustling from foliage. Other noted noise sources included distant construction works. During the second measurement air traffic was also noted as being a contributing noise source. Ambient noise levels during the day were in the range of 48 to 52 dB $L_{Aeq,15 mins}$ and background noise levels were in the range of 46 to 51 dB $L_{A90,15mins}$.

Table 12-10 Summary of Attended Noise Measurements at AT2

Time	L_{Aeq}	L_{Amax}	L_{A90}
12:45	43	57	38
14:06	43	54	40
15:22	43	70	39
Average	43	54 – 70	39

The noise environment at AT2 during the daytime period was made up of local road traffic movements, bird song and distant construction works. Ambient noise levels during the day were in the range of 43 dB $L_{Aeq,15 mins}$ and background noise levels were in the range of 38 to 40 dB $L_{A90,15mins}$.

Table 12-11 Summary of Attended Noise Measurements at AT3

Time	L_{Aeq}	L_{Amax}	L_{A90}
14:08	44	65	39
15:17	43	57	40
16:36	45	59	42
Average	44	57 – 65	40

The noise environment at AT3 during the daytime period was made up of distant road noise, dogs barking and intermittent distant machinery being used. Ambient noise levels during the day were in the range of 43 to 45 dB $L_{Aeq,15 mins}$ and background noise levels were in the range of 39 to 42 dB $L_{A90,15mins}$.

12.7 The ‘Do Nothing’ Scenario

In the absence of the proposed project, the existing noise and vibration levels within the study area are expected to remain largely unchanged. The current baseline conditions characterised by the noise surveys within Section 12.6.1 will continue to prevail.

12.8 Characteristics of the Proposed Development

The proposed development comprises a mix of residential units and all associated site works. A full description of the development is available in included in Chapter 2: Proposed Development.

When considering a development of this nature, the potential noise and vibration impact on the surroundings must be considered for each of two distinct stages:

- the construction and demolition phase, and;
- the operational phase.

12.8.1 Construction Phase

The highest potential noise and vibration impact of the proposed development will occur during the demolition and construction phase due to the activity of mobile and construction plant items with high noise levels. The outline draft CEMP for the proposed development outlines various construction phases of different time frames. The Phase 1a site set up is due to occur over a 6-week period whilst the setting out of provisions of services is likely to take approximately 36 months. The construction of the residential units is anticipated to occur over 60 months. The effects from construction across this time period is deemed short term in nature.

During the construction phase, activities will involve site set up which will include site clearance and the demolition of the existing sheds to the north east of the site, the setting out site provisions of services works which will require extensive excavation and laying of sewers. Following this structural and building works associated with the residential units will be undertaken. For each stage there will be on-site plant and equipment operating in addition to construction traffic including movement of machinery and materials within and to and from the construction site. It is planned to construct the proposed development over 6 phases.

A variety of items of plant will be in use during these construction work all of which have the potential to generate high levels of noise. These will include excavators, loaders, dozers, cranes and static plant such as generators, compressors and pumps.

Vibration associated with the proposed construction site activities will be low due to the distance between the works and the nearest structures and buildings.

The potential impact associated with these above activities are discussed in the following sections.

12.8.2 Operational Phase

Once operational, there are no major noise sources associated with the proposed development which is residential in nature. The range of operational activities will be limited to local vehicle movements, amenity areas and Creche areas etc. None of these activities are associated with any significant noise effects to the surrounding noise environment. The main potential source of outward noise from the proposed development is associated with traffic flows to and from the development site on the surrounding road network. There will also be potential for an element of mechanical and electrical plant required to service plaza and creche within the centre of the proposed development.

12.9 Potential Significant Effects

12.9.1 Construction Phase

12.9.1.1 Closest NSLs and Noise Thresholds

The construction of the proposed development will occur over six construction phases. The proposed construction phasing program is highlighted below in as the works in each phase are completed the residential units within the completed phases, once occupied, will become NSLs.



Figure 12-3 Proposed Construction Phasing for Proposed Development

Figure 12-4 illustrates the location of the closest NSLs in the surrounding environment. These NSLs are also discussed below in relation to their position with the proposed development.

NSL1 – These NSLs are to the north of the proposed development along Mountain Road, they are approximately 15m from the redline boundary of the site and 45m from the closest structural works associated with the construction of residential units.

NSL2- These NSLs are to the east of the proposed development along Mountain Road and the residential properties within wheatfields further east. The closest of these NSLs is approximately 10m from the redline boundary of the site and 20m from the closest structural works associated with the construction of residential units.

NSL3- This NSLs are to the south of the proposed development in rural lands. It is approximately 135m from the redline boundary of the proposed development and 150m from the closest structural works associated with the construction of residential units.



Figure 12-4 Identified NSLs during Construction

The construction noise threshold is determined by referring to Table 12-1 (BS 5228-1) and the baseline ambient noise levels (as referred to in Section 12.6.1), as outlined in the assessment criteria section.

The standard working hours for the proposed development as outlined within the draft CEMP are as follows:

- Monday to Friday: 07:00 to 18:00hrs;
- Saturdays: 08:00 to 16:00hrs,

The draft CEMP also notes that it is not anticipated that work will be allowed to take place on Sundays and Bank Holidays. Should there be a requirement for works outside of the normal working hours a written submission seeking authorisation will be made to Cork County Council.

Based on the prevailing noise environment measured, the construction noise thresholds are defined from Category A as appropriate and defined within Table 12-1

Category A sets the following construction noise thresholds:

- Monday to Friday (07:00 – 19:00) 65 dB $L_{Aeq,T}$
- Saturdays (07:00 – 13:00hrs) 65 dB $L_{Aeq,T}$
- Evening and Saturday (13:00 – 23:00hrs) 55 dB $L_{Aeq,T}$

12.9.1.2 Source Noise Levels

Since the construction programme has been established in outline form, construction noise associated with activities on site during each construction phase are reviewed for the purposes of determining the likely significant effects. Indicative ranges of noise levels associated with construction may be calculated in accordance with the methodology set out in BS 5228-1. This standard sets out sound power and sound pressure levels for plant items normally encountered on construction sites, which in turn enables the prediction of noise levels.

Given that the construction stage is highly transient in nature and involves a number of various stages which will encompass a range of different activities on a day to day and week to week basis, it is not possible to calculate with a high degree of accuracy the specific levels of noise associated with each stage. The construction stage will be undertaken over a number of stages from site preparation and demolition of existing structures through to building construction and internal fit out. Expected typical levels of noise associated with the key stages of work are discussed below. For the purposes of this assessment the various phases of construction have been split into three distinct phases, the site set up and clearance works, the more noise intrusive provisions of services to the site and the general construction anticipated to take place on a development of this nature.

12.9.1.2.1 Site Set Up, Clearance and Demolition

For site set up and clearance the works will involve the removal of any vegetation within the site as well as the construction of a site office and compound. The provision of temporary foul and storm sewers will also be provided for the site office during this phase. In addition to this, the demolition of existing sheds to the northeast of the site will be removed. This will likely be the most noise intrusive works during this phase of construction. Reference to BS 5288-1 indicates that highest noise levels during this phase will be associated with activities associated with the demolition of existing structures, and ground clearance phase activities. Noise levels from these activity types are typically in the range of 80 to 90 dB L_{Aeq} at 10m.

For construction activities associated with demolition and surface ground clearance, a total construction noise level of 92 dB L_{Aeq} at 10m has been used for the purposes of indicative calculations. This would involve for example, one item of plant at 90 dB L_{Aeq} and two items of plant at 85 dB L_{Aeq} and one item of plant at 80 dB L_{Aeq} operating simultaneously within one work area which is considered a worst-case scenario.

12.9.1.2.2 Provisions of Services to the Site

For the provision of services to the site typical plant items will include excavators, loaders, dozers, concreting works, mobile cranes and generators. Noise source levels are quoted in the range of 70 to 80 dB L_{Aeq} at distances of 10 m within BS 5228-1. For the purposes of this assessment, a combined sound pressure level of 85 dB $L_{Aeq,T}$ at 10m has been used for construction noise calculations. This would include, for example, 2 no. items of construction plant with a sound pressure level of 80 dB L_{Aeq} at 10 m and 3 no. items of plant with a sound pressure level of 75 dB L_{Aeq} at 10 m, resulting in a total noise level of 85 dB L_{Aeq} at 10m along the closest works boundary.

12.9.1.2.3 General Construction

Once the ground preparation and foundation works have been completed, a large portion of the work will involve manual labour and cranes with lower overall noise levels. For the purpose of this assessment a combined sound pressure level of 78 dB $L_{Aeq,T}$ at 10m has been used for construction noise calculations during ongoing site works and compounds once site clearance and excavation works are completed. This would include, for example, one item of plant at 75 dB L_{Aeq} and three items of plant at 70 dB L_{Aeq} operating simultaneously within a work area resulting in a total noise level of 78 dB L_{Aeq} along the closest works boundary.

Given the nature of the proposed works which will include standard house and apartment building techniques across the site, a cumulative construction noise levels above represent conservative noise levels used to assess construction activities associated with the various stages of construction. This worst-case scenario is a robust assumption made for developments of this size, on the basis that it is unlikely that more than 5 no. items of such plant/equipment would be operating simultaneously in such close proximity to each other at all times. In reality items of construction plant and machinery will be operating at varying distances from any one NSL.

12.9.1.3 Construction Noise Calculations

Construction noise levels have been calculated at the closest NSLs, assuming the construction noise levels discussed above. For the purpose of the assessment, partial site screening (5 dB) has been assumed from the use of a standard site hoarding of 2.4 m high for noise sensitive boundaries. The calculations also assume that the equipment will operate for 66% of the working time over a construction working day. Table 12-12 summarises the result of this assessment.

Table 12-12 Indicative Construction Noise Levels at Varying Distances

Construction Phase	Cumulative Sound Pressure, dB $L_{Aeq,T}$ at 10m	Calculated Noise Levels at Varying Distances, dB $L_{Aeq,T}$						
		10m	20m	30m	40m	50m	100m	150m
Site Set Up, Clearance and Demolition	92	85	79	75	73	71	64	60
Provision of Site Services	85	78	72	68	66	64	57	53
General Construction	78	71	65	61	59	57	50	46

12.9.1.3.1 Site Set Up, Clearance and Demolition Noise

During the site set up phase the closest NSLs will be NSLs 1 and 2 to the north and north east of the site. The closest dwellings during this phase will be at distances of approximately 10m at the northeast of the site. The potential effect during the site set up and demolition phase at the properties closest to the construction works is likely to be temporary, negative and significant to very significant where the greatest impacts will occur during the demolition of the existing sheds to the northeast of the site.

Other existing NSLs are at varying distances, ranging from approximately 30m to 150m from the site setup and demolition works. At distances up to 50m, construction noise levels related to the site setup, clearance, and demolition phase will remain temporary, negative, and significant to very significant, falling to moderate to significant at distances beyond 50m up to 90m. At all NSLs beyond 90m, the construction noise level will fall within the adopted CNT. Reference to Table 12-2 determines the construction noise effect at these NSLs to be temporary, negative, and slight to moderate.

This assessment is highly conservative on the basis that the most noise intrusive activities will be taking place within 10m of the nearest NSLs. It is also conservative based on the noise intrusive demolition activities exceeding the durations for significance outlined within Section 12.4.3.3. If the durations of significance are not exceeded, then the resulting effect during this phase of construction will be not significant.

12.9.1.3.2 Provision of Site Services Construction Noise

During the provision of site services phase, it is predicted that significant works will be taking place. There is the likelihood of both excavation and rock breaking during this phase for the provision of the storm and foul services. The closest NSLs will be NSLs 1 and 2 to the north and east of the site. The closest dwellings during this phase will be at distances of approximately 10m. The impact during the this phase at the properties closest to the construction works is likely to be short term, negative and significant to very significant.

Other existing NSLs are at varying distances, approximately 30m to 150m, from the site services works. At distances from 30m to 50m, the impact will be short-term, negative, and moderate to significant. Beyond 50m, the impact will fall to slight to moderate, where the predicted construction noise level associated with the provision of site services is likely to fall below the adopted construction noise threshold.

12.9.1.3.3 General Construction Noise

During general construction works associated with the general construction of the residential units the activities can operate within the adopted CNT of 65 dB $L_{Aeq,T}$ at distances of $\geq 20m$. Reference to Table 12-2 determines the construction noise effect associated with general site works at the closest NSLs within 10m is short term, negative and significant to very significant reducing to short term, negative and slight to moderate at the remaining NSLs beyond 20m.

12.9.1.3.4 NSLs Within Proposed Development During Construction

During the construction of various phases of the proposed development, residential units from subsequent phases may be occupied. These units would, in turn, become the most affected NSLs as they will be closest to the construction works. Due to the phasing of the proposed project outlined within the draft CEMP, it is only deemed likely that NSLs within the development will be subject to the general construction noise detailed above. Where general construction occurs within 20m of residential NSLs within the proposed development, the effect will be temporary to short-term, negative, and significant to very significant, depending on the distance from the works. Where general construction occurs beyond 20 meters, the effect at residential NSLs within the proposed development will be short-term, negative, and slight to moderate.

12.9.1.4 Construction Phase – Vibration

The main potential source of vibration during the construction programme is associated with the groundbreaking or demolition activities.

During intermittent breaking activity at ground level, there is potential for vibration to be generated. Empirical data for this activity is not provided in the BS 5228-2 standard, however the likely levels of vibration from this activity is expected to be significantly below the vibration criteria for building damage based on experience from other sites. AWN Consulting have previously conducted vibration measurements under controlled conditions, during trial construction works on a sample site where concrete slab breaking was carried out. The trial construction works consisted of the use of the following plant and equipment when measured at various distances:

- 3 tonne hydraulic breaker on small CAT tracked excavator
- 6 tonne hydraulic breaker on large Liebherr tracked excavator

Vibration measurements were conducted during various staged activities and at various distances. Peak vibration levels during staged activities using the 3 Tonne Breaker ranged from 0.48 to 0.25 PPV (mm/s) at distances of 10 to 50m respectively from the breaking activities. Using a 6 Tonne Breaker, measured vibration levels ranged between 1.49 to 0.24 PPV (mm/s) at distances of 10 to 50m respectively. Whilst these measurements relate to a solid concrete slab, the range of values recorded provides some context in relation typical ranges of vibration generated by construction breaking activity.

Vibration magnitudes associated with this activity are well below those associated with any form of cosmetic damage to buildings. There is potential for a brief, negative and moderate impact for building occupants within 20m of this activity using a 6 Tonne Breaker or equivalent. NSLs to the north and east of the site are within this distance band and occupants may experience a brief, negative and moderate impact depending on the distance at which breaking takes place to the NSLs.

During the construction phase it is expected that the potential effect due to vibration will be brief, negative and moderate in the absence of mitigation at distances less than 20m, however at the majority of receptors the effect in relation to vibration will be short term, negative and not significant.

12.9.1.5 Construction Phase – Traffic

During the construction phase, traffic associated with the proposed development would consist of a mix of Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) travelling to and from the site.

In terms of the additional construction traffic on local roads that will be generated as a result of the proposed development, the following comment is presented: As stated in the DMRB Noise and Vibration (UKHE 2020), Volume 11, Section 3, Part 7, in order to increase traffic noise levels by 1 dB traffic volumes would need to increase by the order of 25% it is considered that additional traffic introduced onto the local road network due to the construction phase associated with various phases of the development will introduce a level of traffic that will not result in a significant noise impact. However, a series of mitigation measures within section 12.10 will be implemented to ensure that noise from vehicle movements during construction are reduced to a minimum.

12.9.2 Operational Phase

12.9.2.1 Mechanical Plant and Services

There are no significant sources of mechanical or electrical plant associated with the building types across the proposed development with potential to emit audible noise levels beyond the buildings themselves. (i.e., individual heat recovery systems serving the residential units where proposed). Any plant rooms required to serve the proposed plaza and creche will be enclosed. Any required plant items serving development buildings will be designed and located so that there is no negative impact on sensitive receivers within the proposed development itself.

In this instance, best practice is to set appropriate noise limits that will inform the detailed design during the selection and layout of building services for the proposed development. The operational noise level from any building services plant at the nearest residences within the proposed development will be designed/attenuated to not exceed the external noise levels discussed in Section 12.4.4.2 to ensure no negative noise impacts occur within the proposed residential units.

Once noise emissions from operational plant are designed to not exceeded the noise criteria at the new residential units within the proposed development, the related noise impact to existing NSLs offsite will be imperceptible. The overall

outward noise impact of mechanical and electrical services on site to existing surrounding NSLs is determined to be neutral, imperceptible and long-term.

12.9.2.2 Additional Traffic on Public Roads

For the purposes of assessing the potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads and junctions with and without the proposed development, given that traffic from the development will make use of the existing road network.

As stated in the DMRB Noise and Vibration (UKHE 2020), Volume 11, Section 3, Part 7, in order to increase traffic noise levels by + 1 dB traffic volumes would need to increase by the order of 25%. With reference to the traffic impact assessment prepared by MHL as part of the Section 32B submission it states that *“the predicted impacts of the development are below 10% on all links in the study area, with the exception of the section of Mountain Road between the site access junction and the R611 and between Mountain Road and Forest Road”*. The traffic impact assessment highlights a 48% increase in traffic along Mountain Road, based on this assessment the worst-case noise level increase along mountain road will be in the region of +2.9dB. With reference to Table 12-6 the likely associated impact in relation to operational traffic noise is negative, not significant and long term.

12.9.2.3 Outward Noise from Plaza and Creche

The proposed development includes a creche and plaza as part of its design, in relation to potential noise generated by these aspects of the development the following comment is provided.

The noise levels presented within Table 12-7 derive appropriate external levels so as to achieve the required internal noise levels in line with the guidance of BS 8233. The introduction of the plaza within the centre of the site will introduce noise in the way of cafes and retail space. Sources of noise will be in the form of mechanical plant and human interactions that occur in external areas of the plaza. Any introduction of mechanical plant will need to comply with the criteria set within section 12.9.2.1. Due to the distance between the plaza and the nearest NSLs within the development noise relating to humans is negligible. The operational impact of the plaza is deemed to be negative, not significant and long term.

Measurement of noise levels generated by children playing outdoors at several crèches and kindergartens indicate typical noise levels in the order of 56 dB L_{Aeq,1hr} at distance of 5 metres. The nearest noise sensitive areas are located within the development at ground floor level, approximately 35m from the creche. Considering the usage of the creche area (e.g. external areas are only expected to be in use for a portion of the 16 hour daytime period) and the expected standard noise insulation of the façade, it is predicted that the internal criteria within Table 12-7 will be met in all residential units and the resultant noise impact due to the creche is negative, not significant and long term.

12.9.3 Cumulative Effects

12.9.3.1 Construction Phase

In the event that construction activities at nearby sites are taking place concurrently with the construction of the proposed development, there is potential for cumulative noise impacts to occur. Due to the nature of construction works associated with the proposed development, noise levels from this site will dominate the noise environment when occurring in proximity to the noise sensitive locations along its immediate boundary. The noise contribution from other construction sites would need be equal to those associated with the proposed development in order to result in any cumulative effect.

In the event of the two construction phases of the proposed development overlapping predicted construction noise levels within Section 12.9.1 may rise by the order of +3 dB.

12.9.3.2 Operational Phase

The noise limits set for on-site buildings are designed to avoid any significant increase in the prevailing background noise environment external to the site. Operational noise limits included in this report refer to cumulative noise from all fixed installations on site. The design of plant and other fixed installations will be progressed during the design stage to ensure the noise limits at off-site noise sensitive locations are not exceeded.

Traffic volumes assessed take account of the additional traffic from other permitted developments and therefore the traffic noise assessment presented is already assessing the cumulative impact. This assessment has concluded there will be no significant noise impact due to operational traffic.

12.9.4 Summary

The following Table summarises the identified likely significant effects during the construction phase of the proposed development before mitigation measures are applied.

Table 12-13 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Site Set Up, Clearance and Demolition Noise	Negative	Not Significant to Very Significant	Significant to Very Significant within 10m of NSLs, Slight to Moderate at NSLs beyond 90m. Not Significant if durations within Section 12.4.3.3 are not exceeded.	Likely	Temporary	Direct
Provision of Site Services Noise	Negative	Slight to Moderate to Very Significant	Significant to Very Significant within 10m of NSLs, Moderate to Significant between 30 and 50m and Slight to Moderate beyond 50m.	Likely	Short- Term	Direct
General Construction Noise	Negative	Slight to Moderate to Very Significant	Significant to Very Significant within 10m of NSLs, Moderate to Slight to Moderate beyond 20m.	Likely	Short- Term	Direct
Construction Phase Vibration	Negative	Moderate to Not Significant	Moderate at NSLs within 20m of breaking, Not Significant beyond this distance	Unlikely dependent on distance	Brief	Direct
Construction Phase Traffic	Negative	Not Significant	Not significant at all NSLs.	Likely	Short- Term	Direct

The following Table summarises the identified likely significant effects during the operational phase of the proposed development before mitigation measures are applied.

Table 12-14 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Mechanical Plant and Services	Negative	Imperceptible	Imperceptible as long as operational plant are designed to not exceeded the noise criteria	Likely	Long Term	Direct
Additional Traffic on Public Roads	Negative	Not Significant	Not Significant on all Road Links	Likely	Long Term	Direct
Outward Noise from Plaza and Creche	Negative	Not Significant	Not Significant at NSLs within and outside of development	Likely	Long Term	Direct

12.10 Mitigation Measures

12.10.1 Construction Phase Mitigation

The assessment detailed in Section 12.9.1 has determined that construction activities can operate within the adopted construction noise threshold levels at NSLs 30m and beyond for the site set up phase, 50m for the site services phase and 20m and beyond for the general construction phase of the proposed development. At NSLs situated close to the site there is a high potential for the CNT to be exceeded during the three phases of works.

Vibration levels at the neighbouring buildings beyond 20m are expected to be orders of magnitude below the limits set out in Table 12-3 to avoid any cosmetic damage to buildings.

A suite of noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid exceedance of the adopted construction noise threshold values at the nearest NSLs. The best practice measures set out in BS 5228 (2009 +A1 2014) Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to:

- Selection of quiet plant;
- Noise control at source;
- Screening, and;
- Liaison with the Public

Further comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, hours of work and noise monitoring, where required.

12.10.1.1 Selection of Quiet Plant

The potential for any item of plant to result in exceedance of construction noise thresholds will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever practicable (e.g., plant items with sound attenuation incorporated). Should a particular item of plant already on the site be found to exceed the construction noise thresholds, the first action will be to identify whether the item can be replaced with a quieter alternative.

The appointed contractor will evaluate the choice of excavation, breaking, piling or other working methods taking into account various ground conditions and site constraints. Where alternative lower noise generating equipment are available that will provide equivalent structural / excavation results, these will be selected to control noise within the relevant thresholds, where it is practicable to do so.

12.10.1.2 Noise Control at Source

The following measures will be implemented, by the appointed contractor to control noise at source. These measures relate to specific site considerations:

- For mobile plant items such as dump trucks, cranes, excavators and loaders, the installation of an acoustic exhaust, utilising an acoustic canopy to replace the normal engine cover and / or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant will be switched off when not in use and not left idling.
- For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting a muffler or sound reducing equipment to the breaker 'tool' and ensuring any leaks in the air lines are sealed;
- Where compressors, generators and pumps are located in proximity to NSLs and have the potential to exceed the construction noise thresholds, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation; and
- Resonance effects in panel work or cover plates can be reduced through stiffening or the application of damping compounds, while other noise nuisance can be controlled by fixing resilient materials in between the surfaces in contact.

For all materials handling, ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.

12.10.1.3 Screening

Screening is an effective method of reducing CNLs at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver. Standard construction site hoarding (2.4 m in height) with a mass per unit of surface area greater than 7 kg/m² can provide adequate sound insulation. This is recommended, as a minimum around all site boundaries of the proposed development site.

Erection of localised demountable enclosures or screens will be used around particularly noisy equipment as required, when in operation in proximity to NSLs with the potential to exceed the construction noise thresholds. Annex B of BS 5228-1 (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on-site from standard materials. A well placed and designed mobile temporary screen around a pile, breaker or excavation can effectively reduce noise emissions by 10 dB(A).

In addition, careful planning of the construction site layout will also be considered. The placement of site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening.

12.10.1.4 Hours of Work

Working hours will be restricted to 07:00 to 18:00 Monday to Friday & 08:00 to 16:00 on Saturdays. Sunday or Bank Holiday work will only take place periodically at the agreement with Cork County Council. Similarly, any other out of hours working will be only permitted by arrangement with site management and Cork County Council.

12.10.1.5 Liaison with the public

A designated Community Liaison Officer (CLO) will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the CLO. In addition, prior to particularly noisy construction activity, the CLO will inform the nearest noise sensitive locations of the time and expected duration of the noisy works.

12.10.1.6 Monitoring

During the construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996-1 (ISO 2016) and ISO 1996-2 (ISO 2017).

12.10.1.7 Vibration Control

Vibration from construction activities will be limited to the values set out in Table 12-3 to avoid any form of potential cosmetic damage to buildings and structures. Monitoring will be undertaken at sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values in Table 12-3. This will be at NSLs within 20m of the proposed rock breaking.

12.10.2 Operational Phase Mitigation

12.10.2.1 Traffic Along Surrounding Road Network

Changes to traffic flows will result in a not significant increase in noise level in the surrounding environment. Therefore, no mitigation measures are necessary in this case.

12.10.2.2 Building Services Noise

With consideration at the detailed design stage, the selection and location of plant items within the proposed development and associated buildings will ensure that noise emissions from any mechanical and electrical building services plant do not exceed the relevant noise criteria within Section 12.4.4, therefore no further mitigation is required. In addition, noise emissions should be broadband in nature and should not contain any tonal or impulsive elements.

Once operational noise emissions are controlled within the development site, there will be no perceptible noise impact at sensitive receivers off-site.

12.10.2.3 Plaza and Creche Noise

As outlined within section 12.9.2.3 noise related to the proposed plaza and creche will result in a not significant effect. Notwithstanding this the operation of both the creche and plaza will be limited to within the daytime hours and not cause noise nuisance that exceeds the internal noise criteria presented within Section 12.4.4.

12.11 Residual Impact Assessment

12.11.1 Construction Phase

The use of best practice noise control measures, hours of operation, scheduling of works within appropriate time periods, and noise monitoring during this phase will be implemented. With the inclusion of the various noise and vibration control measures on site discussed in Section 12.10, it is expected that calculated noise levels in Table 12-12 can be reduced by 5 to 10 dB.

After the implementation of mitigation measures, residual construction noise levels at the closest NSLs within 10m are still expected to be up to 15 dB above the CNT of 65 dB $L_{Aeq,T}$ during the site set up, clearance and demolition phase of works. This will affect the nearest identified NSLs within 10m of the construction to the northeast of the site during this phase for intermittent periods. Referring to Table 12-2 there is a potential for a residual temporary, negative, significant to very significant impact at these NSLs during the site set up and clearance and preparation phase. This will reduce to a temporary, negative, moderate to significant effect at distances beyond 30m and temporary, negative and slight to moderate beyond 50m. However, as outlined within section 12.9.1.2.1 should the demolition phase not exceed the durations of significance within 12.4.3.3 then the overall residual effect during this phase of construction may fall to not significant.

During provision of the site services phase of the proposed development, the NSLs closest to the construction boundary are at distances where, after the implementation of mitigation measures, it is expected that construction noise levels will still exceed the adopted CNT at distances of up to 20m. At NSLs within 10 m a short term, negative and significant to very significant residual impact is predicted, falling to moderate to significant within the 10 to 20m distance band and reducing to slight to moderate at all distances beyond 20m.

During general construction phase of the proposed development, it is expected that construction noise levels will fall within the adopted CNT at distances beyond 10m. At NSLs within 10 m a short term, negative and moderate to significant residual impact is predicted, falling to slight to moderate at all NSLs beyond 10m.

It is important to note that construction activities are inherently transient, meaning noise intrusive works will only affect the nearest NSLs for brief periods. The construction noise calculations are highly conservative, representing a worst-case scenario. In practice, it is likely that the actual noise levels and associated residual impacts will be lower than predicted.

The likely residual effect of construction vibration is short term, negative, and not significant.

12.11.2 Operational Phase

Noise levels from any building services plant within the development site will be controlled to not exceed the noise levels outlined within section 12.4.4.

Once operational noise emissions are controlled within the development site, noise emissions outside the site will be imperceptible. The residual noise effect is neutral, Imperceptible and long Term.

Traffic along the surrounding road network will not lead to a change in noise level that would pose any significant effect. The resultant impact is long-term, negative and not significant.

Summary of Post-mitigation Effects

The following Table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 12-15 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Site Set Up, Clearance and Demolition Noise	Negative	Not Significant to Very Significant	Significant to Very Significant within 30m of NSLs, Moderate to Significant at NSLs between 30 to 50m and Slight to Moderate beyond 50m. Not Significant if durations within Section 12.4.3.3 are not exceeded.	Likely	Temporary	Residual
Provision of Site Services Noise	Negative	Slight to Moderate to Very Significant	Significant to Very Significant within 10m of NSLs, Moderate to Significant between 10 and 20m and Slight to Moderate beyond 20m.	Likely	Short- Term	Residual
General Construction Noise	Negative	Slight to Moderate to Significant	Moderate to Significant within 10m of NSLs, Slight to Moderate beyond 10m.	Likely	Short- Term	Residual
Construction Phase Vibration	Negative	Not Significant	Not Significant once mitigation implemented	Unlikely dependent on distance	Brief	Residual
Construction Phase Traffic	Negative	Not Significant	Not significant at all NSLs.	Likely	Short- Term	Residual

The following Table summarises the identified likely residual significant effects during the operational phase of the proposed development post mitigation.

Table 12-16 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Mechanical Plant and Services	Negative	Not Significant	Not Significant as long as operational plant are designed to not exceeded the noise criteria	Likely	Long Term	Residual
Additional Traffic on Public Roads	Negative	Not Significant	Not Significant on all Road Links	Likely	Long Term	Residual
Outward Noise from Plaza and Creche	Negative	Not Significant	Not Significant at NSLs within and outside of development	Likely	Long Term	Residual

12.11.4 Cumulative Residual Effects

There is potential for a temporary increase in cumulative construction noise if multiple phases or other developments occur at the same time. Residual cumulative effects related to the construction phase, post-mitigation, are likely to be not significant. This is also true for the operational phase, provided that the operational noise levels outlined in 12.9.2.1. are adhered to during the detailed design, and the mitigation measures specified in section 12.10 are followed.

12.12 Risk of Major Accidents or Disasters

The assessment of noise and vibration during both the construction and operational phases of the project has been conducted in accordance with relevant regulations and guidelines.

During the construction phase, the primary risks associated with noise and vibration include equipment failure, which can lead to unexpected high noise levels and potential disturbances or harm to nearby residents and workers, and accidental spills or explosions, which can result in sudden, high-intensity noise and vibration, posing risks to human health and structural integrity. Mitigation measures outlined within section 12.10 decrease the chances of these events taking place.

In the operational phase, the risks are generally lower but still present, such as operational malfunctions, where failures in noise control systems or unexpected operational changes can lead to increased noise levels. Mitigation strategies involve monitoring, adherence to operational noise limits as specified in section , and implementation of the mitigation measures outlined in section 12.10.

Overall, with the application of these mitigation measures, the risk of major accidents or disasters resulting in significant noise and vibration impacts is considered to be low.

12.13 Interactions

The potential interaction between noise and vibration and other specialist chapters in the EIAR is primarily limited to Population & Human Health, Traffic & Transport and Biodiversity. This chapter has been prepared in consideration of

and in conjunction with the relevant elements of these chapters. For example, noise and vibration impacts associated with the Proposed Development have been fully considered within this Chapter of the EIA Report. The traffic flow projections associated with the development provided by the traffic consultants has been utilised in the operational section in this Chapter of the EIAR report.

12.14 Monitoring

12.14.1 Construction Phase

During the demolition/construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996-1 (ISO 2016) and ISO 1996-2 (ISO 2017).

12.14.2 Operational Phase

There are no proposed monitoring requirements associated with the operational phase of the proposed Development.

12.15 Conclusion

In conclusion an assessment of noise and vibration impacts associated with the proposed Carrigaline residential development has been conducted for both the construction and operational phases. Reference has been made to the most up to date and relevant standards and guidance and all findings of the report have been compiled within this EIAR chapter.

A baseline noise survey has been carried out to determine the prevailing noise environment and to inform the impact assessment.

During the construction phase, noise and vibration levels are expected to be higher due to activities such as excavation, and the use of heavy machinery. Mitigation measures outlined within Section 12.10 will be implemented across the site and at distances where significant effects have been identified. Despite these mitigation measures, some short-term, moderate to very significant impacts will occur at NSLs closest to the construction of the proposed development.

In the operational phase, the primary sources of noise will be from traffic associated with the proposed development and the introduction of any mechanical plant associated with the proposed development. The predicted noise levels are expected to be within acceptable limits as defined by relevant standards and guidelines.

Both construction and operational vibration associated with the proposed development is anticipated to be not significant.

12.16 References and Sources

- 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
- BS 5228-2:2009+A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (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 (BSI 2008);
- BS 8233:2014 Guidance on sound insulation and noise reduction for buildings
- BS 4142: 2014 +A1 2019 Methods for Rating and Assessing Industrial and Commercial Sound (BSI 2019);
- UK Highways England (UKHE) Design Manual for Roads and Bridges (DMRB) LA 111 Sustainability and Environmental Appraisal LA 111 Noise and Vibration Revision 2 (UKHE 2020);
- S.I. No. 549/2018 – European Communities (Environmental Noise) Regulations 2018
- S.I. No. 241/2006 - European Communities Noise Emission by Equipment for Use Outdoors (Amendment) Regulations 2006;
- International Organization for Standardization (ISO) 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors - Part 2: General method of calculation (ISO 1996);
- ISO 1996-1: 2016 Acoustics - Description, measurement and assessment of environmental noise. Part 1: Basic quantities and assessment procedures (ISO 2016);
- ISO 1996-2:2017 - Description, measurement and assessment of environmental noise - Part 2: Determination of sound pressure levels (ISO 2017), and;
- The UK Department of Transport Calculation of Road Traffic Noise (UK Department of Transport 1998).

CHAPTER THIRTEEN

AIR QUALITY & CLIMATE



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER THIRTEEN

Table of Contents

Air Quality & Climate

13.1 Introduction..... 13-1

13.2 Expertise & Qualifications 13-5

13.3 Guidance..... 13-5

13.4 Proposed Development 13-5

13.5 Methodology 13-6

13.6 Difficulties Encountered 13-16

13.7 Baseline 13-16

13.8 The ‘Do Nothing’ Scenario 13-18

13.9 Potential Significant Effects 13-18

13.10 Mitigation Measures 13-22

13.11 Residual Impact Assessment 13-23

13.12 Risk of Major Accidents or Disasters 13-23

13.13 Worst Case Scenario..... 13-24

13.14 Interactions 13-24

13.15 Monitoring 13-24

13.16 Conclusion 13-25

13.17 References and Sources 13-25

Table of Tables

Table 13-1 Limit Values of Cleaner Air for Europe (CAFE) Directive 2008/50/EC (Source: EPA 2020)	13-1
Table 13-2 Dust Emission Magnitude for the site	13-9
Table 13-3 Sensitivity of People to Dust Soiling Effects (Source: IAQM, 2024)	13-10
Table 13-4 Sensitivities of People to the Health Effects of PM ₁₀ (Source: IAQM, 2024)	13-10
Table 13-5 Sensitivity to Dust Soiling Effects on People and Property...	13-10
Table 13-6 Sensitivity of the Area to Human Health Impacts	13-11
Table 13-7 Risk of Dust – Earthworks	13-11
Table 13-8 Risk of Dust – Construction	13-11
Table 13-9 Risk of Dust – Trackout	13-11
Table 13-10 Indicative Criteria for Requiring an Air Quality Assessment (Source: IAQM, 2017)	13-12
Table 13-11 Receiving Environment Sensitivity (Source: DMRA LA 105)	13-12
Table 13-12 Traffic Data Applied to the DMRB Model	13-13
Table 13-13 Sensitive Receptors	13-13
Table 13-14 Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations (Source: Adapted from TII, 2011)	13-14
Table 13-15 Air Quality Impact Descriptors for Changes to Annual Mean NO ₂ and PM ₁₀ Concentrations at Receptors (Source: Adapted from TII, 2011)	13-14
Table 13-16 Air Quality Impact Descriptors for Changes to Annual Mean NO ₂ and PM ₁₀ Concentrations at Receptors (Source: Adapted from TII, 2011)	13-15

Table 13-17 Factors to Consider when Determining Air Quality Significance (Source: Adapted from TII, 2011)	13-15
Table 13-18 Concentrations of NO ₂ at Zone B Monitoring Stations	13-16
Table 13-19 Concentrations of PM ₁₀ at Zone B Monitoring Stations	13-16
Table 13-20 Monthly Rainfall Values (mm) for Cork Airport Weather Station from January 2021 to December 2024 (Source: Met Eireann) ..	13-17
Table 13-21 Dust Emission Magnitude for the Site	13-18
Table 13-22 Sensitivity of the Area	13-19
Table 13-23 Summary of Unmitigated Risks	13-19
Table 13-24 Table for Determination of Simple or Detailed Assessment (Source: DMRB LA 105 Guidance)	13-19
Table 13-25 Modelled Baseline NO ₂ and PM ₁₀ Concentrations (2024) ..	13-19
Table 13-26 Predicted Annual Mean Concentrations of NO ₂ (Opening Year 2026)	13-20
Table 13-27 Predicted Annual Mean Concentrations of NO ₂ (Design Year 2041)	13-20
Table 13-28 Summary of Construction Phase Likely Significant Effects in the Absence of Mitigation	13-21
Table 13-29 Summary of Operational Phase Likely Significant Effects in the Absence of Mitigation	13-21
Table 13-30 Summary of Construction Phase Effects Post Mitigation ...	13-23
Table 13-31 Summary of Operational Phase Effects Post Mitigation	13-23

Table of Figures

Figure 13-1 Ireland’s Greenhouse Gas Emissions Share by Sector
for 2023 (EPA, 2024) 13-4

Figure 13-2 Steps to Perform a Dust Assessment (IAQM, 2024)..... 13-6

Figure 13-3 Map Showing 20m Buffer from the Site Boundary 13-7

Figure 13-4 Map Showing 50m Buffer from the Site Boundary 13-7

Figure 13-5 Map Showing 100m Buffer from the Site Boundary 13-8

Figure 13-6 Map Showing 250m Buffer from the Site Boundary 13-8

Figure 13-7 Sensitive Receptor Map 13-13

Figure 13-8 Wind Speed Frequency Distribution at Cork Airport
Synoptic Weather Station over 30 years (1992-2021) 13-17

Figure 13-9 30-year Windrose at Cork Airport Synoptic Weather
Station 1992-2021 (Developed using Met Eireann Hourly Data) 13-18

CHAPTER THIRTEEN | Air Quality & Climate

13.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on air quality and climate.

Taking into account Ambient Air Quality Standards¹, the baseline air quality was examined along with the potential for release of emissions to the atmosphere and associated effects prior to and following mitigation measures. This chapter also describes and assesses the potential impacts on micro and macro-climate as a result of the proposed development. Attention will be 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.

It should be read in conjunction with the Population and Human Health, Land and Soils, Biodiversity and Traffic Chapters of this EIAR, as well as the Site-Specific Flood Risk Assessment and Climate Action and Energy Statement.

Ambient Air Quality Standards

For the protection of health and ecosystems, EU directives apply air quality standards in Ireland and other EU member states for a range of pollutants. These rules include requirements for monitoring, assessment and management of ambient air quality. The first major instrument in tackling air pollution was the Air Quality Framework Directive 96/62/EC and its four daughter Directives. Each of these instruments was repealed with the introduction of Directive 2008/50/EC on ambient air quality and cleaner air for Europe in 2008 (as amended by Decision 2011/850/EU and Directive 2015/1480/EC) (the “CAFE Directive”), save for the “Fourth Daughter Directive” (Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air).

The CAFE Directive lays down measures aimed at:

- 1) Defining and establishing objectives for ambient air quality designed to avoid, prevent or reduce harmful effects on human health and the environment as a whole;
- 2) Assessing the ambient air quality in Member States on the basis of common methods and criteria and, in particular, assessing concentrations in ambient air of certain pollutants;
- 3) Providing information on ambient air quality in order to help combat pollution and nuisance and to monitor long-term trends and improvements resulting from national and Community measures;
- 4) Ensuring that such information on ambient air quality is made available to the public;
- 5) Promoting increased cooperation between Member States in reducing air pollution.

Ambient air quality monitoring and assessment in Ireland is carried out in accordance with the requirements of the CAFE Directive. The CAFE Directive has been transposed into Irish legislation by the Air Quality Standards Regulations (S.I. No. 180 of 2011). The CAFE Directive requires EU member states to designate ‘Zones’ reflective of population density for the purpose of managing air quality. Four zones were defined in the Air Quality Standards Regulations (2011) and subsequently amended in 2013 to account for 2011 census population counts and to align with coal restricted areas in the Air Pollution Act (Marketing, Sale, Distribution and Burning of Specified Fuels) Regulations 2012. (S.I. No. 326 of 2012) (the 2012 Regulations).

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 site is located in Carrigaline, Co. Cork and falls under the ‘Zone B’ category based on the Air Quality Standards Regulations.

The CAFE Directive outlines certain limit or target values specified by the five published directives that apply limits to specific air pollutants. These limits, outlined in Table 13-1, will be referred to as part of the proposed development assessment with respect to air quality.

Table 13-1 Limit Values of Cleaner Air for Europe (CAFE) Directive 2008/50/EC (Source: EPA 2020)

Pollutant	Limit Value Objective	Averaging Period	Limit Value µg/m³	Limit Value ppb	Basis of Application of the Limit Value	Limit Value Attainment Date
SO ₂	Protection of Human Health	1 hour	350	132	Not to be exceeded more than 3 times in a calendar year	1 Jan 2005
SO ₂		24 hours	125	47	Not to be exceeded more than 3 times in a calendar year	1 Jan 2005
SO ₂	Protection of vegetation	Calendar year	20	7.5	Annual mean	19 July 2001
SO ₂		1 Oct to 31 Mar	20	7.5	Winter mean	19 July 2001
NO ₂	Protection of human health	1 hour	200	105	Not to be exceeded more than 18 times in a calendar year	1 Jan 2010
NO ₂		Calendar year	40	21	Annual mean	1 Jan 2010
NO ₂ + NO ₂	Protection of ecosystems	Calendar year	30	16	Annual mean	19 July 2001

1 Air Quality Standards Regulations 2011 (S.I No. 180 of 2011) Irish Statute Book.

Pollutant	Limit Value Objective	Averaging Period	Limit Value $\mu\text{g}/\text{m}^3$	Limit Value ppb	Basis of Application of the Limit Value	Limit Value Attainment Date
PM ₁₀	Protection of human health	24 hours	50	-	Not to be exceeded more than 35 times in a calendar year	1 Jan 2005
PM ₁₀		Calendar year	40	-	Annual mean	1 Jan 2005
PM _{2.5} – Stage 1		Calendar year	25	-	Annual mean	1 Jan 2015
PM _{2.5} – Stage 2		Calendar year	20	-	Annual mean	1 Jan 2020
Lead		Calendar year	0.5	-	Annual mean	1 Jan 2005
Carbon Monoxide		8 hours	10,000	8,620	Not to be exceeded	1 Jan 2005
Benzene		Calendar year	5	1.5	Annual mean	1 Jan 2010

The EPA is the competent authority for the purpose of the CAFE Directive and is required to send an annual report to the Minister for Environment and the European Commission. The regulations further provide for the distribution of public information. This includes information on any exceedances of target values, the reasons for exceedances, the area(s) in which they occurred, and the relevant information regarding effects on human health and environmental impacts.

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 boarder European Green Deal, 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.

The text will be published in the EU’s Official Journal and enter into force on the twentieth day following publication. Member states will have two years after the entry into force to transpose the directive into national law.

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 13-1.

13.1.2 Climate Agreements

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, and extreme weather events.

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. To ensure compliance with the protocol, the Intergovernmental Panel on Climate Change (IPCC) has outlined detailed guidelines on compiling National Greenhouse Gas 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.

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. The Doha Amendment came into force on ratification on 31 December 2020. However, this has now been superseded by the Paris Agreement.

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. 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 the 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:

- 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 greenhouse gas 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 greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels.

13.1.2.1 National Policy in Ireland

National climate policy in Ireland recognises the threat of climate change to humanity and supports mobilisation of a comprehensive international response to climate change, and global transition to a low-carbon future.

The Climate Action and Low Carbon Development (Amendment) Act 2021 was enacted in 2021 and 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. The Act provides the framework for Ireland to meet its international and EU climate commitments and to become a leader in addressing climate change.

The Climate Action Plan 2024 (CAP24) is the third 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). A draft plan was agreed by the Irish Government in December 2023 and, following the completion of Strategic Environmental Assessment and Appropriate Assessment (in accordance with the European Union Directives), the finalised version of the CAP24 was approved by the Irish Government on 21st May 2024.

CAP24 builds on the previous plans by refining and updating the measures and actions required to deliver the carbon budgets and sectoral emissions ceilings and is focused on:

- Underpinning delivery of the established pathways by conducting a stock-take of progress to date, in order to identify gaps and potential corrective actions;
- Identifying measures to address unallocated emission savings; and
- Identifying an approach to achieving emissions reduction and to reporting in the Land Use, Land Use Change and Forestry (LULUCF) sector.

The supplementary Annex of Actions which accompanies the Climate Action Plan has also been approved by the Irish Government. For 2024, a new approach to the 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.

The Environmental Protection Agency (EPA) Ireland published Ireland’s first Climate Change Impact Assessment Report (ICCA) in January 2024. This major scientific assessment serves to complement and localise the global assessments undertaken by the Intergovernmental Panel on Climate Change (IPCC). Its findings build upon these assessments and add important local and national context. The ICCA is the first comprehensive and authoritative assessment of knowledge of climate change in Ireland.

More action is needed to meet Ireland’s legally binding emissions targets including large-scale and immediate emissions reductions across the energy system, which is currently heavily dependent (86%) on fossil fuels. Ireland needs to be resilient to ongoing and future climate change impacts. Implementation of climate adaptation measures is currently too slow and fragmented.

Immediate and sustained transformative mitigation and adaptation actions are likely to yield substantial benefits for health, wellbeing and biodiversity in Ireland while reducing vulnerability to the adverse impacts of climate change.

In February 2024, Cork County Council adopted the Cork County Council Climate Change Action Plan (CAP) 2024-2029. The Cork CAP is aligned with the Irish Government’s national climate objectives and targets, which seek to transition to a climate resilient, biodiversity rich, environmentally sustainable climate neutral economy by 2050.

The CAP sets a pathway for Cork County Council to actively translate national climate policy to local circumstances with prioritisation and acceleration of evidence-based measures including to:

- Reduce its direct carbon emissions by 51% by 2030;
- Assist in the delivery of the climate neutrality objective at local and community levels; and
- Identify and support the development of a Decarbonising Zone (DZ) within the local authority area.

The implementation of the measures promoted in the Cork County Council CAP will enable Cork County Council to adapt to climate change and will assist in bringing Ireland closer to achieving its climate related targets in future years. New developments need to be cognisant of the Cork County Council CAP and incorporate climate friendly designs and measures where possible.

Ireland’s latest greenhouse gas (GHG) emissions 1990-2023 are provisional figures based on the Sustainable Energy Authority Ireland’s (SEAI’s) final energy balance released in June 2024 (EPA, 2024). In 2023, Ireland’s GHG emissions are estimated to be 55.01 million tonnes carbon dioxide equivalent (Mt CO₂eq), which is 6.8% lower (or 400 Mt CO₂eq) than emissions in 2022 (59.00 Mt CO₂eq) and follows a 2.0% decrease in emissions reported in 2022. Emissions are 1.2% below the historical 1990 baseline for the first time in 33 years.

In 2023, emissions in the stationary Emissions Trading Scheme (ETS) sector decreased (17%) and emissions under the ESR (Effort Sharing Regulation) decreased by (3.4%). When Land Use, Land Use Change and Forestry (LULUCF) is included, total national emissions decreased by 3.8%.

Decreased emissions in 2023 compared to 2022 were observed in the largest sectors except for transport which showed an increase of 0.3%.

Emissions per capita decreased from 11.4 tonnes CO₂eq per person in 2022 to 10.4 tonnes CO₂eq per person in 2023. Ireland’s average tonnes of GHG per capita over the last ten years were 12.1 tonnes. With recent Central Statistics Office (CSO) preliminary 2023 census data showing a population of 5.28 million people and with population projected to increase to 5.5 million in 2030, 5.9 million in 2040 and 6.2 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.

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 provisional greenhouse gas emission inventory for 2023 is the third 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 emissions 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 its greenhouse gas emissions by at least 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 2023 is 40.52 Mt CO₂eq. Ireland's provisional 2023 greenhouse gas ESR emissions are 42.79 Mt CO₂eq, this is 2.27 Mt CO₂eq more than the annual limit for 2023. This value is the national total emissions less emissions generated by stationary combustion i.e. power plants, cement plants, and domestic aviation operations that are within the EU's emissions trading scheme. Cumulatively, from 2021-2023 and after using the ETS flexibility, Ireland is in compliance with the ESR by a net distance to target of 0.15 Mt CO₂eq, although in 2023 there is an exceedance of 0.36 Mt CO₂eq above its Annual Emissions Allocation with the ETS flexibility. Agriculture and Transport accounted for 76.0% of total ESR emissions in 2023. The revised LULUCF Regulation (2023) incorporates new rules around the 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 quality of flexibility in each budgetary period.

The latest projections (May 2024) indicate that currently implemented measures (With Existing Measures) will achieve a reduction of 9% 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 25% 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 budget 2021-2025 to 2026-2030. 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 greenhouse gas (GHG) emissions increased in the period from 1990 to 2001 where it peaked at 70.82 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 2.0% 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 following by a 6.8% reduction in emissions in 2023.

Ireland's GHG emissions have decreased by 1.2% from 1990-2023.

In relation to the greenhouse gases, carbon dioxide (CO₂) accounted for 61.0% of the total, with methane (CH₄) and nitrous oxide (N₂O) contributing 28.9% and 8.8% as CO₂ equivalent, respectively and F-gases contributing 1.3% of the total as CO₂ equivalent.

In 2023, the energy industries, transport and agriculture sectors accounted for 73.5% of total GHG emissions. Agriculture is the single largest contributor to the overall emissions, at 37.8%. Transport, energy industries and the residential sector are the next largest contributors, at 21.4%, 14.3% and 9.7%, respectively (EPA, 2024).

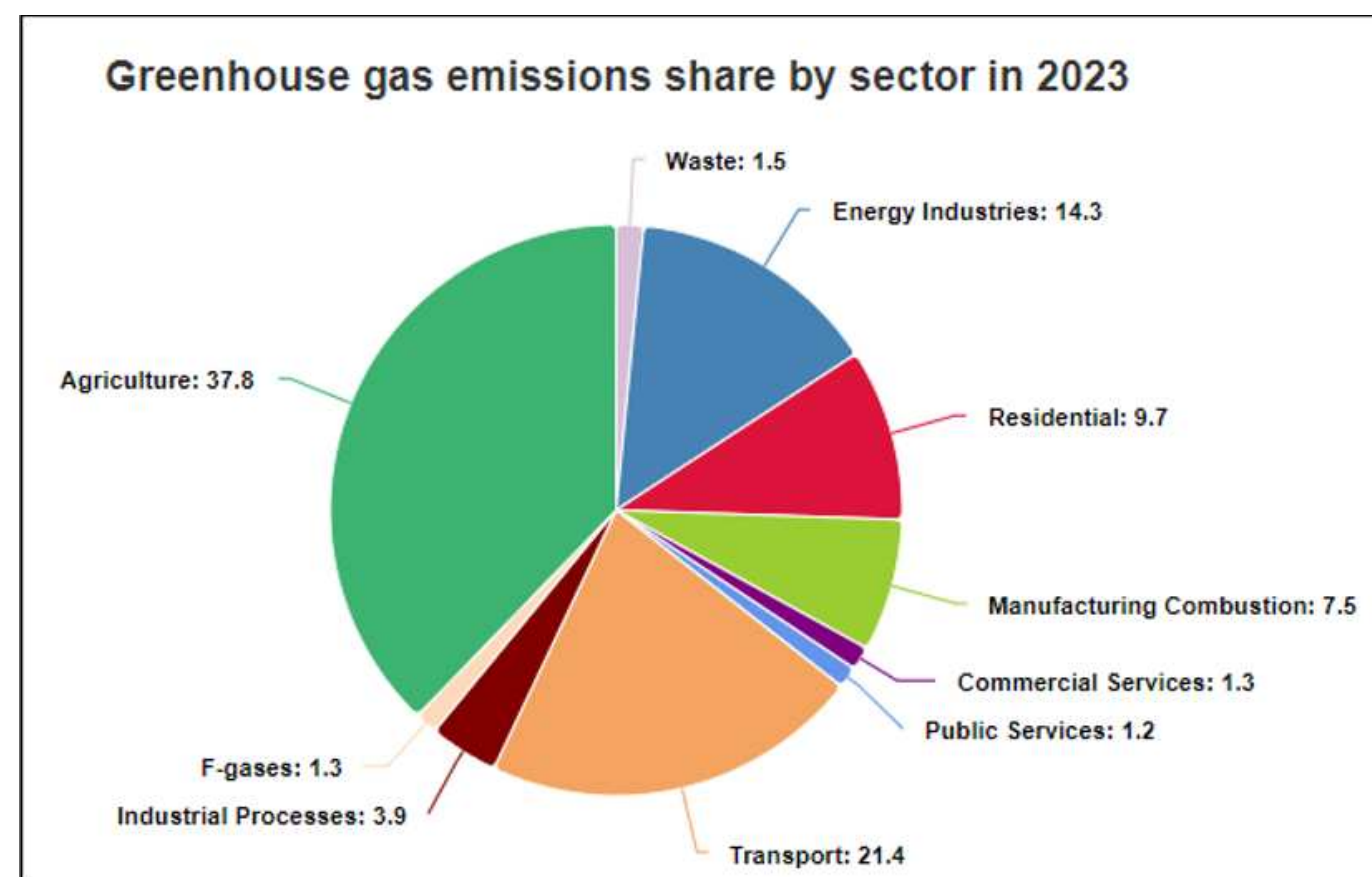


Figure 13-1 Ireland's Greenhouse Gas Emissions Share by Sector for 2023 (EPA, 2024)

The Climate Change Advisory Council submitted their Annual Review 2023 to the Minister of the Environment, Climate and Communications on 21st of July 2023. 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. The overall recommendations are as follows:

- Government needs to identify and remove barriers to policy implementation by ensuring adequate funding and planning reform at scale and speed;
- Key actions need to be implemented now to prevent longer term drainage and increased costs to society and the economy;
- Government must adopt new approaches to address emission reductions, creating investment and enhancing skills

across the economy, particularly in areas such as retrofitting and renewable energy;

- The establishment of a Just Transition Commission is recommended to ensure that Ireland achieves its climate objectives in a way that is fair and equitable and protects vulnerable people and communities; and
- The Government should support opportunities to reduce emissions and make Ireland better prepared for the impacts of climate change.

13.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Laura Griffin of Enviroguide Consulting.

Laura holds 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 been working as an Environmental Consultant with Enviroguide since 2021 and has 5 years of professional experience. Laura has built up experience in EIAs for a range of residential and commercial developments, particularly for LRD (previously SHD) projects in Dublin and across Ireland. Laura's experience includes EIA Screening, EIAR report writing and coordination, Air Quality Assessment Reports, Resource Waste Management Plans and Construction Environmental Management Plans. Laura has been involved in the preparation of EIARs for the following projects:

- Donore Project (St. Teresa's Gardens):
 - Project Description: Residential scheme on a 3.26-hectare site with a net developable area of 2.05 hectares on the former St. Teresa's Gardens, Donore Avenue, Dublin 8.
 - Scale: Residential scheme of 543 no. apartments and crèche.
- Blessington Phase 2 and 3:
 - Project Description: Large Scale-Residential Development and residential led master plan at a c. 25.14-hectare site within the townlands of Blessington Demesne, Newpaddocks and Santryhill, Blessington, Co. Wicklow.
 - Scale: 329 no. residential units and the extension of the Blessington Inner Relief Road (approx. 700m long) from the existing 4-arm roundabout at Blessington Demesne Lands, running northwest of Blessington Business Park, and north of the Woodleigh residential area to a new four-arm roundabout junction on the N81 Dublin Road.
- Athlone LRD:
 - Project Description: 10-year permission for the provision of residential development on lands located within the townlands of Ballkeeran and Cornamaddy, Athlone, Co. Westmeath.
 - Scale: 332 no. residential unit masterplan with a 2-storey crèche.

This chapter has been reviewed and approved by Catherine Keogan, Technical Director and EIA Lead at Enviroguide. 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.

13.3 Guidance

This chapter has been prepared having regard to the following guidelines:

- 2030 Climate and Energy Policy Framework (European Commission, 2014) ;
- 2030 EU Climate Target Plan (European Commission, 2021b);
- Assessing GHG Emissions and Evaluating their Significance (Institute of Environmental Management & Assessment (IEMA), 2022);
- Chartered Institute of Ecology and Environmental Management (CIEEM) (2021) Advice on Ecological Assessment of Air Quality Impacts. Chartered Institute of Ecology and Environmental Management. Winchester, UK;
- Climate Action and Low Carbon Development (Amendment) Act 2021 (No. 32 of 2021) (Government of Ireland, 2021);
- Climate Action Plan 2024 (Government of Ireland, 2023);
- 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 for Environment, Food and Rural Affairs (DEFRA) (2022) Air Quality Management Technical Guidance LAQM. TG (22);
- EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports 2022;
- European Commission Guidance on the preparation of the Environmental Impact Assessment Report;
- IAQM Guidance on the Assessment of Dust from Demolition and Construction (2024);
- IAQM Guidance on the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (2022);
- Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes;
- TII Guidance Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106 (2022); and
- Transport Infrastructure Ireland (2023) GE-GEN-01101: Guide to the Implementation of Sustainability for TII Projects.

13.4 Proposed Development

The proposed development consists of permission for a Large-Scale Residential Development consisting of 362 no. residential units, a creche and all ancillary site development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

A comprehensive description of the proposed development is presented in Chapter 2 of this EIAR.

13.4.1 Aspects Relevant to this Assessment

13.4.1.1 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 PM_{10} , $PM_{2.5}$ concentrations from demolition and construction activities (including earthworks and trackout); and
- An increase in concentrations of PM_{10} , $PM_{2.5}$ and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

13.4.1.2 Operational Phase

The aspects of the Operational Phase relevant to this chapter are as follows:

- Energy plant emissions; and
- An increase in concentrations of PM_{10} , $PM_{2.5}$ and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

13.5 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 impacts 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).

A desktop study involving various national and international documents on climate change and analysis of synoptic meteorological data from the nearest Met Éireann station (Cork Airport) was also carried out 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.

13.5.1 Construction Phase

13.5.1.1 Construction Phase 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 PM_{10} , $PM_{2.5}$ concentrations from demolition and construction activities (including earthworks and trackout); and
- An increase in concentrations of PM_{10} , $PM_{2.5}$ and nitrogen dioxide due to exhaust emissions from vehicles and equipment used on site (non-road mobile machinery) and vehicles accessing the site.

As with any impact, the risk will be determined by the magnitude of the source, the effectiveness of the pathway and the sensitivity of the receptor.

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 PM_{10} ; 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 impact.

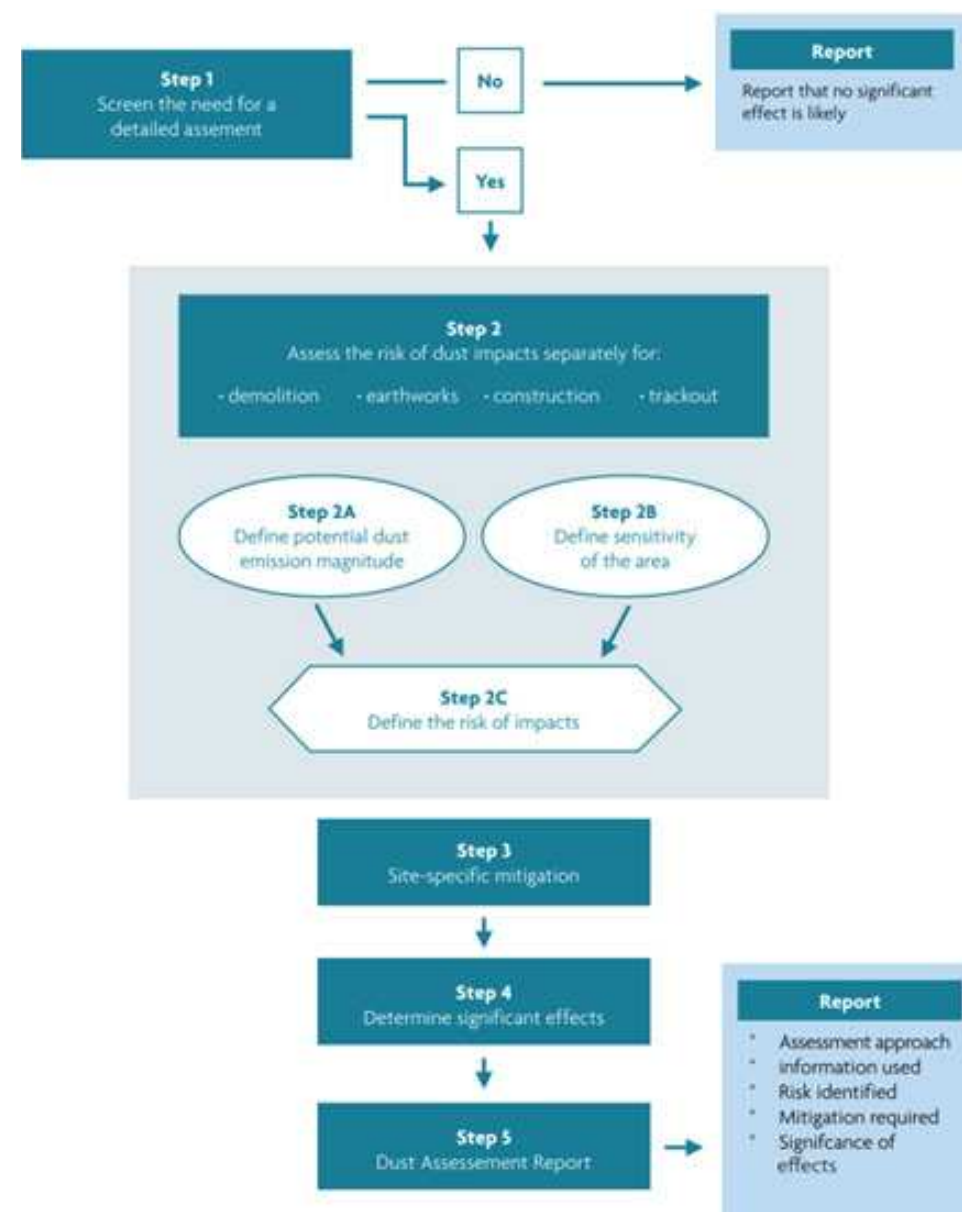


Figure 13-2 Steps to Perform a Dust Assessment (IAQM, 2024)

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).

A review of publicly available information indicates that there are no statutory (international or national) ecological receptors within 50m of the site or applicable construction routes. It can therefore be concluded, as there are no statutory receptors within the distance defined by the criteria, that the level of risk to ecological sites is negligible, and impacts will not be significant.

Therefore, assessment of potential impacts to ecological receptors has been scoped out and is not considered further in this assessment. As such, a detailed assessment of the potential impacts on ecological receptors is not required.



Figure 13-3 Map Showing 20m Buffer from the Site Boundary



Figure 13-4 Map Showing 50m Buffer from the Site Boundary



Figure 13-5 Map Showing 100m Buffer from the Site Boundary

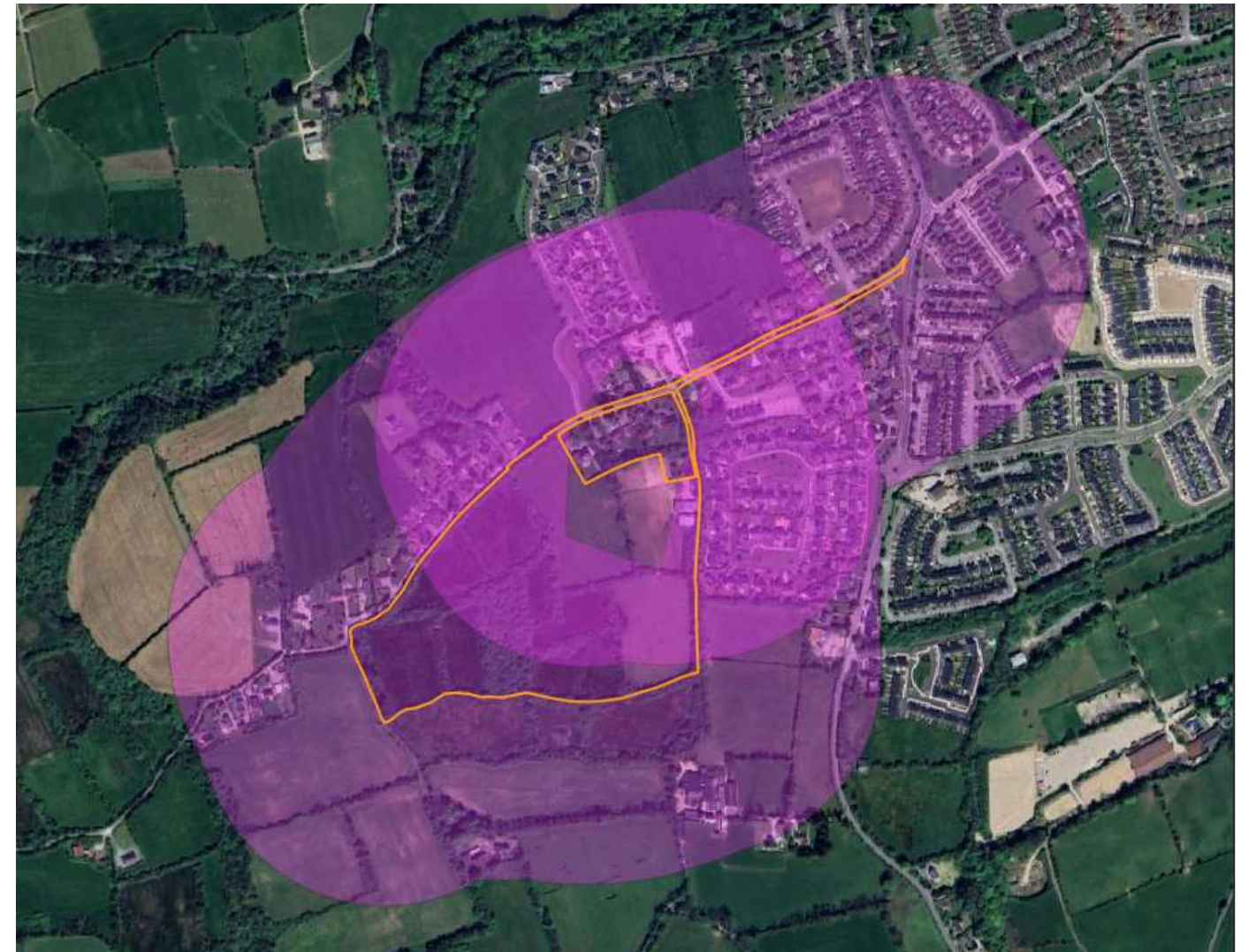


Figure 13-6 Map Showing 250m Buffer from the Site Boundary

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.

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 >75,000m³, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12m above ground level;
- Medium: Total building volume 12,000m³ – 75,000m³, potentially dusty construction material, demolition activities 6-12m above ground level; and
- Small: Total building volume <12,000m³, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6m above ground, demolition during wetter months.

The proposed buildings to be demolished are as follows:

- Building 1: 412.2m³;
- Building 1: 1,675.04 m³; and
- Building 3: 1,644.9 m³.

The total volume of building to be demolished is 3,732.14m³ and therefore, the dust emission magnitude for demolition is defined as small.

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 >110,000m², 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 >6m in height;

- Medium: Total site area 18,000m² – 110,000m², moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m – 6m in height; and
- Small: Total site area <18,000m², soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds >3m in height.

The dust emission magnitude for the proposed earthwork activities can be classified as large, as the total site area is 129,700 m².

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 >75,000m³, on site concrete batching, sandblasting;
- Medium: Total building volume 12,000m³ – 75,000m³, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- Small: Total building volume <12,000m³, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed earthwork activities can be classified as large, as the total building volume to be constructed is 96,153m³.

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 (>3.5t) outward movements² in any one day³, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- Medium: 20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and
- Small: <20 HDV (3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

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.

The dust emission magnitude for the proposed trackout activities can be classified as large as a worst-case scenario.

Table 13-2 Dust Emission Magnitude for the site

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Large
Construction	Large
Trackout	Large

2 A vehicle movement is a one-way journey, i.e., from A to B, and excludes the return journey.

3 HDV movements during the construction project vary over its lifetime, and the number of movements is the maximum, not the average.

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 13-3.

Table 13-3 Sensitivity 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 carparks and showrooms.
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 • Their 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.	• Parks; and • Places of work.
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 carparks⁴; and • Places of work.

4 Carparks 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.

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 13-4 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)⁵.	• Residential properties; • Hospitals; • Schools; and • Residential care homes.
Medium	• Locations where the people exposed are workers⁶, 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 transient⁷.	• Public footpaths; • Playing fields; and • Shopping streets.

Table 13-5 and 13-6 illustrate how the sensitivity of the area may be determined for dust soiling and human health 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 13-5 and 13-6 were used to determine the sensitivity of the area to dust soiling effects and human health impacts.

Table 13-5 Sensitivity to 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

5 This follows Defra Guidance as set out in LAQM.TG (2022)

6 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.

7 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 13-6 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/m³	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
	28-32 µg/m³	>100	High	High	Low	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m³	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m³	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m³	>100	High	Medium	Low	Low
		10-100	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m³	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m³	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m³	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	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 construction, earthworks and trackout have determined (before mitigation is applied).

Table 13-7 to 13-9 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 13-7 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 13-8 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 Risk

Table 13-9 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. In the absence of any site-specific information, a higher risk category has been applied to represent a worst-case scenario.

The risk of dust soiling and the impact on human health before mitigation, is summarised in Section 13.9.

13.5.1.2 Construction Phase Traffic Emissions

Construction vehicles and machinery during this phase will temporarily and intermittently generate exhaust fumes and consequently potential emissions of volatile organic compounds, nitrogen oxides, sulphur oxides, and particulate matter (dust). Dust emissions associated with vehicular movements are largely due to the resuspension of particulate materials from ground disturbance. According to the IAQM (2024), experience from the assessment of exhaust emissions from on-site machinery and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. Air pollutants may increase marginally due to construction-related traffic and machinery from the proposed development. However, any such increase is not considered significant and will be well within relevant ambient air quality standards. According to TII (2011), the significance of impacts due to vehicle emissions during the Construction Phase will be dependent on the number of additional vehicle movements, the proportion of HGVs and the proximity of sensitive receptors to site access routes. If construction traffic would lead to a significant change (> 10%) in Annual Average Daily Traffic (AADT) flows near to sensitive receptors, then concentrations of nitrogen dioxide, PM₁₀ and PM_{2.5} should be predicted in line with the methodology as outlined within TII guidance. Construction traffic is not expected to result in a significant change (> 10%) in AADT flows near to sensitive receptors (see Volume 3 – Appendices for construction phase AADTs). Therefore, a detailed air quality assessment is not required.

13.5.2 Operational Phase

13.5.2.1 Traffic-Related Emissions

Operational Phase traffic impact assessment involved air dispersion modelling using the UK Design Manual for Roads and Bridges Screening Model (DMRB, UK Highways Agency 2007) (Version 1.03c), the NO_x to NO₂ Conversion Spreadsheet (UK Department for Environment, Food and Rural Affairs, 2017), and following all relevant guidance (TII, 2011; HA, 2007; EPA; UK DEFRA; IAQM).

In terms of associated impacts on air quality, Table 13-10 outlines the typical criteria that are pre-requisite for an air quality assessment:

Table 13-10 Indicative Criteria for Requiring an Air Quality Assessment (Source: IAQM, 2017)

Potential Change Resulting from Proposed Development	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors	A change of LDV flows of more than 1000 Annual Average Daily Traffic (AADT)
Cause a significant change in Heavy Duty Vehicle (HGV) flows on local roads with relevant receptors	A change of HGV flows of more than 100 Annual Average Daily Traffic (AADT)
Cause a change in Daily Average Speed (DAS)	Where the change is 5m or more
Cause a change in peak hour speed	Where the peak hour speed will change by 20km/h or more

The UK Highways Agency Design Manual for Roads and Bridges (DMRB) air quality guidance (LA 105) provides a framework for assessing, mitigating, and reporting the effects of road schemes on air quality; however, this can be adapted to any development which results in a change in traffic.

The criteria as set out in Table 13-11 have been used to determine the project's risk potential to the receiving environment, and whether a simple or detailed air quality assessment is required. If the receiving environment is determined to be of low sensitivity, then the project's risk potential is low.

Table 13-11 Receiving Environment Sensitivity (Source: DMRA LA 105)

Sensitivity	Features of Receiving Environment
High	1) Large number of receptors (human and / or ecological) within 50m of roads triggering traffic screening criteria; 2) Baseline monitoring data indicates concentrations above the AQS Objective / EU limit value; 3) Monitoring indicates exceedances of short term AQS Objectives / EU limit value; 4) Projecting forward monitored concentrations to the opening year, indicates exceedances of AQS Objectives / EU limit value; 5) AQMA's or reported EU limit value exceedances within project's study area.
Medium	1) Receptors (human or ecological) within 50m of roads triggering traffic change criteria; 2) Baseline monitoring data illustrates annual mean NO ₂ concentrations >36µg/m ³ ; 3) Projections indicate annual mean NO ₂ concentrations >36µg/m ³ in opening year; 4) AQMA's or EU limit value exceedances within project's study area.
Low	1) Few receptors located close to roads triggering traffic change criteria; 2) Baseline monitoring data illustrates concentrations in base year below an annual mean of 36µg/m ³ ; 3) No AQMA's or EU limit value exceedances within project's study area.

The baseline pollutant concentrations are well below an annual mean of 36 µg/m³ and there are no exceedances of EU limit values within the study area. Therefore, in accordance with Table 13-11, it is considered that the receiving environment of the proposed development is of a 'Low Sensitivity' and the inclusion of the proposed development can be considered low risk. Therefore, in line with DMRB LA 105 guidance, it has been determined that simple air quality assessment is required in this case.

13.5.2.1.1 UK Design Manual for Roads and Bridges Screening Model (V. 103C 2007)

The impact of the Operational Phase of the proposed development has been assessed by use of the UK DMRB screening model (Version 1.03c 2007). The DMRB screening model provides a simple and straightforward means of predicting pollutant concentrations associated with road traffic emissions from the proposed development. According to Transport Infrastructure Ireland Guidelines (TII, 2011), this method is a suitable approach in circumstances where the predicted environmental concentrations (i.e., ambient background + predicted concentration) lie sufficiently below the air quality standards (<90% of the standard). Where predicted concentrations approach or exceed the air quality standards/limit values, a detailed air quality assessment must be carried out.

The DMRB modelling tool requires the following inputs to complete the assessment: road types, receptor locations, annual average daily traffic movements (AADT), percentage heavy goods vehicles (%HGV), annual traffic speeds and background pollutant concentrations. This input data is utilised by the model in predicting the proposed development's road traffic contribution to ambient ground level concentrations at the nearest affected sensitive air quality receptor. The DMRB modelling tool predicts annual mean concentrations of NO_x and PM₁₀. The road NO_x concentration is then converted to NO₂ using the latest-available version of the UK Department for Environment, Food and Rural Affairs (DEFRA) NO_x to NO₂ conversion spreadsheet (version 8.1). Concentrations of carbon monoxide (CO) and benzene (Bz) are consistently and significantly below their air quality limit values, even in urban centres, therefore modelling of these pollutants is no longer necessary (EPA Annual Air Quality Reports).

As the tool does not account for electric or hybrid vehicle use, vehicle emissions applied in this study are likely to overestimate the actual vehicle emissions experienced from the proposed development. The worst-case scenario contributions predicted by the tool are added to the existing background concentration to provide a worst-case scenario predicted ambient concentration.

13.5.2.1.1.1 Traffic Generation

The estimated vehicle trips that will be generated by the proposed development has been estimated by MHL and Associates Ltd; A full copy of the annual average daily traffic (AADT) generated during the Operational Phase of the proposed development can be found in Volume 3 - Appendices. Table 13-12 shows the AADTs from one road which will have change of Light Duty Vehicle (LDV) flows of more than 1000 Annual Average Daily Traffic (see Table 13-10 for the typical criteria that are prerequisite for an air quality assessment).

Three different year scenarios are presented in Table 13-12 for the Operational Phase vehicle trip generation data. The Baseline Year Scenario (2024), the Opening Year 'Do Minimum' and 'Do Something' scenarios (2026) and the Design Year (which is Opening Year plus 15 years, as per TII Guidance) (2041).

Table 13-12 Traffic Data Applied to the DMRB Model

Link Number	Road Name	Base Year AADT (2024)	Opening Year (2026)		Design Year (2041)		Speed (Km/h)
			Do Nothing	Do Something	Do Nothing	Do Something	
			AADT	AADT	AADT	AADT	
1	Mountain Road / Development Access	1,500 (3% HGV)	1,556 (3.1% HGV)	4,526 (3.1% HGV)	1,794 (3.6% HGV)	4,820 (3.1% HGV)	50
2	Mountain Road/ R611	6,500 (2.9% HGV)	6,741 (3.0% HGV)	9,220 (3.0% HGV)	7,774 (3.5% HGV)	10,494 (3.0% HGV)	50
3	R611/Forest Road Signalised Junction	7,000 (2.5% HGV)	7,259 (2.6% HGV)	9,270 (2.6% HGV)	8,372 (3.0% HGV)	10,642 (2.6% HGV)	50
4	R611/Pottery Road Signalised Junction	7,100 (1.9% HGV)	7,363 (2.0% HGV)	8,528 (2.0% HGV)	8,492 (2.3% HGV)	9,920 (2.0% HGV)	50

13.5.2.1.1.2 Sensitive Receptors

TII (2011) define sensitive receptor locations as: residential housing, schools, hospitals, places of worship, sports centres, and shopping areas, i.e., locations where members of the public are likely to be regularly present. According to the DMRB LA 105 guidance, sensitive receptors shall be chosen within 200m of the Affected Road Network (ARN) (i.e., the link roads listed in Table 13-12) and include residential properties, schools and hospitals for the assessment of annual mean air quality thresholds. Where there is a risk of the short-term air quality thresholds being exceeded, then sensitive receptor locations including gardens and playing fields shall be assessed. In the current assessment, 6 high-sensitivity receptors (residential properties) were identified within 200m of the ARN.

According to the DMRB LA 105 guidance, it is not necessary to model all receptors within 200m or an excessive number of receptors in the same area to determine whether there is likely to be any exceedances in the do minimum or do something scenarios.

For the purpose of determining local air quality impacts, 6 receptors were included in this modelling assessment. The receptors modelled will represent the worst-case location in the vicinity the proposed development and was chosen based on proximity (within 200m) to the road links affected by the proposed development:

Table 13-13 Sensitive Receptors

Name	Type	ITM Coordinates	
		X	Y
R1	Residential	571908	561492
R2	Residential	572035	561735
R3	Residential	571999	561904
R4	Residential	572082	562079
R5	Residential	572250	562108

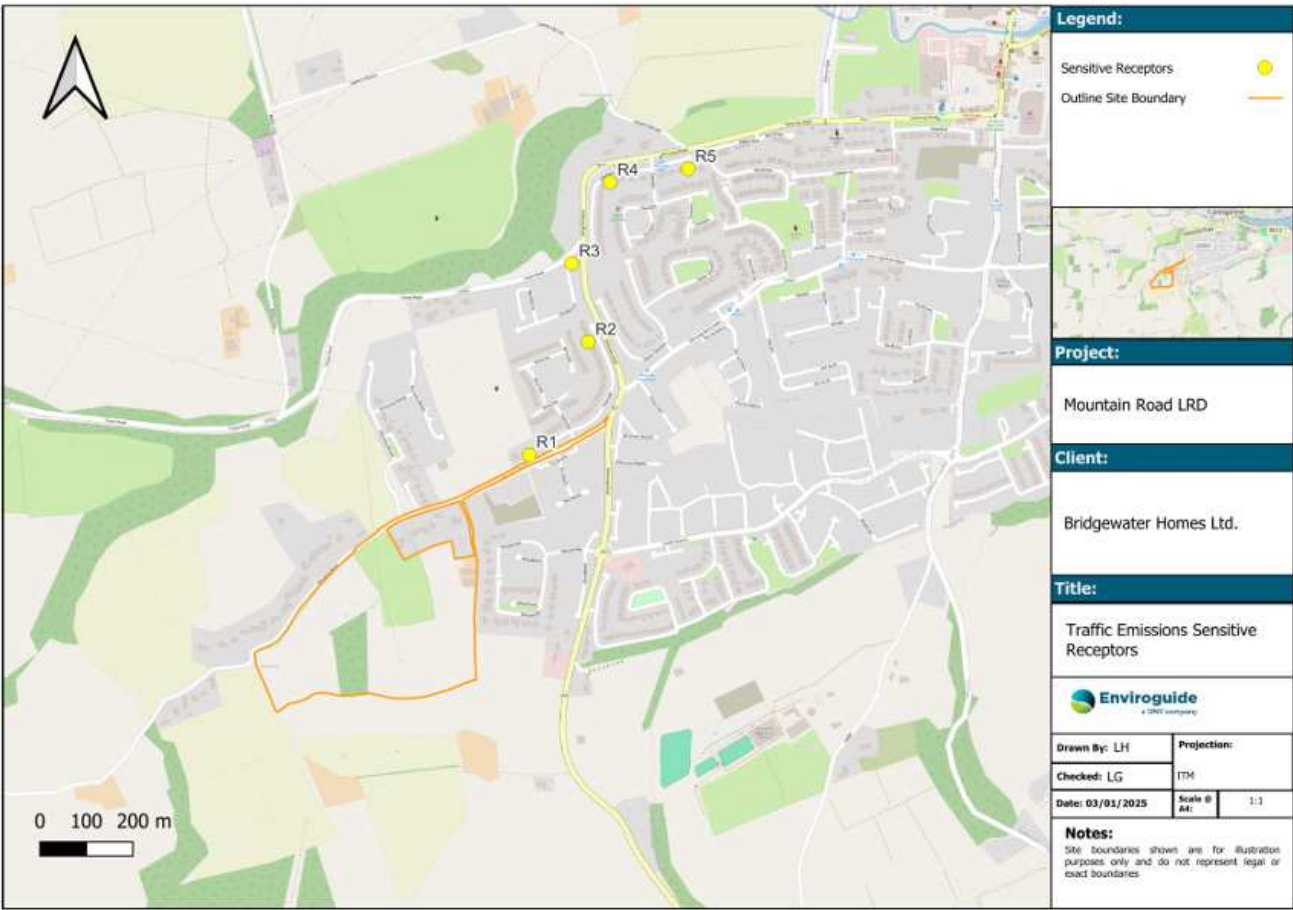


Figure 13-7 Sensitive Receptor Map

Designated sites of ecological conservation importance within 200m of the ARN are required to be included in the air quality assessment. This includes Special Protection Areas, Special Areas of Conservation, Natural Heritage Areas, and nature reserves. Only sites that are sensitive to nitrogen deposition should be included in the assessment, it is not necessary to include sites such as those which have been designated as a geological feature or water course. No sites of ecological conservation importance have been identified within 200m of the ARN; therefore, this analysis has been excluded in the current assessment.

13.5.2.1.1.3 Pollutants and Background Concentrations

The DMRB modelling tool predicts annual mean concentrations of NO_x and PM₁₀. The road NO_x concentration has then been converted to NO₂ using the latest published version of DEFRA's NO_x to NO₂ conversion spreadsheet (version 8.1). Concentrations of carbon monoxide (CO), and benzene (Bz) are consistently and significantly below their air quality limit values, even in urban centres, therefore modelling of these pollutants is no longer necessary (EPA Annual Air Quality Reports). According to the DMRB LA 105 guidance, it is only necessary to model PM₁₀ for the base year to demonstrate that there is no impact on achievements of the PM₁₀ air quality thresholds as a result of the project. Where air quality monitoring indicates exceedances of the PM₁₀ air quality thresholds in the base year, PM₁₀ should then be included in the model for both the 'do nothing' and 'do something' scenarios. As Ireland currently meets its legal requirements for the achievement of the PM_{2.5} air quality thresholds, there is no requirement to model this parameter. Additionally, the modelling of PM₁₀ can be used to demonstrate that the project does not impact on the PM_{2.5} air quality threshold.

Annual mean of NO₂ and PM₁₀ for the years 2022 and 2023 have been obtained for Zone B Stations (see Section 13.7.1). For both parameters, annual limits are well below the threshold limits contained within the regulations.

Background concentrations for the opening year (2026) and design year (2041) have been predicted for the air quality assessment. Baseline year (2024) background concentrations have been used in combination with correction factors to estimate annual average NO₂ concentrations in future years. These factors have been adapted from both TII (2011) and DEFRA roadside NO₂ projection factors.

Adjustments to the verified modelled NO₂ concentrations are required to be made in order to account for future roadside NO₂ concentrations. An additional scenario known as the projected base year is to be included in the air quality modelling to enable a gap analysis to be completed. The gap analysis is the application of adjustment factors which take into consideration the assumed roadside rates of reduction in NO_x and NO₂ by DEFRA's modelling tools compared to observed roadside monitoring trend i.e., the gap between the predicted reductions and those observed (DMRB LA 105 guidance). This methodology has been applied to the current assessment in order to predict future NO₂ concentrations as a result of the proposed development and ensure that these concentrations are not underestimated.

13.5.2.1.1.4 Determining the Impact

The TII guidance document 'Guidelines for the Treatment of Air Quality during the Planning and Construction of Road Schemes (2011)' outlines a clear methodology for determining the magnitude and significance of air quality impacts associated with road schemes; however, this remains applicable to any project which results in a change to traffic volumes. The TII significance criteria have been applied to the proposed development and adapted as necessary within Tables 13-14 to 13-17.

Tables 13-14 to 13-17 describe the air quality impacts at each receptor. They are applicable to the pollutants which are relevant to the proposed development and the standards or limit values against which they are being assessed (TII, 2011). The criteria focus on NO₂ and PM₁₀ as these pollutants are most likely to exceed the annual mean limit values (40 µg/m³).

The definition of 'impact magnitude' is related to the degree of change in pollutant concentrations, expressed as micrograms per cubic metre (µg/m³). 'Impact description' takes account of the impact magnitude and of the absolute concentrations and how they are linked to the air quality standards or limit values. The descriptors for the magnitude of change due to the proposed development are set out in Table 13-14:

Table 13-14 Definition of Impact Magnitude for Changes in Ambient Pollutant Concentrations (Source: Adapted from TII, 2011)

Magnitude of Change	Annual Mean NO ₂ /PM ₁₀	No. of Days with PM ₁₀ Concentration Greater Than 50 µg/m ³
Large	Increase/decrease ≥4 µg/m ³	Increase/decrease >4 days
Medium	Increase/decrease 2 - <4 µg/m ³	Increase/decrease 3 or 4 days
Small	Increase/decrease 0.4 - <2 µg/m ³	Increase/decrease 1 or 2 days
Imperceptible	Increase/decrease <0.4 µg/m ³	Increase/decrease <1 day

The subsequent impact descriptors are set out in Table 13-15 and Table 13-16.

Table 13-15 Air Quality Impact Descriptors for Changes to Annual Mean NO₂ and PM₁₀ Concentrations at Receptors (Source: Adapted from TII, 2011)

Absolute Concentration in Relation to Objective/ Limit Value	Change in Concentration ⁸		
	Small	Medium	Large
Increase with Scheme			
Above Objective/Limit Value with Scheme (≥40 µg/m ³ of NO ₂ or PM ₁₀)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value with Scheme (36-<40 µg/m ³ of NO ₂ or PM ₁₀)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value with Scheme (30-<36 µg/m ³ of NO ₂ or PM ₁₀)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value with Scheme (<30 µg/m ³ of NO ₂ or PM ₁₀)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value with Scheme (≥40 µg/m ³ of NO ₂ or PM ₁₀)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value with Scheme (36-<40 µg/m ³ of NO ₂ or PM ₁₀)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value with Scheme (30-<36 µg/m ³ of NO ₂ or PM ₁₀)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value with Scheme (<30 µg/m ³ of NO ₂ or PM ₁₀)	Negligible	Negligible	Slight Beneficial

8 Where the impact magnitude is Imperceptible, then the impact description is negligible.

Table 13-16 Air Quality Impact Descriptors for Changes to Annual Mean NO₂ and PM₁₀ Concentrations at Receptors (Source: Adapted from TII, 2011)

Absolute Concentration in Relation to Objective/ Limit Value	Change in Concentration ⁹		
	Small	Medium	Large
Increase with Scheme			
Above Objective/Limit Value with Scheme (≥35 days)	Slight Adverse	Moderate Adverse	Substantial Adverse
Just Below Objective/Limit Value with Scheme (32-<35 days)	Slight Adverse	Moderate Adverse	Moderate Adverse
Below Objective/Limit Value with Scheme (26-<32 days)	Negligible	Slight Adverse	Slight Adverse
Well Below Objective/Limit Value with Scheme (<26 days)	Negligible	Negligible	Slight Adverse
Decrease with Scheme			
Above Objective/Limit Value with Scheme (≥35 days)	Slight Beneficial	Moderate Beneficial	Substantial Beneficial
Just Below Objective/Limit Value with Scheme (32-<35 days)	Slight Beneficial	Moderate Beneficial	Moderate Beneficial
Below Objective/Limit Value with Scheme (26-<32 days)	Negligible	Slight Beneficial	Slight Beneficial
Well Below Objective/Limit Value with Scheme (<26 days)	Negligible	Negligible	Slight Beneficial

In terms of ‘significance of effects’, professional judgment has been applied in making this determination. The TII Guidance (2011) outlines that the overall air quality impact of the proposed development should be described as either ‘insignificant’, ‘minor’, ‘moderate’, or ‘major’; and a number of factors, as listed in Table 13-17, are set out which should be taken into account:

Table 13-17 Factors to Consider when Determining Air Quality Significance (Source: Adapted from TII, 2011)

Factors
Number of people affected by increases and/or decreases in concentrations and a judgement on the overall balance.
The number of people exposed to levels above the objective or limit value, where new exposure is being introduced.
The magnitude of the changes and the descriptions of the impacts at the receptors i.e., using the findings based on Boxes Tables 13-14 to 13-16.
Whether or not an exceedance of a standard or limit value is predicted to arise in the study area where none existed before or an exceedance area is substantially increased.
Whether or not the study area exceeds a standard or limit value and this exceedance is removed, or the exceedance area is reduced.
Uncertainty, including the extent to which worst-case assumptions have been made.
The extent to which a standard or limit value is exceeded, e.g., an annual mean NO ₂ of 41 µg/m ³ should attract less significance than an annual mean of 51 µg/m ³ .

9 Where the impact magnitude is Imperceptible, then the impact description is negligible.

The modelling results are discussed in Section 13.9 of this chapter.

13.5.2.2 Operational Plant and Machinery

A Climate Action and Energy Statement has been prepared for the proposed development by OSL Bulter Consulting Engineers (2025). The sustainable and energy strategy for the site will employ an approach that will demonstrate how the proposed development can achieve Nearly Zero Energy Building (NZEB) compliance based on the Part L 2022 Building Regulations.

The crèche building will comply will be designed with “Technical Guidance Part L 2022 Buildings other than Dwellings”, which will include to limit the calculated primary energy consumption and related carbon dioxide emissions to Nearly Zero Energy Building (NZEB) level insofar as possible, when both energy consumption and carbon dioxide emissions are calculated using Non-domestic Energy Assessment (NEAP) published by Sustainable Energy Authority of Ireland (SEAI).

The strategy approach to the design of the proposed development is firstly, where feasible, to maximise the passive measures of the building (improved insulation, solar gains, daylight etc) and then apply the most efficient active measures (heat pumps, LED lighting controls etc). The passive measures to be included in the design contribute towards reducing the loads on the active systems within the building. The active measures will be designed to reduce the primary energy consumption through intelligent control and highly efficient plant and equipment.

The following renewable energy sources (or similar) will be considered for the proposed development during the detailed design stage to achieve a more energy efficient (i.e., less carbon intensive) design, if deemed technically, environmentally and economically feasible:

- Ground source heat pumps (GSHP) closed loop;
- Air source heat pump (ASHP);
- Exhaust air heat pump (EAHP);
- Combined heat and power (CHP); and
- Solar photovoltaic.

The most feasible technologies currently that will achieve the criteria for NZEB is the use of PV solar panels, exhaust air heat pumps, air source heat pumps on their own or in combination, based on the final development design.

The following points related to embodied carbon will be considered for the proposed development:

- Reduce the weight of equipment. Specify products that can be demounted and reused. Specify products with long lifespans;
- Mitigate refrigerant impact through low refrigerant Global Warming Potential (GWP) and leakage rates;
- Plant should be easily accessible for inspection, maintenance and replacement;
- Design with adaptation in mind;
- Less is more, design out mechanical, electrical and pumping (MEP) where feasible;
- Source local materials where possible; and
- Source materials with an Environmental Product Declaration (EPD) where possible.

The building fabric standards and technology will be assessed in greater detail during the detailed design stage and the most appropriate options will be implemented. Plant and machinery will not cause any likely significant air quality or climate effects due to the implementation of such measures as those listed.

13.6 Difficulties Encountered

No difficulties have been encountered while compiling this chapter.

13.7 Baseline

13.7.1 Air Quality

According to the 2012 Regulations (S.I. No. 326 of 2012) 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).

Table 13-18 Concentrations of NO₂ at Zone B Monitoring Stations

Station	Objective	Concentration (µg/m³)		Limit or Threshold Value
		2022	2023	
South Link Road	Annual Mean NO ₂ ¹⁰	17.9	15.0	40 µg/m³
	Days >200µg/m³	0	0	35 days
UCC Distillery Fields	Annual Mean NO ₂	9.0	7.6	40 µg/m³
	Days >200µg/m³	0	0	35 days
Cork Mallow	Annual Mean NO ₂	15.8	13.3	40 µg/m³
	Days >200µg/m³	0	0	35 days
Cork Glanmire Rd	Annual Mean NO ₂	32.1	23.0	40 µg/m³
	Days >200µg/m³	0	0	35 days

10 NO₂ annual mean limit value for the protection of human health: 40 µg/m³ per station

Based on the data summarised in Table 13-18, existing baseline air quality for the area in which the site is located can 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 ug/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 ug/m³ across all Zone B stations, with no exceedance of the maximum hourly limit (EPA, 2024).

The closest representative suburban background monitoring to the site which continuously monitors for concentrations of nitrogen oxides (NO₂) and particulate matter (PM_{2.5} and PM₁₀) is located on the South Link Road on the south side of Cork City (ca. 9.10km northwest 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 South Link Road monitoring station, with an annual mean of 17.9 ug/m³ and 15.0 ug/m³ and measured in 2022 and 2023, respectively (EPA, 2023; EPA, 2024).

EPA 2023 background concentrations for South Link Road have been used in combination with correction factors to estimate base year (2024) annual average NO₂ concentrations in the region of the proposed development. These factors have been adapted from both TII (2011) and DEFRA roadside NO₂ projection factors. Based on these correction factors, the estimated baseline year (2024) background NO₂ concentration in the region of the proposed development is 14.1 µg/m³.

Table 13-19 Concentrations of PM₁₀ at Zone B Monitoring Stations

Station	Objective	Concentration (µg/m³)		Limit or Threshold Value
		2022	2023	
South Link Road ¹¹	Annual Mean PM ₁₀ ¹²	15.8	-	40 µg/m³
	Days >50µg/m³ ¹³	2	-	35 days
Heatherton Park	Annual Mean PM ₁₀	11.9	11.0	40 µg/m³
	Days >50µg/m³	0	1	35 days
Bishopstown MTU	Annual Mean PM ₁₀	14.4	11.4	40 µg/m³
	Days >50µg/m³	1	0	35 days
Cork Glanmire Rd	Annual Mean PM ₁₀	14.1	13.2	40 µg/m³
	Days >50µg/m³	0	2	35 days
Cork Airport	Annual Mean PM ₁₀	-	12.1	40 µg/m³
	Days >50µg/m³	-	0	35 days
Cork Port	Annual Mean PM ₁₀	-	12.3	40 µg/m³
	Days >50µg/m³	-	0	35 days

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 µg/m³ per station
13 PM₁₀ daily limit for the protection of human health: No more than 35 days in a year >50 µg/m³ per station

Measured concentrations of PM₁₀ for the years 2022 and 2023 are presented in Table 13-19 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 11.0 – 13.2 ug/m³ across all Zone B stations, with no exceedance of short-term limit values (EPA, 2024).

Concentrations of PM₁₀ at South Link Road monitoring station are also well below their respective limit values with an annual mean of 15.8 ug/m³ measured in 2022 (EPA, 2023).

EPA 2022 background concentrations for South Link Road have been used in combination with correction factors to estimate base year (2024) annual average PM₁₀ concentrations in the region of the proposed development. These factors have been adapted from both TII (2011) and DEFRA roadside NO₂ projection factors. Based on these correction factors, the estimated base year (2024) background PM₁₀ concentration in the region of the proposed development is 15.7 µg/m³.

13.7.2 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.

13.7.3 Microclimate

The synoptic meteorological station at Cork Airport is located approximately 7km northwest 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.

13.7.3.1 Rainfall

Rainfall is a key indicator of changes in climate, as measurements of rainfall are fundamental to assessing the effects of climate change on the water cycle and water balance. Table 13-20 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 13-20 Monthly Rainfall Values (mm) for Cork Airport Weather Station from January 2021 to December 2024 (Source: Met Eireann)

Year	Jan	Feb	March	April	May	June	July	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	76.6	1267.7
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

13.7.3.2 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 13-8 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 30 years. Wind speeds of 7 knots have the highest frequency, occurring approximately 8.5% of the time.

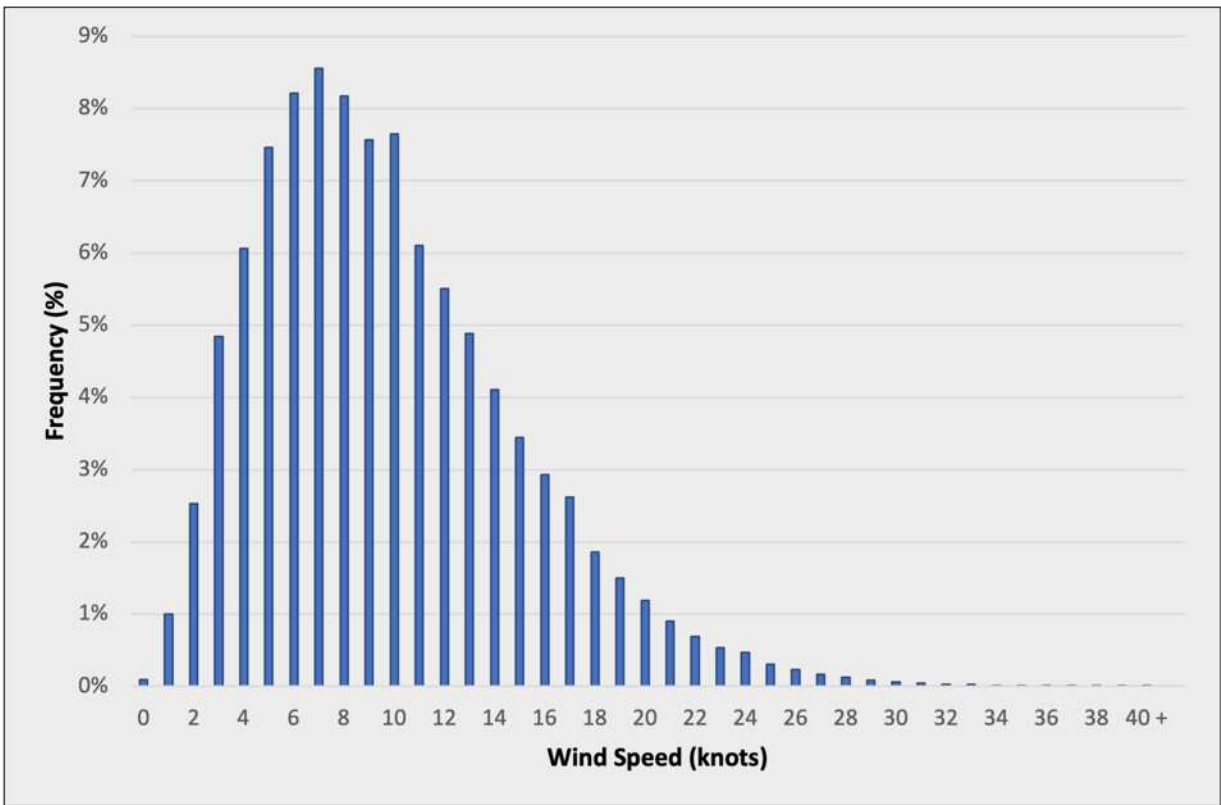


Figure 13-8 Wind Speed Frequency Distribution at Cork Airport Synoptic Weather Station over 30 years (1992-2021)

Figure 13-9 provides a wind rose of the predominant wind directions and associated wind speeds at Cork Airport. As is visible from Figure 13-9, 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.

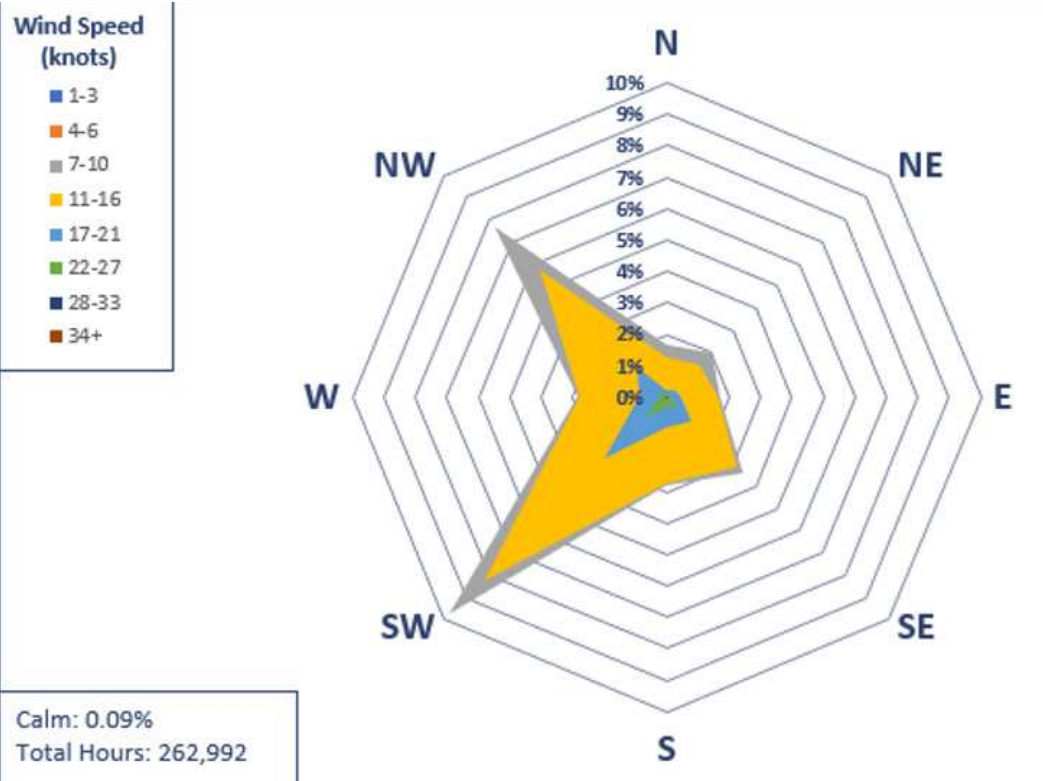


Figure 13-9 30-year Windrose at Cork Airport Synoptic Weather Station 1992-2021 (Developed using Met Eireann Hourly Data)

13.8 The ‘Do Nothing’ Scenario

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). Therefore, the do-nothing scenario is considered neutral in terms of air quality and climate.

13.9 Potential Significant Effects

13.9.1 Potential Impact on Air Quality

13.9.1.1 Construction Phase

13.9.1.1.1 Dust

There is the 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 13.4 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 13-21.

Table 13-21 Dust Emission Magnitude for the Site

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Large
Construction	Large
Trackout	Large

Sensitivity of the Area (Step 2B)

Table 13-22 Sensitivity of the Area

Sensitivity Type	Factors	Sensitivity of the 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 2022 background concentrations for Zone B 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) projection factors. Based on these correction factors, the estimated baseline year (2024) background PM ₁₀ concentration in the region of the Proposed Development is 15.6 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.	Low	Low
Ecology	Not applicable – no ecological receptors within the study area.		

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 13-23 details the risk of dust impacts for demolition, earthworks, construction and trackout activities.

Table 13-23 Summary of Unmitigated Risks

Potential Impact	Sensitivity	Magnitude			
		Demolition	Earthworks	Construction	Trackout
		Small	Large	Large	Large
Dust Soiling Impacts	High	Medium Risk	High Risk	High Risk	High Risk
Human Health Impacts	Low	Negligible	Low Risk	Low Risk	Low Risk
Ecological Impacts	Not applicable – no ecological receptors within the study area.				

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 13.10 of this chapter (Step 3 as per the IAQM Guidance on the Assessment of Dust from Demolition and Construction (2024) (see Section 13.4 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 13.4 may be applied as part of good practice.

13.9.1.2 Operational Phase

13.9.1.2.1 Traffic Emissions

The DMRB LA 105 guidance has been outlined in Section 13.5 of this chapter; in accordance with Table 13-11, it is considered that the receiving environment of the proposed development is of a ‘Low Sensitivity’ and the inclusion of the proposed development can be considered low risk. Therefore, it has been determined that a simple air quality assessment is required in this case, as per Table 13-24.

Table 13-24 Table for Determination of Simple or Detailed Assessment (Source: DMRB LA 105 Guidance)

Risk Potential of Project	Receiving Environment Sensitivity			
	Risk	High	Medium	Low
	High	Detailed	Detailed	Simple
	Low	Simple	Simple	Simple

13.9.1.2.1.1 Modelling Results

The impact of the proposed development has been determined by modelling traffic-related air emissions resulting from the presence (Do-Something Scenario) or absence (Do-Nothing Scenario) of the proposed development.

Table 13-25 Modelled Baseline NO₂ and PM₁₀ Concentrations (2024)

Receptor	ITM Coordinate	Receptor Type	Parameter	Total (µg/m ³)	Road Traffic Component
R1	571908, 561492	Residential	PM ₁₀	15.79	0.09
			NO ₂	14.52	0.42
R2	572035, 561735	Residential	PM ₁₀	16.06	0.36
			NO ₂	15.78	1.68
R3	571999, 561904	Residential	PM ₁₀	16.20	0.50
			NO ₂	16.43	2.33
R4	572082, 562079	Residential	PM ₁₀	16.09	0.39
			NO ₂	15.85	1.75
R5	572250, 562108	Residential	PM ₁₀	15.93	0.23
			NO ₂	15.12	1.02

Concentrations of NO₂ and PM₁₀ were modelled for the baseline year of 2024. As presented in Table 13-25, the model has indicated that concentrations for all pollutants achieved levels in compliance with the annual limit of 40 µg/m³. Therefore, in line with DMRB LA 105 guidance, further modelling of PM₁₀ for the opening and design years is not required. The highest road increment of PM₁₀ experienced at receptors was 0.50 µg/m³ (at R3). When this is assessed in combination with the 2024 background concentration levels of 15.7 µg/m³ (total µg/m³ is 16.20 µg/m³) an overall impact of 40.5% of the annual limit (40 µg/m³) is experienced at the worst-case receptor.

Table 13-26 Predicted Annual Mean Concentrations of NO₂ (Opening Year 2026)

Receptor	Background (µg/m ³)	Opening Year (2026)				
		Do Nothing	Do Something	Proposed Development Contribution	Magnitude	Impact Descriptor
R1	12.5	12.94	13.72	0.78	Small	Negligible Increase
R2		14.25	14.97	0.72	Small	Negligible Increase
R3		14.93	15.73	0.8	Small	Negligible Increase
R4		14.33	14.71	0.38	Imperceptible	Negligible Increase
R5		13.57	13.74	0.17	Imperceptible	Negligible Increase

Table 13-27 Predicted Annual Mean Concentrations of NO₂ (Design Year 2041)

Receptor	Background (µg/m ³)	Design Year (2041)				
		Do Nothing	Do Something	Proposed Development Contribution	Magnitude	Impact Descriptor
R1	6.3	6.83	7.62	0.79	Small	Negligible Increase
R2		8.41	9.13	0.72	Small	Negligible Increase
R3		9.22	10.02	0.8	Small	Negligible Increase
R4		8.48	8.88	0.4	Small	Negligible Increase
R5		7.57	6.98	-0.59	Small	Negligible Decrease

The impact of the proposed development on annual mean NO₂ concentrations in the opening year (2026) and design year (2041) has been assessed relative to the 'Do Nothing' levels. The results shown in Table 13-26 and 13-27 determine that there may be 'imperceptible' and 'small' increases in concentrations of NO₂ at receptors when compared with 'Do Nothing' levels; with the highest predicted increase of 0.8 µg/m³ measured at R3 in the opening year and design year 'Do Something' scenarios.

In accordance with Table 13-15, when assessing the proposed development contribution in relation to the NO₂ objective/limit value, concentrations of NO₂ at all sensitive receptors are less than 16 µg/m³ with the inclusion of the proposed development in both the opening and design years, and as such, are well below the objective/limit value of 40 µg/m³. Therefore, it is considered that the impact of the proposed development is minor at sensitive receptors and not significant in terms of overall ambient air quality standards.

Having regard to the assessment criteria set out in Section 13.5 and the modelling results outlined in Table 13-26 and Table 13-27, the impact of the proposed development on NO₂ concentrations in the locality is likely to be 'long-term', 'negative' and 'imperceptible'.

13.9.2 Potential Impact on Climate

13.9.2.1 Construction Phase

There is the potential for combustion emissions from onsite machinery and traffic derived pollutants of CO₂ and Nitrous Oxide (N₂O) to be emitted during the construction phase of the development. However, due to the size and duration of the Construction Phase, the effect on national GHG emissions will be insignificant in terms of Ireland's obligations under the Paris Agreement. The Contractor will seek to achieve the greatest standards of sustainable construction and design and will incorporate sustainable design criteria from the outset which supports overall climate change mitigation. The following mitigation measure will further reduce the effect on national GHG emissions:

- Ensure all vehicles switch off engines when stationary - no idling vehicles; and
- Avoid the use of diesel- or petrol-powered generators and use mains electricity or battery powered equipment where practicable.

13.9.2.2 Operational Phase

13.9.2.2.1 Flood Risk

A Site-Specific Flood Risk Assessment (SSFRA) was undertaken by OSL Butler Consulting Engineers (2025). The following is a summary of the SSFRA:

- The site including all proposed residential dwellings is located in Flood Zone C as defined by the requirements of "The Planning System and Flood Risk Management, Guidelines for Planning Authorities" and its Technical Appendices;
- Following the Flood Risk Assessment Stage 2 (Initial Flood Risk Assessment), it was determined that a Justification Test was not required;
- To prevent any potential of flooding within the vicinity from the proposed development, it is proposed to implement Sustainable Drainage Systems (SuDS) measures as discussed in the Infrastructure Report and Drainage Impact Assessment in order to limit the discharge from the site to the current discharge rates. The implementation of these SuDS measures will not increase the risk of flooding elsewhere; and
- It is considered by OSL Butler Consulting Engineers that the proposed development will have a negligible impact on the potential flood regime of the area.

OSL Butler Consulting Engineers concluded that the proposed development is considered to have the required level of flood protection up to and including the 1% Annual Exceedance Probability (AEP) storm event.

The full SFRA Report has been submitted as a standalone document as part of this planning application.

13.9.2.2.2 Energy Statement

Building energy has been long understood as contributing a major component of GHG emissions which was acknowledged within the 2030 Communication published by the European Commission (2014) which stated that "the majority of the energy-saving potential (for the EU) is in the building sector. The EU Energy Performance of Buildings Directive set out the target that all new developments should be Nearly Zero-Energy Buildings (NZEB) by the end of 2020.

A Climate Action and Energy Statement has been prepared for the proposed development by OSL Butler Consulting Engineers (2025). The sustainable and energy strategy for the site will employ an approach that will demonstrate how the proposed development can achieve Nearly Zero Energy Building (NZEB) compliance based on the Part L 2022 Building Regulations.

In developing the energy strategy for the proposed development, the incorporation of energy efficient strategies into the project deliverables will encourage the commitment to sustainable design at a very early stage and ensure that the proposed development will meet the principles of the Government’s ‘National Climate Change Policy’ and the Nearly Zero Energy Building (NZEB) criteria as set out in the Part L Regulations 2022 and will maximise the reduction in Carbon Dioxide (CO₂) emissions thus demonstrating the commitment to climate change.

The full Climate Action and Energy Statement has been submitted as a standalone document as part of this planning application.

13.9.2.2.3 Traffic

There will be an increase in LDV and HGV traffic flow on the local road network as a result of the proposed development is likely to contribute to increases in GHG emissions such as CO₂ and Nitrous Oxide (N₂O). However, these contributions are likely to be marginal in terms of overall national GHG emission estimates and Ireland’s obligations under the Paris Agreement, and therefore unlikely to have an adverse effect on climate.

13.9.3 Cumulative Effects

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.

Cumulative air quality impacts have the potential to arise locally when construction activities associated with the proposed development take place at the same time as other developments in a specific location.

A review of other off-site developments was completed as part of this assessment. Chapter 1 of this EIAR details the relevant permitted planning permissions in the area, a review of these planning permissions has been completed as part of this assessment.

The potential impacts on air quality and climate are assessed in Section 13.9 and it is considered that there are no other potential significant cumulative impacts associated with the proposed development and considered offsite permitted developments.

In terms of dust, no significant impacts are predicted; good construction practice, which incorporates the implementation of the identified mitigation measures, will be employed at the proposed development site. Due to the implementation of good construction practices at the site of the proposed development and these offsite permitted developments, it is not anticipated that significant cumulative impacts will occur.

Assessment of operational stage impacts on air quality involved traffic data which is inclusive of traffic associated with other existing and permitted developments on the road networks surrounding the site both in current and future years. Therefore, cumulative impacts have been assessed in this regard and the impact on ambient air quality has been determined as insignificant.

The cumulative impact of the proposed development in relation to GHG emissions is considered direct, long-term, negative and slight, which is overall not significant in EIA terms.

Should the construction phase of the proposed development coincide with the construction phase of other local construction developments, there is the potential for cumulative dust emissions to impact the nearby sensitive receptors during the construction phases. The dust and air quality mitigation measures outlined in Section 13.10 will be applied throughout the construction phase of the proposed development and similar best practice mitigation measures are also required for the construction phase of other developments which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality and climate associated with the construction phase of the proposed development are predicted to be short-term and slight.

The operational phases of the proposed development and other permitted residential developments in the local area will not generate cumulative air emissions that will have an adverse impact on local ambient air quality. Measured baseline air quality and national published air quality data confirm that the existing air quality is good and that the operational phases of the subject development and other local proposed developments will have a long-term imperceptible impact on existing air quality.

It is considered that there are no other potential significant cumulative impacts associated with the proposed development and considered offsite permitted developments.

13.9.4 Summary

The following Table summarises the identified likely significant effects during the Construction Phase of the proposed development before mitigation measures are applied.

Table 13-28 Summary of Construction Phase Likely Significant Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Dust Nuisance	Negative	Slight	Local Area	Likely	Short-term	Direct
Traffic Emissions	Negative to Neutral	Imperceptible	Local Area	Unlikely	Short-term	Direct

The following Table summarises the identified likely significant effects during the Operational Phase of the proposed development before mitigation measures are applied.

Table 13-29 Summary of Operational Phase Likely Significant Effects in the Absence of Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Traffic Emissions	Negative to Neutral	Imperceptible	Local Area	Unlikely	Long-term	Direct

13.10 Mitigation Measures

13.10.1 Incorporated Design Mitigation

The dwellings will be required to minimise overall energy use and to incorporate an adequate proportion of renewable energy in accordance with Building Regulations Part L 2022, Conservation of Energy and Fuel. The following points related to embodied carbon will be considered for the proposed development:

- Reduce the weight of equipment. Specify products that can be demounted and reused. Specify products with long lifespans;
- Mitigate refrigerant impact through low refrigerant Global Warming Potential (GWP) and leakage rates;
- Plant should be easily accessible for inspection, maintenance and replacement;
- Design with adaptation in mind;
- Less is more, design out mechanical, electrical and pumping (MEP) where feasible;
- Source local materials where possible; and
- Source materials with an Environmental Product Declaration (EPD) where possible.

13.10.2 Construction Phase Mitigation

Communications

- Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager;
- Display the head or regional office contact information; and
- Develop and implement a Dust Management Plan (DMP), the final dust management plan will form part of the overall construction management plan which will formally be prepared and submitted to Cork County Council post grant of planning permission.

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;
- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Cork County Council when asked; 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 Demolition

- Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground;
- Avoid explosive blasting, using appropriate manual or mechanical alternatives; and
- Bag and remove any biological debris or damp down such material before demolition

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.

13.10.3 Operational Phase Mitigation

It has been determined that the Operational Phase air quality impact is negligible and therefore no site-specific mitigation measures are proposed.

13.11 Residual Impact Assessment

The IAQM recommends that significance is only assigned to effect 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 (Section 13.10 of this chapter) and the final step is to determine whether there are significant effects arising from the Construction Phase of the proposed development. The proposed mitigation measures will ensure that a potential significant adverse effect will not occur, therefore, the residual effect will not be significant.

The traffic generated by the proposed development has been assessed for its impact on air quality and it has been determined to have an overall not significant impact in terms of local air quality with the implementation of the proposed mitigation measures. Furthermore, it is considered that the effects of the proposed development on climate is considered to be not significant. Therefore, no significant adverse residual impacts are anticipated from the proposed scheme in the context of air quality and climate.

The proposed development will result in some impacts to climate through the release of GHGs. IEMA (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 incorporation of sustainable strategies into the project deliverables will ensure that the proposed development meets the principles of the Government’s ‘National Climate Change Policy’ and that it exceeds the requirements of the Building Regulations Part L 2022 and maximises the reduction in CO₂ emissions, thus demonstrating a commitment to climate change.

Therefore, no significant adverse residual impacts are anticipated from the proposed scheme in the context of air quality and climate.

13.11.1 Summary of Post-mitigation Effects

The following Table summarises the identified likely significant residual effects during the construction phase of the proposed development following the application of mitigation measures.

Table 13-30 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Dust Nuisance	Negative	Imperceptible	Local Area	Unlikely	Short-term	Direct
Traffic Emissions	Negative to Neutral	Imperceptible	Local Area	Unlikely	Short-term	Direct

The following Table summarises the identified likely residual significant effects during the Operational Phase of the proposed development post mitigation.

Table 13-31 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Traffic Emissions	Negative to Neutral	Imperceptible	Local Area	Unlikely	Long-term	Direct
Likely Significant Effect	Quality	Significance	Local Area	Probability	Duration	Type

13.11.2 Cumulative Residual Effects

It is considered that there are no other potential significant cumulative impacts associated with the proposed development and considered offsite permitted developments.

13.12 Risk of Major Accidents or Disasters

The Site-Specific Flood Risk Assessment (OSL Butler Consulting Engineers, 2025) has demonstrated that the risks relating to flooding to the proposed development can be managed and mitigated to acceptable levels and therefore comply with Department of Housing, Local Government and Heritage (DoEHLG) / OPW and Cork County Council planning guidance.

13.13 Worst Case Scenario

A worst-case scenario has been applied Step 2A (defining the potential dust emission magnitude) of the construction dust impact assessment and the highest risk category has been applied when selecting the mitigation measures that are general for the proposed development).

It is expected that adequate mitigation measures, as outlined in Section 13.10, will assist in preventing nuisance dust from resulting in any significant effects. However, even with the most rigorous 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'.

A worst-case scenario has been applied to the Operational Phase traffic emissions assessment in terms of traffic volumes experienced on the surrounding road network and associated air emissions. The worst-case contributions predicted by the tool are added to the existing background concentration to provide a worst-case predicted ambient concentration. The compliance of the proposed development with the relevant ambient air quality standards is subsequently assessed by comparison with the worst-case ambient concentrations. Associated impacts have been determined as negligible in this case.

13.14 Interactions

13.14.1 Population and Human Health

Interactions between air quality and population and human health have been considered as the proposed development has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the proposed development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as having an overall insignificant impact, therefore air quality impacts from the proposed development are not expected to have a significant impact on population and human health.

13.14.2 Land and Soils

Construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions. With the appropriate mitigation measures to prevent fugitive dust emissions, it is predicted that there will be no significant interactions between air quality and land and soils during the construction phase. There are no potentially significant interactions identified between air quality, and land, soils and hydrogeology during the operational phase.

13.14.3 Biodiversity

Interactions between air quality and biodiversity have been considered as the construction phase has the potential to interact with flora and fauna in adjacent habitats and designated sites due to dust emissions arising from the construction works. However, the mitigation measures employed at the proposed development will ensure that the impacts to flora and fauna are not significant.

13.14.4 Waste

Interactions across many areas can be used to minimise the GHG emissions from both the construction and operational phases. For instances, waste management measures will be put in place to minimise the amount of waste entering landfill, which has higher associated embodied carbon emissions than other waste management such as recycling or incineration.

13.14.5 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.

13.15 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 a 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.

Monitoring of GHG Emissions Reduction Measures

To mitigate the proposed development'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: We suggest installing GPS or telematics systems 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; and
- 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, we recommend the following monitoring protocols:

- 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; and

- Monthly Waste Management Reports: We suggest generating monthly reports 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, following measures are recommended:

- 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; and
- 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 proposed development adheres to its environmental commitments, particularly in the areas of resource recovery, waste management, and greenhouse gas emissions reduction.

Due to the negligible impact on air quality and climate from the Operational Phase of the proposed development, no specific monitoring is recommended.

13.16 Conclusion

The implementation of the mitigation measures outlined in Section 13.10 will ensure that the proposed development has an overall not significant impact in terms of local air quality and climate.

13.17 References and Sources

Air Pollution Act 2012 (S.I. No. 326 of 2012) Irish Statute Book.

Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) Irish Statute Book.

Air Quality, Clean Air for Europe Directive (2008/50/EC) EUR-Lex.

Chartered Institute of Ecology and Environmental Management (CIEEM) (2021) Advice on Ecological Assessment of Air Quality Impacts. Chartered Institute of Ecology and Environmental Management. Winchester, UK.

Climate Action and Energy Statement, OSL Butler Consulting Engineers, 2025.

Cork County Council Climate Action Plan, 2024-2029.

Department of Communications, Climate Action and Environment (DCCAE) (2017) National Mitigation Plan.

Department of Communications, Climate Action and Environment (DCCAE) (2018) National Adaptation Framework.

Department of the Environment, Transport and the Regions, 1995. The Environmental Effects of Dust from Surface Mineral

Workings- Volume 2. Technical Report.

Environmental Protection Agency (2024) Ireland’s Final 1990-2023 Inventory Data and the EPA’s latest 2023-2030 Projection Estimates.

Environmental Protection Agency (2020) Air Dispersion Modelling from Industrial Installations Guidance Note (AG4).

Environmental Protection Agency (2022) Air Quality in Ireland 2021 Annual Report on Air Quality in Ireland from the Environmental Protection Agency.

Environmental Protection Agency (2023) Air Quality in Ireland 2022 Annual Report on Air Quality in Ireland from the Environmental Protection Agency.

European Commission (2007) 2020 Climate & Energy Package.

European Commission (2011) A Roadmap for Moving to a Competitive Low Carbon Economy in 2050.

European Commission (2014) 2030 Climate & Energy Framework.

German VDI (2002) Technical Guidelines on Air Quality Control – TA Luft.

Government of Ireland (2015) Climate Action and Low Carbon Development Act

Government of Ireland (2019) Climate Action Plan 2019.

Government of Ireland (2022) Climate Action Plan 2023 CAP23.

Government of Ireland (2024) Climate Action Plan 2024 CAP24.

Institute of Air Quality Management (2014) Guidance on the Assessment of Dust from Demolition and Construction.

Institute of Air Quality Management (2016) Guidance on the Assessment of Mineral Dust Impacts for Planning.

Institute of Air Quality Management (2017) Land-Use Planning & Development Control: Planning for Air Quality.

Institute of Air Quality Management (2022) Guidance on the Assessment of Air Quality Impacts on Designated Nature Conservation Sites.

Institute of Air Quality Management (2024) Guidance on the Assessment of Dust from Demolition and Construction.

Intergovernmental Panel on Climate Change (2006) IPCC Guidelines for National Greenhouse Gas Inventories.

Intergovernmental Panel on Climate Change (2019) Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Institute of Environmental Management & Assessment (IEMA) (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance.

Met Eireann (2025) Monthly Meteorological Data for Cork Airport Weather Station.

Site-Specific Flood Risk Assessment, 2025 OSL Butler Consulting Engineers.

Transport Infrastructure Ireland (2011) Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes.

UK Department for Environment, Food and Rural Affairs (2008) Analysis of the relationship between annual mean nitrogen dioxide concentration and exceedances of the 1-hour mean AQS Objective.

UK Department for Environment, Food and Rural Affairs (2020) NOx to NO2 Conversion Spreadsheet (Version 8.1).

UK Highways Agency (2019) UK Design Manual for Roads and Bridges (DMRB), Volume 11, Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1 LA 105 Air Quality.

United Nations Framework Convention on Climate Change (2015) The Paris Agreement.

CHAPTER FOURTEEN

CULTURAL HERITAGE:
ARCHAEOLOGY & BUILT HERITAGE



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER FOURTEEN

Table of Contents

Cultural Heritage: Archaeology & Built Heritage

- 14.1 Introduction..... 14-1
- 14.2 Expertise & Qualifications 14-1
- 14.3 Proposed Development..... 14-1
- 14.4 Methodology 14-1
- 14.5 Difficulties Encountered 14-4
- 14.6 Baseline Environment..... 14-4
- 14.7 The ‘Do Nothing’ Scenario 14-11
- 14.8 Potential Significant Effects 14-11
- 14.9 Mitigation Measures 14-13
- 14.10 Residual Impact Assessment 14-13
- 14.11 Risk of Major Accidents or Disasters 14-13
- 14.12 Worst Case Scenario..... 14-13
- 14.13 Interactions 14-13
- 14.14 Monitoring 14-14
- 14.15 Conclusion 14-14
- 14.16 References and Sources 14-14

Table of Tables

Table 14-1: Registered archaeological sites (RMP/SMR) and registered architectural sites (PS and NIAH) within the Study Area 14-4

Table 14-2: Archaeological investigations undertaken within the Study Area 14-6

Table of Figures

Figure 14-1: Proposed development site outline in orange with registered archaeological sites (red) and registered architectural sites (blue) within a 1km Study Area www.archaeology.ie 14-5

Figure 14-2: Proposed development site outlined on OS six-inch map of 1842 www.archaeology.ie 14-8

Figure 14-3: Proposed development site outlined on OS 25-inch map 1897-1903 www.archaeology.ie 14-9

Figure 14-4: Proposed development site outlined on OS six-inch map 1934 www.archaeology.ie..... 14-9

Figure 14-5: Excerpt of Interpretation areas showing location of geophysical anomalies A, B and C in M3 and K in M11 (after Nicholls, 2024) 14-10

Figure 14-6: Proposed development site on aerial photograph with individual fields numbered www.googlemaps.ie 14-11

CHAPTER FOURTEEN | Cultural Heritage: Archaeology & Built Heritage

14.1 Introduction

This chapter of the EIAR was prepared to identify and assess the potential significant effects of the proposed development on the Cultural Heritage environment.

The phrase ‘*Cultural Heritage*’ is a generic term covering a multitude of cultural, archaeological and architectural sites and monuments within the landscape. For the purpose of this report, Cultural Heritage is divided into three sub-groups, namely Archaeology, Cultural Heritage and Architecture.

Archaeological Heritage

Archaeological heritage can be described as the study of past human societies through their material remains and artefactual assemblages. The Valetta Treaty (or the European Convention on the Protection of the Archaeological Heritage, 1992) defines archaeological heritage as “all remains and objects and any other traces of humankind from past times” this includes “structures, constructions, groups of buildings, developed sites, moveable objects, monuments of other kinds as well as their context, whether situated on land or under water”.

There are no known registered archaeological sites within the proposed development area. Within the broader landscape (1km Study Area) there are twenty four recorded archaeological sites, the closest of which is a fulacht fia (CO098-085), 300m to the southwest (Fig. 14-1). These registered archaeological sites provide evidence for human use and occupation of the area surrounding the proposed development site dating to the Bronze Age.

Cultural Heritage

Cultural Heritage is an expression of the ways of living developed by a community and passed on from generation to generation, including customs, practices, places, objects, artistic expressions and values. Environmental Protection Agency (EPA) Guidelines (2003), define cultural heritage as including archaeological heritage, architecture, history, landscape and garden design, folklore and tradition, geological features, language and dialect, religion, settlements, inland waterways (rivers), and place names. The more recent EPA Guidelines (2022) includes archaeology, architectural heritage and folklore and history under the broad category of cultural heritage.

In this assessment cultural heritage encompasses the history of the town of Carrigaline and is also reflected in the placenames and history of the proposed development site and study area.

Architectural Heritage

Architectural heritage is defined in the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act, 1999 as structures and buildings together with their settings and attendant grounds, fixtures and fittings, groups of such structures and buildings, and sites, which are of architectural, historic, archaeological, artistic, cultural, scientific, social or technical interest.

There are no registered architectural structures within the proposed development site. The closest registered structure is Kilmoney House (PS 635; NIAH 20990819), located 680m to the northeast (Fig. 14-1). There are three other registered structures within the Study Area; Kilmoney Abbey country house (PS 634; NIAH 20909817) and Kilmoney Bridge (NIAH 20909818), situated 950m and 1km to the northeast, respectively.

This chapter should be read in conjunction with the Geophysical Survey Report (Nicholls, 2024), a copy of which is given in **Appendix 14.2; Volume 3**.

14.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Musetta O’Leary of Lane Purcell Archaeology. Musetta holds an MA in Archaeology from University College Cork. Musetta has carried out the Cultural Heritage Section of a large number of diverse EIAR/EIS projects; residential, road construction, industrial, energy delivery, sporting and quarrying. Musetta has presented expert witness evidence at An Bord Pleanála Oral Hearings and has been involved in the preparation of EIAR’s for the following projects:

- LRD Castletreasure, Douglas (2023)
- IDL Midleton Expansion Masterplan (2023)
- Dripsey Quarry, Tullig More (2021)

14.3 Proposed Development

The full description of the proposed development is outlined in Chapter 2 ‘Development Description’ of this EIAR. In summary, the applicant seeks permission for the following Large Scale Residential Development (LRD) comprising the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

Aspects Relevant to this Assessment

There are no registered archaeological monuments or registered architectural structures within the proposed development site. However, much of our archaeological heritage survives only as subsurface remains, often forgotten and concealed from view. The proposed development will require largescale topsoil stripping and ground reduction which would have a direct impact on any hitherto unknown surviving subsurface archaeological remains. No responses of definite archaeological origin and no responses of significant potential were detected in the geophysical survey (Nicholls, 2024). It is important to note, however, that the absence of detected remains in a geophysical survey does not necessarily mean that no archaeological sites are present. Whilst geophysical survey may identify large subsurface sites, some smaller archaeological features might be outside the range of the instruments used to be detected by the survey. Consequently, where largescale ground disturbance takes place there is always the possibility of impacting undetected subsurface archaeological remains.

14.4 Methodology

The methodology used to complete this chapter comprised the following;

- A review of the relevant Legislation and Guidelines;
- A desktop assessment of the proposed development site and Study Area. This chapter includes cartographic depictions that highlight key features and characteristics of the proposed development site while additional cartographic representation of the development site and Study Area are given in **Appendix 14.1; Volume 3**;
- A geophysical survey was carried out on the proposed development site by Target Archaeological Geophysics in July 2024. A summary of the results of that survey is given in Section 14.6.5 while the full report is provided in **Appendix 14.2; Volume 3**;
- A walkover survey of the proposed development in August 2024. The results of this survey are given in Section 14.6.6. Photographs of the walkover are provided in **Appendix 14.3; Volume 3**;

- An evaluation of the likely impacts of the proposed development on the archaeological, architectural and cultural heritage - in Section 14.8. Impacts are assessed in accordance with Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2022);
- Proposed mitigation measures to be undertaken to prevent or reduce any potential impacts on the archaeological, architectural and cultural heritage environment - Section 14.9, while Residual Impacts are provided in Section 14.10;
- References and Sources - Section 14.16.

Relevant Legislation & Guidance

In Ireland, the primary means of protecting Cultural Heritage are the National Monument (Amendments) Acts 1930 to 2014, The Heritage Act 1995, the relevant provisions of the National Cultural Institutions Act 1997, The Architectural Heritage (National Inventory) and Historic Monument (Misc. Provisions) Act 1999 and the Local Government (Planning and Development) Act 2000. The government's policies for both the archaeological and architectural heritage are relayed in a series of specific published guidelines.

A new Heritage Bill, sponsored by the Minister for Housing, Local Government and Heritage was enacted by both Seanad Éireann and Dáil Éireann on October 13th 2023. The Act encompasses laws and provisions aimed at preserving, protecting and managing sites of historical, cultural and archaeological significance. **The Historical and Archaeological Heritage and Miscellaneous Provisions Act 2023** will replace the National Monuments Acts 1930 to 2014 and other related legislation with provision for the protection of heritage. It will introduce new measures to protect archaeological structures and sites including; the establishment of a single Register of Monuments, a statutory reporting scheme for newly discovered monuments and provisions to prevent the illicit import and possession of stolen cultural property. The Act is all encompassing covering licensing, a reporting system, and a single Register of Monuments and will substantially strengthen the protection of archaeological and built heritage. In the meantime, the existing legislation will remain in place while the new act is implemented through a series of commencements over the coming years.

This chapter is prepared having regard to the following guidelines:

- *Guidelines on the information to be contained in Environmental Impact Assessment Reports*, 2022 (Environmental Protection Agency);
- *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*, 2003 (Environmental Protection Agency);
- *Framework & Principles for the Protection of the Archaeological Heritage*, 1999 (Department of Arts, Heritage, Gaeltacht & the Islands).
- *Policy & Guidelines on Archaeological Excavation*, 1999 (Department of Arts, Heritage, Gaeltacht & the Islands).
- *Architectural Heritage Protection, Guidelines for Planning Authorities*, 2004 (Department of the Environment, Heritage and Local Government).

Cork County Development Plan 2022-2028 (CCDP) - Local Policies with regards to Heritage

The CCDP outlines Cork County Council's objectives/policies regarding the preservation of the archaeological, architectural and cultural heritage of the county. The Plan 'recognises the importance of identifying, valuing and safeguarding our archaeological, architectural and cultural heritage for future generations through appropriate protection, management and enhancement measures or via the sensitive development of this resource' (CCDP, Vol. 1, Chapter 16, 353). The protection of archaeological, architectural and cultural heritage is relayed through twenty six Plan Objectives (HE 16-1 to HE 16-26) covering all heritage aspects.

Objectives relating to heritage which are of relevance to this development include the following;

Objective 16-13:

Previously unidentified archaeological sites that are uncovered during construction works must be investigated and recorded. 'The Council will require preservation in situ to protect archaeological monuments discovered. Preservation by record will only be considered in exceptional circumstances'.

Objective 16-23: The CCDP seeks to;

'Protect and promote the cultural heritage of County Cork as an important economic asset and for its intrinsic value to identity of place and the wellbeing of people within the County'.

Objective 16-24: The CCDP seeks to;

'promote and preserve local place names, local heritage and the Irish language by ensuring the use of local place names or geographical or cultural names which reflect the history and landscape of their setting in the naming of new residential and other developments. Such an approach will be a requirement of planning permissions for new developments'.

Desktop Study

The desktop study aims to provide a thorough understanding of the archaeological, architectural and cultural heritage environment of the proposed development site and Study Area by utilising the following sources;

Record of Monuments and Places (RMP)

This record was established under Section 12 (1) of the National Monuments (Amendment) Act 1994. It lists all monuments and places believed to be of archaeological importance in the County. The numbering system consists of two parts: the first part is the county code (CO for Cork) followed by the Ordnance Survey map number (six inches to the mile scale); the second part is the number of a circle surrounding the site on the RMP map, e.g. (CO098-085) refers to circle 085 on OS sheet 098 for County Cork. The area within the circle is referred to as the *Zone of Archaeological Potential (ZAP)* or zone of notification for that site. Its diameter can vary depending on the size and shape of the site but it averages out at approximately 180m. The RMP for County Cork was published in 1998. All RMP sites within 1km of the proposed development site are listed in **Table 14-1**.

Sites and Monuments Record (SMR) Database of the Archaeological Survey of Ireland (ASI)

The purpose of the ASI is to compile a base-line inventory - the SMR of the known archaeological monuments in the State. It contains details of all monuments and places or sites known to the ASI which pre-date AD 1700, and a selection of monuments which post-date 1700. The large record archive and databases resulting from the survey are continually updated. Archaeological sites which are added to the database are proposed to be included in the next published edition of the RMP and will then be afforded its protection. This database, complete with maps, is available for consultation via the National monuments Service (NMS) website at www.archaeology.ie. All SMR sites within 1km of the proposed development site are listed in **Table 14-1**.

Archaeological Inventory

The inventories for each county are follow-ons by the ASI to the RMPs. They give a written description of each archaeological site in the county. The archaeological inventory for East and South Cork, Volume 2 (Power, Byrne, Egan, Lane & Sleeman, 1994) was published in 1994 and a follow up volume, Volume 5 (Ronan, Egan & Byrne, 2009), was published in 2009.

Files of National Monuments Service

These files were consulted to retrieve information on lists of RMP sites that have been afforded added protection such as;

- National Monuments in ownership or guardianship of the state – none in the Study Area
- National Monuments in ownership or guardianship of the local authority – none in the Study Area
- Monuments subject to Preservation Orders and Temporary Preservation Orders – none in the Study Area
- Monuments listed in the Register of Historic Monuments – one in the Study Area; Ringfort (CO098-078) ID number 592, situated 1km to the north.

Database of Irish Excavation Reports www.excavations.ie

This website provides a database of summary accounts of archaeological excavations and investigations in Ireland undertaken between 1970 and 2024. The database was queried for any investigations undertaken in any of the townlands within proximity of the proposed development site and these are listed in **Table 14-2**.

National Inventory of Architectural Heritage (NIAH)

The NIAH was set up under the Convention for the Protection of the Architectural Heritage of Europe or the Granada Convention of 1985. It was established on a statutory basis under Section 2 of the Architectural Heritage (National Inventory) and Historic Monuments (Miscellaneous Provisions) Act 1999. The work of the NIAH involves identifying and recording the architectural heritage of Ireland, from 1700 to the present day, in a systematic and consistent manner. It is divided into two parts; The Building Survey and Historic Garden Survey (www.buildingsofireland.ie). The main function of both is to identify and evaluate the State's architectural heritage in a uniform and consistent manner, so as to aid its protection and conservation. The NIAH carried out a survey of the buildings of County Cork between 2006 and 2011. Under Section 53 of the Planning and Development Act 2000, all structures considered of regional, national or international Importance in the survey are recommended for inclusion in the Record of Protected Structures (RPS) by the Minister for Arts Heritage and the Gaeltacht. If this is not adopted by the local authority, the reasons must be communicated to the Department. The Building and Historic Garden Survey for County Cork is available online. The NIAH for County Cork includes approximately 6,500 items of architectural importance in the County. The three structures within 1km of the proposed development site are listed in **Table 14-1**.

Aerial Photographs

The Ordnance Survey of Ireland (OSI) and Google maps have posted a number of online aerial photographs dating from 1995 (OSI; 1995, 1996-2000, 2001-2005, 2006-2012, 2011-2013 and 2013-2018). These were examined to identify any previously unrecorded features of archaeological/cultural heritage significance that may only be visible from the air. No potential archaeological features were noted in the photographs.

LiDAR

LiDAR (Light Detection and Ranging) is a survey method that can provide detailed landscape data and information on the earth's topography which enable a better understanding of historical landscapes and their past uses. There is no LiDAR data available for the proposed development site and surrounding area.

Cartographic Sources

The following maps were consulted; The three editions of the OS map six-inches to one mile; the first edition of 1841-42, the second edition of 1897-1903 and the third edition of 1934 (see **Figs. 14-2 – 14-4**); The 25-inches to one mile OS map from which the second edition six-inch map was derived.

A larger section of the OS first edition map showing nearby country houses and demesne landscapes and the Down Survey (1656-57) are given in **Appendix 14.1; Volume 3**.

Site Surveys/Investigations

Geophysical Survey

A geophysical survey was carried out across the proposed development site on the 2nd of August 2024 (Nicholls, 2024). The survey, comprising a high-resolution recorded magnetometry, was conducted in 11 fields numbered M1-M11 out of a total of 14 fields which make up the proposed development site. Three fields were not surveyed due to environmental conditions; one was heavily wooded and two had poor access and ground conditions (wet and difficult surface) which were unsuitable for survey. The results of the survey are discussed in Section 14.6.5 below while the full geophysical report is included in **Appendix 14.2; Volume 3**.

Walkover Survey

The primary purpose of a walkover survey is to assess the physical environment in which the proposed development will take place to identify any potential archaeological sites or Areas of Archaeological Potential (AAP) and any features of cultural heritage interest. The proposed development site was inspected on the 7th of August 2024. The results of the walkover survey are discussed in Section 14.6.6 with plates given in **Appendix 14.3; Volume 3**.

Consultation

Following a pre-application consultation with Cork County Council Archaeologist, Annette Quinn, pre-development investigations were requested to inform the development layout and design. A geophysical survey was conducted on the 2nd of August 2024 and its findings were subsequently reviewed with Ms. Quinn. Based on the survey results the following requirements were proposed;

- Licensed archaeological testing of the proposed development to assess the anomalies identified in the geophysical survey and to conduct broader testing across the site. Testing is scheduled to take place in early 2025. The scope and layout of the testing has been agreed upon with the county archaeologist, and the results will be submitted to Cork County Council. If archaeology is identified during the testing program, the County Archaeologist will be contacted immediately. The results of testing will be submitted to the County Archaeologist to determine appropriate mitigation measures. Should significant archaeological remains be detected, further mitigation measures may be required, such as preservation *in situ*, archaeological monitoring, redesign, buffer zones or other mitigation measures as appropriate.

14.5 Difficulties Encountered

Much of our archaeological heritage survives only as subsurface remains, often forgotten and concealed from view. One area in the middle, southern section of the proposed development site is densely wooded. It is heavily overgrown with trees and briars which obscure the ground surface and alter the landscape making the detection (either by visual inspection or geophysical survey) of any potential archaeological sites extremely difficult. This area was therefore, not inspected or surveyed. Other than this wooded area, the remaining thirteen fields were fully accessible and were walked. The woodland area will be incorporated as part of an active open space for future residents, featuring amenities such as wooded play areas, exercise stations and seating areas.

14.6 Baseline Environment

Archaeology

There are no registered archaeological monuments within the proposed development site. The closest registered site is a fulacht fia (CO098-085), 300m to the southwest and a ringfort (CO098-017001) and souterrain (CO098-017002), 370m to the northeast. In total, there are twenty four registered archaeological sites within 1km of the proposed development site (the Study Area), providing evidence for human settlement and activity dating to the Bronze Age (Table 14-1; Fig.14-1). One of these registered sites is a redundant record. Sites classified as such, following investigation, are now deemed to have no archaeological potential.

Table 14-1: Registered archaeological sites (RMP/SMR) and registered architectural sites (PS and NIAH) within the Study Area

RMP/SMR PS, NIAH	Site Type	Townland	Distance from development site
CO098-008	Standing stone (H 1.39m; 0.72m x 0.6m)	Coolsallagh	1.5km to SW
CO098-009	Standing stone (stone removed)	Kilmoney	830m to SW
CO098-010	Standing stone (stone removed)	Kilmoney	1.3km to SW
CO098-011	Standing stone (stone removed)	Kilmoney	1.3km to SW
CO098-012	Standing stone (H 0.93m; 1.3m x 0.48m)	Kilmoney	900m to S
CO098-013	Enclosure (42.8m N-S; 58.2m E-W) defined by an earthen bank (1.1m high) and external fosse (D. 0.4m)	Kilmoney	580m to NW
CO098-014	Ringfort (Rath) A levelled circular area (29.2m N-S; 30.5m E-W) now defined by a low grass-covered bank	Kilmoney	1km to NW
CO098-015	Ringfort (Rath) A slightly raised, circular area (40m E-W; 37.8m N-S) enclosed by scarp (H 0.9m) and is now planted with deciduous trees within the Kilmoney Abbey estate	Kilmoney	680m to NE

CO098-016 PS634 NIAH 20909817	Country House Kilmoney Abbey	Kilmoney	960m to NE
CO098-017001	Ringfort (Rath) Circular area (30.8m N-S; 30.1m E-W) enclosed by earthen bank (int. H 0.7m; ext. H 1.7m.	Kilmoney	370m to NE
CO098-017002	Souterrain	Kilmoney	370m to NE
CO098-018	Ringfort (Rath) No visible surface expression lies within Wrenville housing development	Kilmoney	530m to NE
CO098-019	Ringfort (Rath) A heavily overgrown circular area (diam. c. 30m) defined by an earthen bank (int. H. 1.55m) with an external fosse visible SE to N and a second bank (H 0.85) SE-N (ibid.)	Kilmoney	1.1km to NE
CO098-020	Religious House Augustinian canons	Kilmoney	1km to NE
CO098-046	Enclosure	Boardee	1.4km to S
CO098-060	Vernacular House	Coolsallagh	1.4km to SW
CO098-074	Standing stone (stone removed)	Boardee	1.3km to S
CO098-076	Standing stone (stone removed)	Boardee	1.4km to S
CO098-078 ID592	Ringfort (Rath) Comprises an arc (c. 33m) defined by an earthen bank with external fosse (D 1.3m)	Kilmoney	1km to NE
CO098-079	Redundant Record	Knocknalurgan	880m to SE
CO098-085	Fulacht fia	Kilmoney	300m to SW
CO099-099	Standing stone	Boardee	1.5km to SE
CO099-109	Standing stone	Boardee	1.5km to SE
CO099-104	Ringfort (Rath) No visible surface expression	Commeen	1.3km to SE
PS 635 NIAH 20909819	Kilmoney House	Kilmoney	660m to NE
NIAH 20909818	Kilmoney Bridge	Kilmoney	1km to NE



Figure 14-1: Proposed development site outline in orange with registered archaeological sites (red) and registered architectural sites (blue) within a 1km Study Area www.archaeology.ie

The following account of the archaeological and cultural heritage of the Study Area is chronological. The archaeological timescale can be divided into three major periods, each with a number of sub-sections:

The prehistoric period: Mesolithic - (circa 8000 to 4000 BC); Neolithic - (circa 4000 to 2400 BC); Chalcolithic c. 2450-2200; Bronze Age (circa 2200 to 700 BC) – Iron Age (circa 700 BC to AD 400). **The medieval period:** Early medieval 5th – 12th century; high medieval 12th century – circa 1400; late medieval circa 1400 – 16th century. **Post medieval period:** 17th century onwards

Mesolithic, Neolithic and Chalcolithic

The earliest evidence for human colonisation and settlement in Cork can be dated to 8000 BC, the Mesolithic Period. The people of this era were hunter-gatherers, entirely dependent on what food could be obtained through hunting and gathering, amongst other things, edible plants and shellfish. The transition of these early settlers from hunter/gatherers

to a farming way of life in the Neolithic Period brought about more permanent settlements and a more complex and structured social hierarchy. The Neolithic period is noted for the construction of megalithic tombs, indicating a growing social complexity and the importance of communal activities. The Chalcolithic, meaning the ‘Copper and Stone Age’ is a transitional phase in Ireland between the Neolithic and Bronze Age that is characterised by the gradual adoption of copper metallurgy as an established technology prior to the more advanced use of bronze in the subsequent era. This period is also frequently represented on excavated sites ‘by the widespread cultural adoption of a new form of pottery, collectively referred to as Beaker Ware’ (Hanley, 2013). There are no known archaeological sites dating to the Mesolithic, Neolithic or Chalcolithic periods in the Study Area.

Bronze Age and Iron Age

The Irish Bronze Age is characterised by the widespread adoption of bronze, the emergence of distinctive pottery styles, changes in burial traditions and an increase in population. The burial traditions of the Bronze Age were generally much simpler than the elaborate megalithic tombs of the earlier Neolithic period, although these were frequently reused for later burials. Most Bronze Age burials, either cremated or inhumed, were placed in stone-lined cists or simple earth-cut pits often accompanied by grave goods. Some graves were marked with a cairn or a mound of stones, while others were marked by a mound of earth known as a barrow.

Information on all the recorded archaeological sites within the Study Area is taken from the ASI database which derives its data from the Archaeological Inventories of County Cork; Volume 2: East and South Cork (Power *et al.* 1994) and Volume 5 (Ronan *et al.* 2009) with some entries updated as a result of more recent research. The closest registered archaeological site to the proposed development is a fulacht fia (CO098-085) in the townland of Kilmoney, 300m to the southwest. Fulachtaí fia are the most common prehistoric site type in the country and are generally interpreted as ancient cooking sites but could have been used for any purpose that required large quantities of hot or boiling water such as bathing, processing textiles, tanning, brewing, extraction of fats from meat, and soap making, or even a combination of these functions (Ó Drisceoil, 1988; Monk, 2007; Quinn & Moore, 2007). They are generally dated to the Bronze Age (2400-500BC), particularly the Late Bronze Age, although a minority of excavated examples have been dated to the Neolithic. One fulacht fia excavated as part of the Carrigaline Western Relief Road, approximately 1.5km to the northeast of the proposed development site, was multi-phased with dates ranging from the Bronze Age to the Iron Age (see 2014:457, Table 14-2).

Fulachta fia are recognisable as horseshoe-shaped mounds of heat-shattered stones with a depression towards the centre, often located near a stream or in waterlogged areas. The central depression was generally the location of a trough or pit cut into the ground. The trough, which was sometimes lined with timber, wattle or stone, would have been excavated below the water table, near a spring or stream and allowed to fill with water. A fire was set adjacent to the trough, to heat stones, and the water was then heated or boiled by immersing the fire-heated stones in it. Experiments have shown that large quantities of water can be boiled in this way in about twenty minutes and joints of meat wrapped in straw can be cooked over several hours. After each cooking session, the stones were removed from the trough and thrown to the side, finally forming the characteristic horseshoe-shaped mound of stones. Fulachtaí fia generally enjoy a good survival rate owing to their siting in areas of low-lying, poorly drained land where tillage is generally not practiced. Many, however, have been impacted by drainage and land improvement works in recent decades and those that have been regularly ploughed are generally reduced to a spread of burnt heat-shattered stones visible as a blackened area in a ploughed field. The example in Kilmoney is described in the ASI Database as follows; ‘A roughly semicircular spread (46.7m N-S; 15.2m E-W) of heat-shattered stones and charcoal-enriched soil with an opening facing to the W, towards a nearby stream’.

The most common monument type in the Study Area with nine examples, are standing stones; four in Kilmoney (CO098-009, CO098-010, CO098-011 and CO098-012), four in Boardree (CO098-074, CO098-076, CO098-099 and CO098-109) and one in Coolsallagh (CO098-008). These monuments are generally thought to date to the Bronze Age, but were also erected in the Iron Age and some can even date to more recent centuries. The stones may have had a number of functions in the prehistoric landscape. They were often erected in prominent locations and may have marked routeways or tribal boundaries but others may

have marked burials or had a ceremonial or ritual purpose. More recent examples may have been erected as scratching posts for animals. Standing stones erected during the prehistoric period often exhibit a NE-SW orientation. This alignment is not random and likely reflects the cultural, astronomical, and ritual significance these structures held for the people who constructed them. Stones aligned in this direction may correspond with the rising or setting sun during significant times of the year, such as the solstices or equinoxes. The NE-SW orientation could be aligned on the rising sun during the summer solstice (NE) and the setting sun on the winter solstice (SW), marking important agricultural or ceremonial periods.

Of the nine standing stones in the Study area, seven are no longer extant. In the townland of Kilmoney, three of the stones (CO098-009, CO098-010 and CO098-011), once sited in a prominent position, overlooking the Owenboy river valley and estuary, were removed by the landowner in 1965 (ASI Database). The fourth standing stone in Kilmoney (CO098-012), situated c. 650m to the northwest of CO098-011 comprises a low rectangular stone (H 0.93m; 1.3m x 0.48m) with packing stones exposed at base, with its long axis N-S (*ibid.*). The four standing stones in the townland of Boardree were removed during reclamation works (*ibid.*). The standing stone (CO098-008) in the townland of Coolsallagh, situated in bogland, is almost square in section (H 1.39m; 0.72m x 0.6m), of irregular shape with probable long axis E-W (*ibid.*).

Early Medieval Period

There are a total of seven ringforts in the Study Area, six of which are in the townland of Kilmoney, with one in the townland of Commeen. The Early Christian or early medieval period (5th to the 12th century AD) in Ireland is characterised by the introduction of Christianity from the late 4th century onwards, becoming widely established during the second half of the sixth century. Ringforts (also known by the names rath, lios, cathair or caiseal/cashel) functioned as defended farmsteads and are the most characteristic monument of this period. They are generally circular or oval in plan defined by an earthen bank with an external ditch or fosse. The sub-surface remains of circular dwelling houses and associated outbuildings are frequently revealed within ringforts during excavation. More occasionally evidence of specialised craft-working is also found during excavation indicating the possibility of higher status sites. The main phase of construction and occupation of these sites dates from the beginning of the 7th century AD to the end of the 9th century AD. Many of these sites appear to have been levelled in modern times by agricultural activity, although archaeological features may still remain undisturbed below ground level.

There is no visible surface trace of the ringfort in Commeen (CO099-104) and one of the ringforts in Kilmoney (CO098-018), the site of which is now part of a green area within the housing development, Wrenville. Of the other five ringforts in Kilmoney, one (CO098-017001) has an associated souterrain (CO098-017002). The term ‘souterrain’ comes from the French ‘sous’ meaning under and ‘terre’ meaning earth (Power *et al.* 1994, 153). Souterrains generally contain one or more chambers linked by narrow creepways. Their function may have been for storage or as defensive features used as hideaways in times of strife. They can be found as isolated sites but many souterrains are associated with and situated within ringforts. There is a tradition of a souterrain in Kilmoney but there is no visible surface trace of it (Power *et al.* 1994). This ringfort comprises a circular area (30.8m N-S; 30.1m E-W) which is enclosed by an earthen bank (int. H. 0.7m; ext. 1.7m). The ringfort lies in agricultural land and is bordered by the residential developments of Wrenville to the east and Kilmoney Woods to the west. The other four ringforts in Kilmoney are described in the ASI Database as follows; CO098-019 is a heavily overgrown circular area (diam. c. 30m) defined by an earthen bank (int. H. 1.55m) with an external fosse visible SE to N and a second bank (H 0.85) SE-N (*ibid.*); CO098-014 comprises a levelled circular area (29.2m N-S; 30.5m E-W) now defined by a low grass-covered bank; CO098-015 comprises a slightly raised, circular area (40m E-W; 37.8m N-S) enclosed by scarp (H 0.9m) and is now planted with deciduous trees. This ringfort appears to have been modified and used as a tree ring in the past on estate lands associated with Kilmoney Abbey (CO098-016; PS 634); CO098-078 comprises an arc (c. 33m) defined by an earthen bank with external fosse (D 1.3m). The site was described by O’Leary (1919, 35) as ‘a lios’ c. ‘1/4-acre in area’, bisected by a road.

The enclosure in Kilmoney consists of a large oval area (42.8m N-S; 58.2m E-W) defined by an earthen bank (1.1m high) and external fosse (D. 0.4m) (Power *et al.*, 1994). The term enclosure is applied to archaeological sites, which cannot be definitively classified. Very often these enclosures are ringforts or cashels, which fall beyond the accepted size range for these monuments (i.e. less than 20m or more than 60m in diameter). Sometimes they can be of indeterminate shape and can date to as early as the Bronze Age or as recently as the last century when they were used as animal shelters. The enclosure in Kilmoney stands within the demesne lands associated with Kilmoney Abbey (CO098-016), a country house listed as a Protected Structure (PS 634) in the Cork County Development Plan (2022-2028) (see **section 14.6.3 below**).

The remains of a small cell of an Augustinian house is situated 1km to the northeast of the proposed development site, in the grounds of Kilmoney Abbey House (CO098-016). The remains comprise the ivy clad western gable of a church, the point of which has fallen. The surviving wall (L 6.5m; Wth 1m) is broken off at the northern end, while a short return section (L 0.35m) of the southern wall remains intact. According to Gwynn and Hadcock (1988, 183) this represents the site of ‘a small cell’ associated with the religious house, Gill Abbey (CO074-036) in Cork City which was ‘probably merely a vicarage after the mid-fourteenth century’ (*ibid.*). The foundation date of the site is not known, though the house at Gill Abbey was likely founded in the 13th century, following the spread of the Augustinian order throughout Ireland (ASI Database).

No archaeological investigations have been undertaken within the proposed development site. Those undertaken within the Study Area and greater region are listed and summarised in **Table 14-2** below (www.excavations.ie).

Table 14-2: Archaeological investigations undertaken within the Study Area

Excavation Ref.	Townland/Location	Details
2002:0318	Kilmoney	Archaeological monitoring of a housing development within the zone of archaeological potential of a ringfort and a possible souterrain (CO098-017001, -017002), 370m to the northeast of the proposed development site revealed no finds or features of archaeological significance (Lane, 2002).
2003:0187	Carrigaline	The laying of an ESB cable across the Owenboy River was monitored and spoil from the cable trench metal detected under licence. No archaeological finds or features were recovered (Carroll, 2003).
2014:214	Carrigaline West	Testing of the site of the former Carrigaline Pottery Works was undertaken as part of the proposed western bypass of Carrigaline. A total of 8 trenches were excavated and the remains of a former millrace were noted in Trench 3. The millrace (c. 1m wide) was 1.5m below ground and was recorded for 14m. A drystone (limestone) lining was noted on the southern side and it was backfilled with clayey silt (O’Hara, 2014).
2014:456	Carrigaline West	Three small sites were excavated as part of advanced archaeological works for the Carrigaline Western Relief Road. Carrigaline West 1 was a badly preserved dumb-bell shaped cereal-drying kiln which was truncated by later drains and furrows. A tree bole and isolated stone drain were also recorded. Seeds from the drying chamber in the kiln returned a date of AD988-1147 while a sample of charcoal displaced from the kiln was dated to AD 901-1025. Carrigaline West 2 consisted of a potential hearth or possibly root burning or scrub clearance and early modern furrows and drains. Carrigaline West 3 comprised some shallow spreads and pits which contained burnt stone. Charcoal from one of the pits was dated to the late Bronze Age (1108-925 BC) (O’Hara, 2014).

2014:457	Kilmoney	Three small sites were excavated as part of advanced archaeological works for the Carrigaline Western Relief Road. Kilmoney 1 consisted of a cluster of three pits excavated in the floodplain of the Owenboy River. Each pit contained charcoal and heat-fractured stone. A sample of alder charcoal from the pit was dated to between 2456-2205BC, the Chalcolithic Period. 100m to the south of this was Kilmoney 2, a disturbed fulacht fia, with 13 pits of varying sizes. Two of the pits were dated to the Early Bronze Age and a third dated to the Middle Bronze Age. A sample of alder charcoal from the disturbed burnt mound was dated to 771-519 BC, the Early Iron Age indicating at least three phases of fulacht fia activity at this site. Oak charcoal from the site was dated to 372-45BC, the Middle Iron Age (O’Hara, 2014).

Cultural heritage of the Study Area

The proposed development site is located in the townland of Kilmoney, in the parish of Kilmoney and the barony of Kerrycurrihy. The barony of Kerrycurrihy is described in the terriers (detailed description of the land) associated with the Down Survey (1656-1658) thus: *‘The most considerable place in this Barony is at Carrigoline it being the seate of Francis Boile, sonne to the Earle of Corke’* ([Http://downsurvey.tcd.ie](http://downsurvey.tcd.ie)). The county is the principal administrative unit in Ireland with Cork being the largest while the smallest administrative division is the townland. The Irish landscape is divided into over 62,000 townlands, a system of landholding that is unique in Western Europe for its scale and antiquity (O’Connor 2001). The townland boundaries recorded by the Ordnance Survey may well be aligned on older land divisions dating to early historic times and may physically overlie archaeological evidence for such early forms of land division. Many townlands are pre-Anglo/Norman in origin and Irish historical documents consistently use townland names throughout the historic period to describe areas and locate events accurately in their geographical context. The townland names and boundaries were standardised in the nineteenth century when the Ordnance Survey began to produce large-scale maps of the country. Though townlands predate parish and county divisions, their original Irish names were systematically recorded and anglicized during the creation of the OS six-inch maps, thus facilitating their preservation.

A townland name in its original Irish form often referred to an easily identifiable feature of the landscape such as the word **Cloon** (in Irish ‘Cluain’ meaning meadow), **Carrig** (meaning rocky) and **Knock** (in Irish ‘Cnoc’ meaning hill). Examples of such townlands within the Study Area and larger region are; Cloonlough in Irish *Cluain Locha*, meaning Meadow of the lakes; Carriganleigh in Irish *Na Carragáin liatha*, meaning grey rocky place and Knocknalurgan, in Irish ‘Cnoc na Lorgan’ meaning hill of the shins. Other townlands in the Study Area are simply descriptive of the landscape or their situation such as; Coolsallagh, in Irish ‘*Cúil Saileach*’ meaning dirty corner or angle; Commeen in Irish ‘Coimín’ meaning common land or little hollow/glen and Boarder, in Irish ‘*Borda*’ meaning border (www.loganim.ie). Townlands beginning with **Bally** or **Baile** (both meaning settlement) are very common in Ireland and are often attached to a person’s name. Ballinling in Irish ‘*Baile an Laighnigh*’ meaning Lining’s town and Ballinvarosig, in Irish, ‘*Baile an Mhalrósaigh*’ meaning Broase’s town.

The townland name ‘Kilmoney’ derived from the Irish ‘Cill Mhóna’ meaning ‘Church of the Bog’ first appears in historical records in 1301. It is mentioned in the *Calendar of Plea Rolls* (legal records preserved in the National Archives of Ireland) under the spelling ‘Kylmony’. The modern spelling, ‘Kilmoney’ is first documented in 1591 in the *Calendar of Fiants* from the reign of Henry VIII (www.loganim.ie). The evolution of the spelling over time reflects the anglicization process typical of the period where Irish place names were adapted into English spellings.

The proposed development site is located 2km southwest of Carrigaline, within the settlement boundary of the town. The earliest recorded settlement in the Carrigaline area was in the 6th century when a church (CO099-002) was founded in Kilnaglery townland, located to the east of the present town, and this remained in use until the 11th century (O’ Mahony

1993). Carrigaline Castle (CO087-037) was built by Milo de Cogan in the 12th century and this was located 1.5km to the east of the present town. A medieval settlement, known as *Beau Voir/Beavor* (pleasant view), developed around the castle and this was included in a list of markets compiled by the sheriff of Cork in 1299 (O’ Brien 1993). The castle came into the ownership of the Earls of Desmond in the 15th century. By the 17th century the area was under the ownership of Richard Boyle, the Earl of Cork, who intended to develop a new port at Beavor to challenge the dominance of Cork City but this never materialised (O’ Flanagan 1993). By the 18th century the castle had become a ruin and the adjacent settlement had gone into decline. The settlement at the present-day location of Carrigaline began to develop in the 18th century when a bridge was built across the Owenboy River at its narrowest point. The 18th century bridge was built c.25m to the west of the present bridge and was close to what is now the rear of Walshes Pharmacy (O’ Mahony 1993). The 18th century settlement was situated immediately to the south of the bridge and there was also some settlement in the area around Carrigaline Crossroads to the north of the village.

The first decade of the 19th century saw an expansion of Carrigaline following the development of a milling industry in the village by William & Michael Roberts. The Lower mill (CO087-033;PS 00579), situated 35m to the east of Main Street and now converted to apartments, was erected c.1807. In 1834 the original bridge over the Owenboy River was replaced by the present bridge located c.25m to the east and in the 1840s the portion of Main St. to the north of this bridge was built. Like many traditional industries, the milling industry in Carrigaline experienced decline in the 20th century due to changes in agricultural practices, the rise of large industrial mills, and shifts in economic focus.

Lewis (1837) described Carrigaline village as follows: *‘The village has a very pleasing appearance; it consists of several good houses and a number of decent cottages, extending into the parish of Kilmoney, on the south side of the river, over which is a bridge of three arches. There are two large boulting-mills, the property of Messrs. Michael Roberts and Co., which grind 12,000 sacks of flour annually, of which the greater part is shipped for England from Cork. The trade consists chiefly in the export of corn, flour and potatoes, and the import of coal and culm. The channel of the river has lately been deepened six feet, and vessels can now deliver their cargoes at the bridge.... The river Awenbwuy, winding through a rich corn country is well situated for commerce, and several large mills are in the course of erection on its banks’* (Lewis 1837, 82).

Carrigaline Pottery (no longer extant) was located c. 70m to the west of Main Street between Carrigaline Court Hotel and Supervalu. The factory, founded in 1928 by Hodder W.B. Roberts, was a world-famous establishment and for much of middle of the 20th century was the main source of employment in Carrigaline. The factory which started out with six employees underwent major expansion in the mid-1930s with the construction of a new factory and by 1939 the factory employed 50 people. In 1952 it employed 160 and by 1960, 200 people were employed, before the factory finally closed in 2003 (O’ Mahony, 1993). The site of the factory is now partly occupied by waste ground, with warehousing to the north and car parking behind AIB to the south.

Architectural Heritage

There are no Protected Structures (PS) or structures listed in the NIAH within the proposed development site. The closest PS is Kilmoney Abbey (CO098-016; PS634), situated 960m to the northeast. The house is described in the NIAH (20909817) as a nine-bay two-storey U-plan house, constructed c. 1750. According to the NIAH, it is unusual for a building of this age to retain so much of its original fabric and character. Lewis in 1837 referred to Kilmoney as the ‘handsome residence’ of Michael Roberts.

Kilmoney House (PS645; NIAH 20909819) is situated 660m to the northeast of the proposed development site. The house is described in the NIAH as follows; *‘Attached five-bay two-storey house, built c. 1800, having two-bay single-storey addition to the side (west) and attached outbuildings to east’*. There is a two-bay, single-storey former house to the south with a pitched corrugated roof with render copings. This vernacular house lies within enclosing walls with square-profile gate piers and replacement wrought-iron gates. According to the NIAH, this vernacular house and an outbuilding add much to the setting and context of Kilmoney House. Kilmoney Bridge (NIAH 20909818), situated 1km to the northeast of the proposed development site, is a triple-arch road bridge built in c. 1800 over a tributary of the Owenboy River (NIAH). The bridge is described in the NIAH as *‘A handsome road bridge that exhibits fine craftsmanship in its construction. The finely dressed stone block voussoirs contrast*

against the rubble stone spandrels adding a pleasing textural variation. It is thought that the bridge was part of a private road that led around Kilmoney Abbey, known as Captain Robert's Bóthareen'.

Many of the more important country houses had demesnes and Kilmoney Abbey (CO096-016; PS 634) was no exception. The OS six-inch map of 1842 depicts the demesne associated with this house approximately 550m to the northeast, along with those of Maryville - c. 500m to the east and Stonehill House - c. 900m to the east (**Fig. 1; Appendix 14.1; Volume 3**). Kilmoney House (PS645; NIAH 20909819) does not have a demesne. Country houses and their demesne lands generally date to the 18th and 19th centuries. Although demesnes were widespread in medieval Ireland, the foundation of those still evident on the modern landscape date to the middle of the 18th century when 'natural style' landscape parks were adopted by Irish landowners. The typical demesne consisting of the big house with associated buildings, ornamental grounds, landscaped gardens and woodlands, often enclosed by high walls and belts of trees still remains the dominant man-made feature of the post medieval landscape in Ireland. At one time demesnes occupied nearly 6% of the country (Aalen, Whelan & Stout, 2000, 197). Much of the demesne landscapes that enclosed the big houses have been reduced in size from their heyday in the 18th/19th centuries. According to the landed estates database, at the time of Griffith's Valuation (undertaken between 1848 and 1864 to determine the liability of each household to pay the 'poor rate' to support the destitute in each Poor Law Union), Kilmoney House was valued at £50 and was being leased by Michael Roberts from Thomas R Sarsfield; Stonehill House was leased by Henry Busteed from William B. Warren when it was valued at £11 10s; and Maryville which was smaller and also owned by Warren was valued at £8 (<https://landedestates.ie>). Kilmoney House is still extant, while both Stonehill and Maryville have been demolished.

Cartographic Information

The OS 6-inch map of 1842 (**Fig. 14-2**) depicts the proposed development site as thirteen fields of varying sizes within a rural setting. On this OS map edition, the area of the proposed development site is bordered to the north and east by local roads and to the west by a road accessing a farm complex outside the area of the development site to the south. The site is bordered to the south by agricultural fields. There is one small structure at the northeastern boundary, close to the road. The demesne lands of Maryville lie c. 500m to the east, beyond which is the demesne of Stonehill House while the demesne of Kilmoney Abbey country house (CO098-016) lies c.550m to the northeast (**Fig. 1; Appendix 14.1; Volume 3**).

The OS 25-inch map of 1902 (**Fig. 14-3**) shows few changes from the earlier 1842 OS map. The layout of the thirteen fields remains the same and the boundaries remain unchanged. The only difference is the depiction of trees along the western boundary and the removal of a small structure depicted on the earlier map at the northeastern boundary. Similarly, the OS 6-inch map of 1935 (**Fig. 14-4**) shows very little change from the 1902 OS map, other than the removal of one field boundary, thus reducing the number of fields within the area of the proposed development site to twelve.



Figure 14-2: Proposed development site outlined on OS six-inch map of 1842 www.archaeology.ie

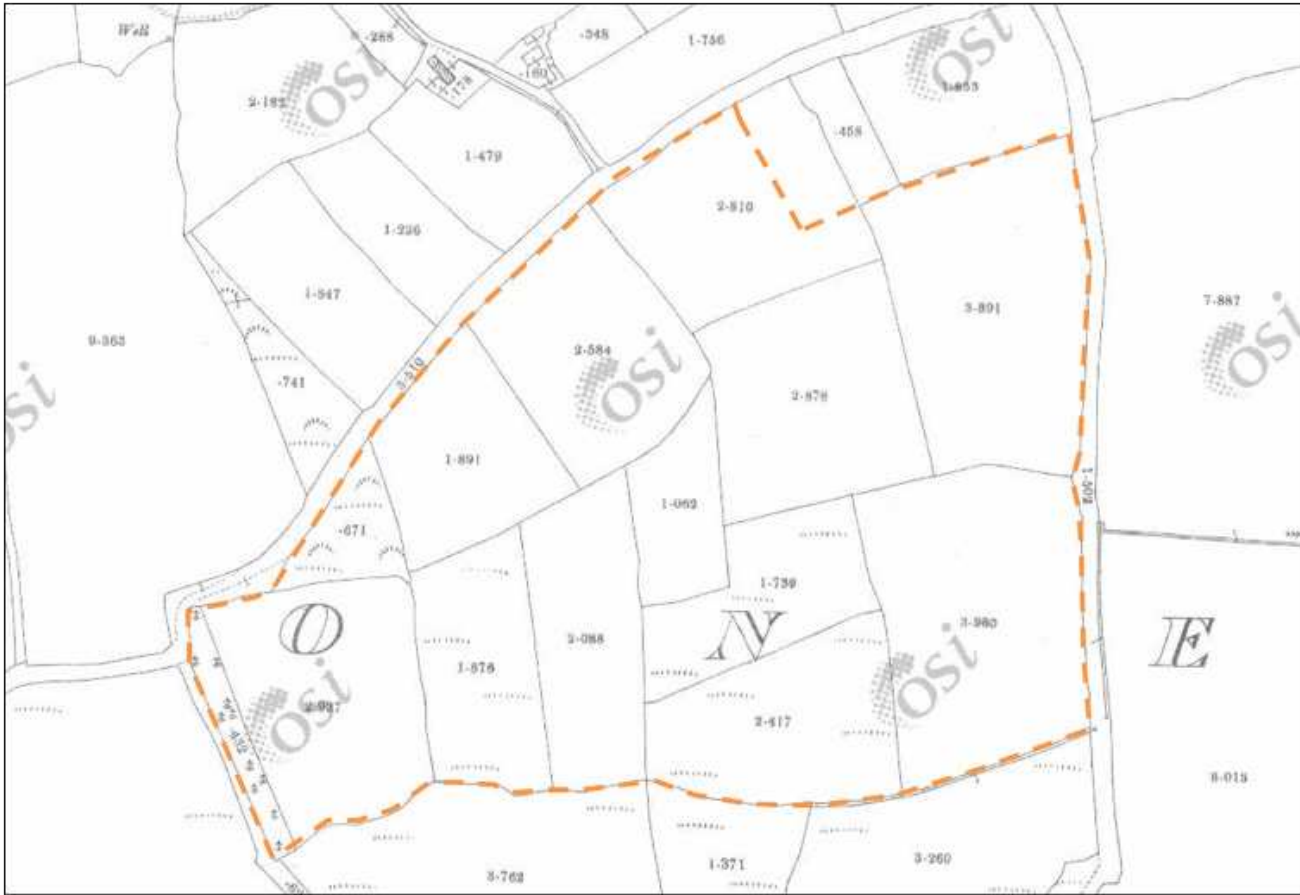


Figure 14-3: Proposed development site outlined on OS 25-inch map 1897-1903 www.archaeology.ie

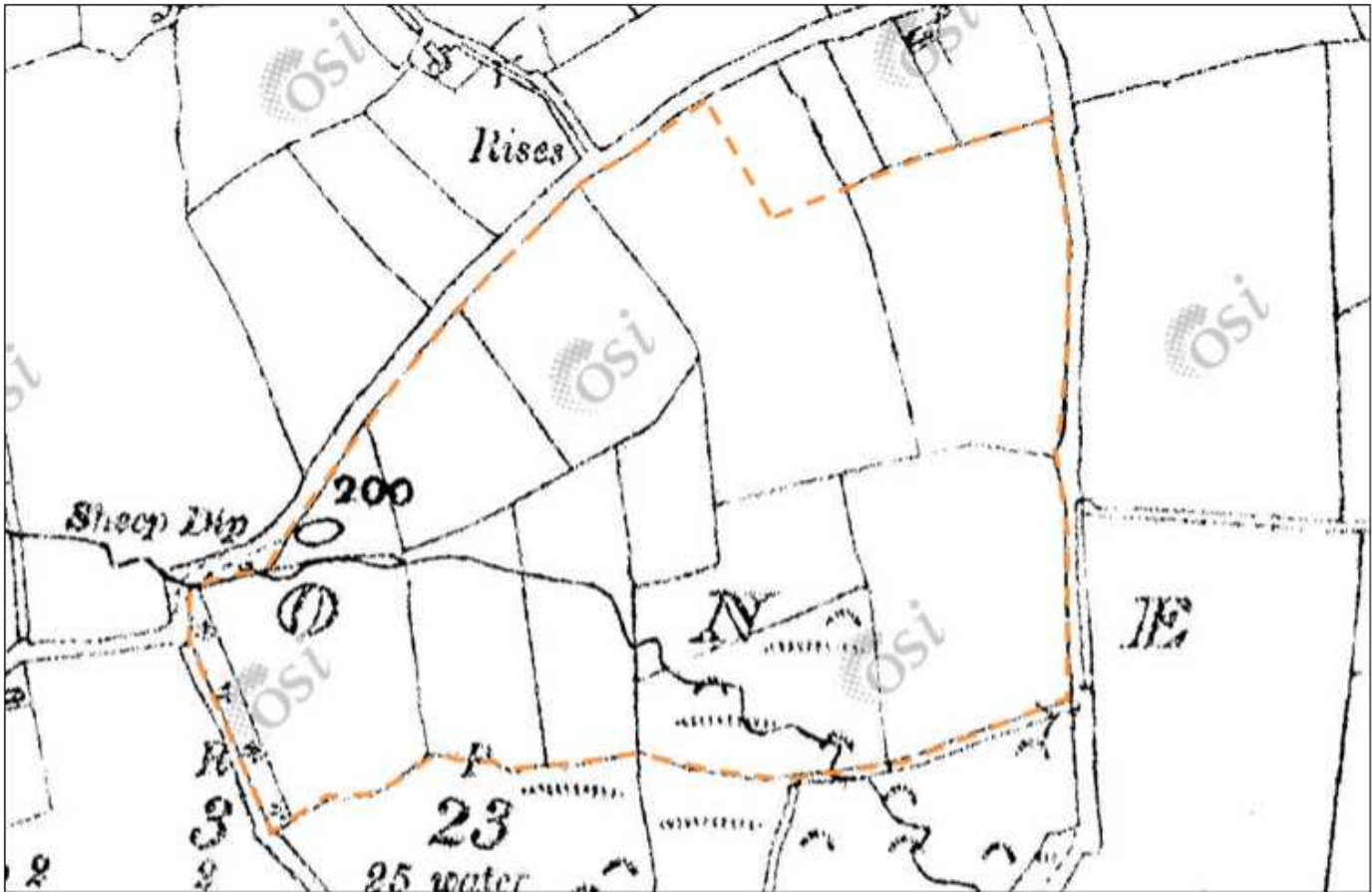


Figure 14-4: Proposed development site outlined on OS six-inch map 1934 www.archaeology.ie

Geophysical Survey

The geophysical survey was undertaken on the proposed development site on the 2nd of August 2024 (Nicholls, 2024). Of the fourteen fields within the proposed development site, three were not surveyed due to environmental conditions; one was heavily wooded and two had poor access and ground conditions (wet and difficult surface) which were unsuitable for survey. The fields which underwent geophysical survey using high-resolution magnetometry were numbered M1-M11. Anomalies of uncertain origin were identified in six fields with a description and likely provenance given as follows;

Field M3 (A, B, C) – ‘Poorly defined linear, potentially a drain or water supply, and clusters of small-scale positives uncertain in origin. B-C likely related to ferrous debris from an adjacent boundary, natural soil/geological variation and/or former cultivation’.

Field M5 (D, E, F) – ‘Positive linear anomaly (D) with adjacent trends, and abundant small-scale positives (E-F). E-F are deemed to be of limited interest, and likely to derive from a combination of recent landuse/cultivation, modern ferrous and/or natural soil/geological variation’.

Field M8 (G) – ‘Small-scale positive and curving trend of uncertain origin. Large-scale modern ferrous is evident N-NE and to the W. Remnants of former cultivation are also apparent throughout’.

Field M9 (H) – ‘Anomaly H highlights 1 of a number of small-scale positives in M9 which are of uncertain origin. These are expected to relate to past landuse, natural soil/geological variation and or modern/ferrous’.

Field M10 (I-J) – ‘Small-scale positives of uncertain origin, likely associated with past landuse, natural soil/geological variation and or modern/ferrous’.

Field M11 (K) – ‘Broad positive response at the north-eastern limit of survey in proximity to an existing boundary. Anomaly K should be targeted for further investigation to confirm its precise origin’.

The geophysical report concluded the following; ‘The geophysical survey at the site of the proposed development in Kilmoney townland has recorded no features of definite archaeological character and no anomalies of significant potential. Poorly defined linear responses, small and large-scale positives of uncertain origin and trends have been recorded. None of these anomalies exhibit patterns typical of buried archaeological remains, and the majority are expected to relate to past cultivation, responses from former/suspected former boundaries, natural soil/geological variation and/or modern ferrous’ (Nicholls, 2024). The report highlighted anomalies A, B, C and K within Fields M3 and M11 (shown on **Fig. 14-5**) as priority areas for targeted archaeological testing (*ibid.*). These anomalies, detected during the geophysical survey, exhibit characteristics that suggest potential subsurface features of archaeological interest. However, their exact origin, function and significance remain undetermined. The result of testing will clarify if these anomalies represent natural features, modern disturbances or archaeological remains.

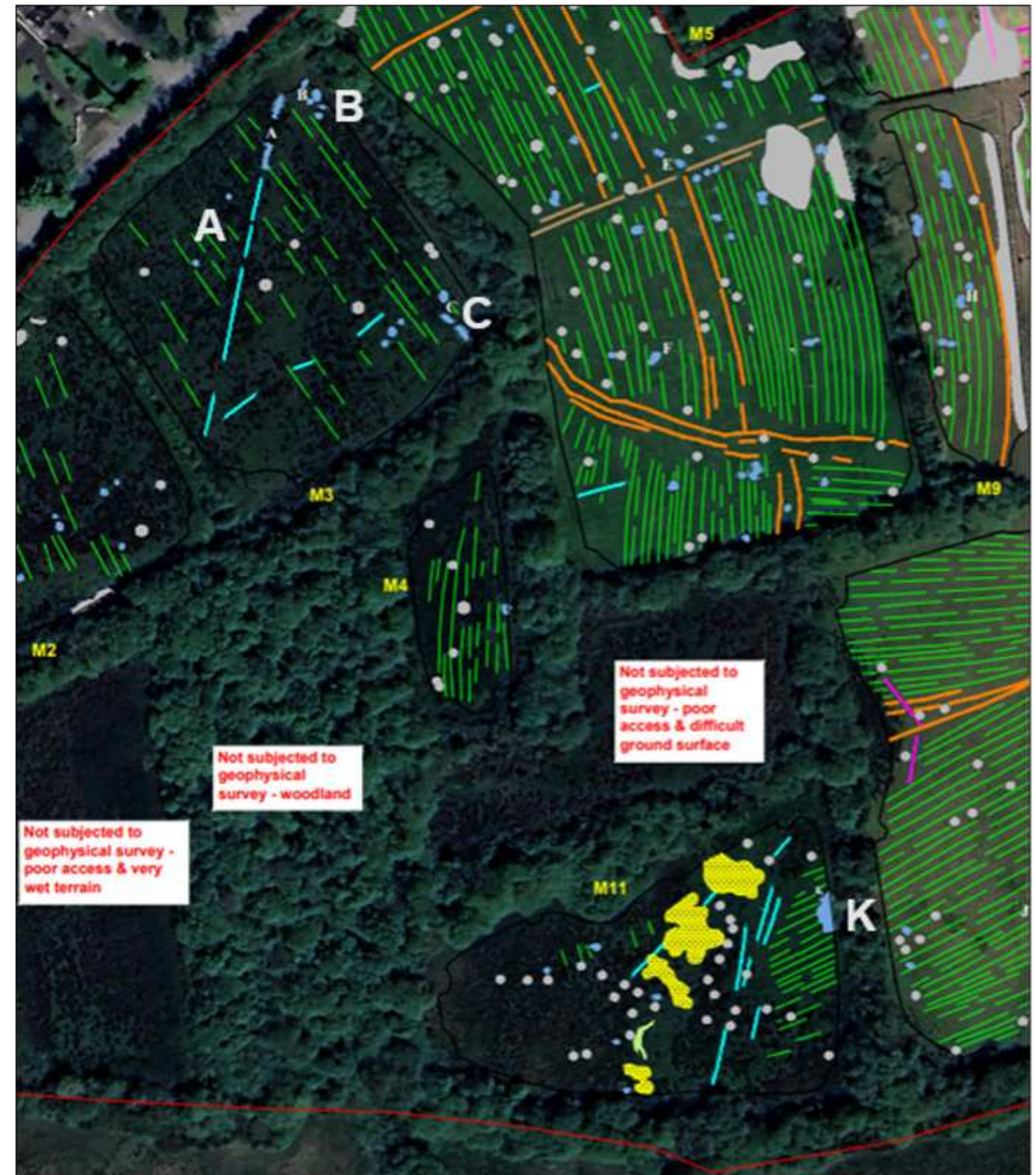


Figure 14-5: Excerpt of Interpretation areas showing location of geophysical anomalies A, B and C in M3 and K in M11 (after Nicholls, 2024)

Walkover Survey

The primary purpose of a walkover survey is to assess the physical environment of the proposed development site and to identify any possible features of cultural heritage significance which have not been previously recorded. Current land use, local topography and environmental conditions are assessed to gain an overall picture of the area. The proposed development site was inspected on the 7th of August 2024 in dry sunny weather conditions and the following observations were made;

The proposed development site is accessed off the R611, Mountain Road, c. 2km to the southwest of the town of Carrigaline. It comprises a total of fourteen fields (**Fig. 14-6**), one of which is under dense woodland and was not inspected. Fields numbered M1-M11 underwent geophysical survey using high-resolution magnetometry as detailed in the geophysical report by Nicholls (2024). The survey aimed to identify potential subsurface archaeological anomalies across these fields. However, Fields 12-14 were deemed unsuitable for geophysical survey due to vegetation cover and ground conditions. To maintain consistency, the numbering system established in the Geophysical Report is used in this report with additional fields numbered sequentially as 12, 13 and 14. A total of thirteen fields were walked, nine of which (M1-M5, M10 and M11, 12 and 13) were found to be under low-lying hummocky rough pasture with pockets of rushes throughout. These fields are enclosed by very dense, wide, extensive hedgerows, one of which is up to 20m in width. The remaining four (M6-M9) at the northeastern side of the proposed development site comprised fenced off level paddocks. There is one area (14) in the southern central section of the proposed development site which is in dense woodland which was not inspected. It is heavily overgrown with trees and briars which obscure the ground surface making the detection of any potential archaeological sites extremely difficult. The woodland will be incorporated as part of an active open space for future residents, featuring amenities such as wooded play areas, exercise stations and seating areas. No archaeological finds or features were noted during the site walkover survey. A photographic record of the observed field conditions is presented in **Appendix 14.3; Volume 3**.



Figure 14-6: Proposed development site on aerial photograph with individual fields numbered www.googlemaps.ie

14.7 The ‘Do Nothing’ Scenario

If development does not proceed, the existing landscape will remain unchanged, preserving its current condition and allowing any potential archaeological sites to remain undisturbed beneath the surface.

14.8 Potential Significant Effects

Demolition Phase

No archaeological, architectural or cultural heritage effects are predicted by the removal of existing modern agricultural sheds along the eastern boundary of the proposed development site.

Construction Phase*Archaeology – Registered archaeological sites*

There are no registered archaeological monuments within the proposed development site. There will be no significant direct or indirect effect on any registered archaeological site during the construction phase.

Archaeology – Potential previously unknown archaeological sites or features

Much of our archaeological heritage survives only as subsurface remains, often unrecorded. The construction phase of the proposed development will involve extensive topsoil stripping and ground reduction, which would directly and negatively impact any previously unknown archaeological remains.

The geophysical survey conducted on the proposed development site identified no definitive archaeological sites. However, several anomalies of uncertain origin, (designated A, B, C and K) were highlighted as potentially archaeological. Due to the unknown and unquantified nature of these anomalies, any impact on them is assessed as direct and negative. Determining the extent and significance of these effects will require further archaeological investigation, an agreed programme of targeted archaeological testing.

The proposed development site is a large greenfield site with the potential to contain subsurface archaeological features. Any ground disturbance carries the risk of uncovering previously unknown archaeological material. The impact on such unrecorded archaeological sites is also assessed as direct and negative with the extent and significance of the effects remaining uncertain pending further archaeological investigation, through archaeological testing.

One area in the southern-central section of the proposed development is densely wooded and was neither visually inspected nor subject to a geophysical survey. This woodland will be incorporated as part of an active open space for future residents, featuring amenities such as a wooded play area, a green amphitheater, a kick-about lawn and an exercise station. These works may impact any surface/subsurface archaeological remains that could exist within this landscape.

Architectural Heritage

There are no protected structures or structures listed in the NIAH or architectural sites of merit within the proposed development site.

There will be no significant direct or indirect effect on any registered architectural site or any structure of architectural merit during the construction phase.

Operational Phase

No archaeological, architectural or cultural heritage effects are expected during the operational phase of the proposed development.

Visual Impact Assessment

There are no known registered archaeological sites within the proposed development area. Within the broader landscape (1km Study Area) there are twenty four recorded archaeological sites, the closest of which is a fulacht fia (CO098-085),

300m to the southwest (**Fig. 14-1**). One of these registered sites has been classified as a redundant record, meaning that, following investigation, it is now deemed to have no archaeological potential.

Of the remaining twenty three registered sites, twelve monuments do not have any visible surface expression. These include seven standing stones, two ringforts, one enclosure, a fulacht fia and a souterrain.

Several upstanding monuments are not visible from the proposed development site, nor can the development site be seen from them, as they are screened by dense vegetation or by nearby existing residential developments. Kilmoney Country House (CO098-016; PS634; NIAH 20909817), the remains of Kilmoney Abbey (CO098-020), and Kilmoney Bridge (NIAH 20909818), located to the northeast of the proposed development site, are situated within mature former demesne woodland. This woodland offers complete screening of views both to and from the proposed development. Additionally, the mature woodland also provides screening for views to and from the ringfort (CO098-015), situated 680m to the northeast.

A ringfort in Kilmoney (CO098-017001), located 370m to the northeast, lies in agricultural land and is bordered by the residential developments of Wrenville to the east and Kilmoney Woods to the west. Views to and from this monument and the proposed development site are obscured by Kilmoney Woods development. Similarly, Kilmoney House (PS 635; NIAH 20909819), situated along Kilmoney Road Lower, 660m to the northeast, has views that have already been impacted by surrounding residential developments.

The substantial hedgerow boundaries within and outside the proposed development site provide ample screening of views to and from other monuments. These monuments, while upstanding, have low visibility in the landscape and are located at sufficient distances such that the proposed development will not impact on their views. These include an enclosure in Kilmoney (CO098-013), 580m to the northwest; a standing stone in Kilmoney (CO098-012), 900m to the south; a vernacular house (CO098-060) in Coolsallagh, 1.4km to the southwest; and three ringforts in Kilmoney - (CO098-014), 1km to the northwest, (CO098-078), 1km to the northeast and (CO098-019), 1.1km to the northeast.

The proposed development is not expected to result in any significant visual impact on the cultural heritage environment.

Cumulative Effects

The cumulative impacts of the proposed development, together with those of permitted or proposed projects in the vicinity, on the cultural heritage environment were assessed. The proposed development will not affect any registered archaeological or architectural sites. However, the impact on any potential subsurface archaeological remains, which may exist beneath the surface, is unknown and unquantified without further investigation, through archaeological testing.

Construction works for the proposed development, as well as those associated with other projects in the area (refer to Chapter 1 for details), will involve large-scale ground disturbance that could uncover previously unknown archaeological features or finds. The combined effect of all these developments could have a cumulative impact on the archaeological landscape. The greater the extent of ground disturbance, the higher the risk of negatively affecting potential subsurface archaeological remains. If such features are preserved by record, they will be permanently removed from the cultural heritage landscape, contributing to an overall negative cumulative effect on the cultural heritage of the local area.

The cumulative impact cannot be fully assessed without understanding the extent, if any, of subsurface archaeological sites which may be identified during construction within the proposed development site and within the permitted developments in nearby areas.

Summary

Based on the findings from the desktop study, geophysical survey and walkover survey, no significant negative effects on cultural heritage are anticipated from the proposed development. However, as highlighted, much of our archaeological heritage exists as subsurface remains, often unrecorded. While the geophysical survey conducted on the proposed development site did not identify any definitive archaeological sites, several anomalies of uncertain origin were highlighted as potentially archaeological and will be subject to archaeological testing. Consequently, the full impact on subsurface archaeological sites cannot be determined without further investigation, through archaeological testing.

Licensed archaeological testing of the proposed development site is scheduled for early 2025, pending the issuing of a licence by the National Monuments Service. The purpose will be to assess the anomalies identified in the geophysical survey and to conduct broader testing across the site. The extent and layout of the testing has been agreed with the County Archaeologist, and the results will be submitted to Cork County Council. If archaeology is identified during the testing program, the County Archaeologist will be contacted immediately. The results of testing will be submitted to the County Archaeologist to determine appropriate mitigation measures. Should significant archaeological remains be detected, further mitigation measures may be required, such as preservation *in situ*, archaeological monitoring, redesign, buffer zones or other mitigation measures as appropriate.

14.9 Mitigation Measures***Incorporated Design Mitigation***

Licensed archaeological testing of the proposed development site is scheduled for early 2025, pending a licence from the National Monuments Service. Should archaeological features or deposits be revealed in the course of these investigations, both the National Monuments Service and the Planning Authority will be consulted. All newly identified archaeological sites will be preserved *in situ* or by record and sufficient time and resources will be allowed to resolve all archaeological matters. Preservation *in situ* will require the relocation of the element of the development beyond the area of archaeological sensitivity. Preservation by record will require the excavation of the archaeological material and such material will be fully resolved to professional standards of archaeological practice (Policy Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht and the Islands). This work will be funded by the developer.

Demolition Phase Mitigation

No archaeological, architectural or cultural heritage effects are predicted during the demolition phase of the proposed development; therefore, no mitigation measures are proposed.

Construction Phase Mitigation

Licensed archaeological monitoring will be conducted within the wooded area (Field 14) during proposed landscaping works. For the remainder of the development site, and based on the results of archaeological testing and consultation with the County Archaeologist, licensed archaeological monitoring may be required during the construction phase. The requirement and extent of this monitoring will be determined based on the findings of archaeological testing and following discussions with the County Archaeologist.

Operational Phase Mitigation

No archaeological, architectural or cultural heritage mitigation is proposed during the operational phase of the proposed development; therefore, no mitigation measures are proposed.

14.10 Residual Impact Assessment***Demolition Phase***

No residual archaeological, architectural or cultural heritage effects are predicted during the demolition phase.

Construction Phase

No residual significant effects on the archaeological, architectural and cultural heritage environment are expected following the implementation of appropriate mitigation measures.

Operational Phase

No residual archaeological, architectural or cultural heritage effects are predicted during the operational phase of the proposed development.

Cumulative Residual Effects

No residual cumulative effects are predicted following implementation of appropriate mitigation measures.

14.11 Risk of Major Accidents or Disasters

No archaeological, architectural or cultural heritage effects are predicted as a result of major accidents and/disasters.

14.12 Worst Case Scenario

Without the effective implementation of mitigation measures, potential subsurface archaeological remains could be irreparably damaged or destroyed during large-scale topsoil stripping and ground reduction associated with construction. This would result in a significant loss of the area's historical and cultural heritage.

14.13 Interactions

No interactions are foreseen.

14.14 Monitoring

Licensed archaeological monitoring will be conducted within the wooded area (Field 14) during proposed landscaping works. For the remainder of the development site, and based on the results of archaeological testing and consultation with the County Archaeologist, licensed archaeological monitoring may be required during the construction phase. The requirement and extent of this monitoring will be determined based on the findings of archaeological testing and following discussions with the County Archaeologist.

14.15 Conclusion

Based on the findings from the desktop study, geophysical survey and walkover survey, no significant negative effects on cultural heritage are anticipated from the proposed development. However, as highlighted, much of our archaeological heritage exists as subsurface remains, often unrecorded. While the geophysical survey conducted on the proposed development site did not identify any definitive archaeological sites, several anomalies of uncertain origin were highlighted as potentially archaeological and will be subject to archaeological testing. Consequently, the full impact on subsurface archaeological sites cannot be determined without further investigation, such as archaeological testing.

Licensed archaeological testing of the proposed development site is scheduled for early 2025. The purpose will be to assess the anomalies identified in the geophysical survey and to conduct broader testing across the site. The extent and layout of the testing has been agreed with the County Archaeologist, and the results will be submitted to Cork County Council. If archaeology is identified during the testing program, the County Archaeologist will be contacted immediately. The results of testing will be submitted to the County Archaeologist to determine appropriate mitigation measures. Should significant archaeological remains be detected, further mitigation measures may be required, such as preservation *in situ*, archaeological monitoring, redesign, buffer zones or other mitigation measures as appropriate.

14.16 References and Sources

Aalen, F.H.A, Whelan, K. & Stout, M. 1997. *Atlas of the Irish Rural Landscape*. Cork University Press.

Department of Arts, Heritage, Gaeltacht & the Islands, 1999. *Framework & Principles for the Protection of Archaeological Heritage*.

Department of Arts, Heritage, Gaeltacht & the Islands, 1999. *Policy and Guidelines on Archaeological Excavation*.

Department of the Environment, Heritage and Local Government, 2004. *Guideline for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment*.

Environmental Protection Agency, 2003. *Advice Notes on Current Practice in the Preparation of Environmental Impact Statements*.

Environmental Protection Agency, 2022. *Guidelines on the information to be Contained in*

Environmental Impact Assessment Reports.

Gwynn, A and Hadcock, R.N. 1970. *Medieval religious houses: Ireland*. Dublin

Hanley, K. and Hurley, M. 2013. *Generations The archaeology of five national road schemes in County Cork Vols. 1 and 2*, National Roads Authority, Dublin.

Quinn, B. & Moore, D. 2007 Ale, brewing and *fulachta fiadh*. *Archaeology Ireland* **21** (3) Issue No 81. 8-11.

Monk, M. 2007. A greasy subject. *Archaeology Ireland* **21**, 22-4.

National Monuments and Historic Properties Service, 1997. *Record of Monuments and Places, County Cork*.

Nicholls, J. 2024. Geophysical Survey Report *Proposed large-scale residential development (LRD) at Mountain Road, Kilmoney townland, Carrigaline, Co. Cork*, Unpublished Report by Target Archaeological Geophysics.

O' Brien, A. F. 1993. 'Politics, economy and society: The development of Cork and the Irish south-coast region c.1170 to c.1583', in O'Flanagan, P. & Buttimer, C. G. (eds) *Cork: History and Society*. 83-156. Geography Publications. Dublin.

Ó Drisceoil, D. 1988 Burnt Mounds: cooking or bathing? *Antiquity* **62**, (237), 671-80.

O' Mahony, S. 1993 *History and Folklore of Carrigaline*. Shannon Park Press. Carrigaline.

Power, D., Lane, S., and Byrne, E., Egan, U., Sleeman, M., with Cotter, E., Monk, J., 1994.

Archaeological Inventory of County Cork Volume 2: East and South Cork. The Stationery Office: Dublin.

Reeves-Smith, T. 1997. The Natural History of Demesnes in Foster, W. eds. *Nature in Ireland, A Scientific and Cultural History*, Lilliput Press, Dublin.

Ronan, S., Egan, U., Byrne, E., *et al.* (2009). *Archaeological Inventory of County Cork, Volume 5*. The Stationery Office, Dublin

Online Sources

ASI Database: National Monuments Service (in progress) Sites and Monuments Database of the Archaeological Survey of Ireland. Department of Arts Heritage and the Gaeltacht www.archaeology.ie

Carroll, M. 2003:0187 – Carrigaline, Cork www.excavations.ie

Cork County Development Plan 2022-2028 www.corkcoco.ie

Down Survey of Ireland, Trinity College Dublin www.downsurvey.tcd.ie

Google maps Ireland online www.google.ie/maps

Heritage Maps Viewer www.heritagemaps.ie

Irish Placenames Database www.loganim.ie

Lane, S. 2002:0318 – Kilmoney, Cork www.excavations.ie

Lewis Topographical Dictionary of Ireland, 1837 www.libraryireland.com

McMahon, 2021. 75 years of Pottery in Carrigaline, in *The Carrigdhoun December 19th 2021* www.carrigdhoun.com

National Inventory of Architectural Heritage www.buildingsofireland.ie

NUI Galway Landed Estates Database www.landedestates.ie

O'Hara, R. 2014:214 – Carrigaline West, Kilmoney, R611 Carrigaline Western Relief Road, Cork www.excavations.ie

O'Hara, R. 2014:456 – Carrigaline West 1-3, Cork www.excavations.ie

O'Hara, R. 2014:457 – Kilmoney 1-2, Cork www.excavations.ie

Ordnance Survey aerial photographs dating to 1995, 1996-2000, 2001-2005, 2006-2012, 2011-2013 and 2013-2018 www.map.geohive.ie

Summary of archaeological excavation from 1970-2024 www.excavations.ie

CHAPTER FIFTEEN

RISK OF MAJOR ACCIDENTS AND DISASTERS



CHAPTER FIFTEEN

Table of Contents

Risk of Major Accidents and Disasters

- 15.1 Introduction..... 15-1
- 15.2 Expertise & Qualifications 15-1
- 15.3 Methodology 15-1
- 15.4 Proposed Development 15-2
- 15.5 Description of Existing Environment 15-2
- 15.6 Environmental Receptors 15-4
- 15.7 Predicted Impacts 15-7
- 15.8 Mitigation Measures 15-7
- 15.9 Residual Impacts..... 15-7
- 15.10 References..... 15-7

Table of Tables

Table 15.1 Description of Impacts and Effects 15-2

Table 17-2 Review of Potential Major Accidents and/or Disasters 15-5

Table of Figures

Figure 15.1 Seismic Movements. Source: Irish National Seismic
Network 15-3

CHAPTER FIFTEEN | Risk of Major Accidents and Disasters

15.1 Introduction

This chapter of the EIAR assesses the vulnerability of the proposed development to be affected by major accidents and disasters (MA&D). It includes an assessment of the potential of the proposed development to cause an increased risk of MA&D, and the likely significant adverse effects arising from potential MA&D.

15.2 Expertise & Qualifications

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants. Ciaran holds a Bachelor of Science (BSc) degree in Government and Politics and a Master's in Planning and Sustainable Development (MPlan), both received from University College Cork. He has over 2 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. He is a member of the Irish Planning Institute.

Directly relevant experience to this proposed development that Ciaran has been involved in is the formation of EIAR's, EIA and AA screening reports for a range of development projects. Relevant project experience includes large housing developments, single 'one – off' developments, submissions to local area plans and county development plans. Ciaran project managed and coordinated the preparation of this EIAR with input from a team of qualified specialists.

15.2.1 Scope of Assessment

The specific objectives of this assessment are as follows:

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."

The Health and Safety Authority (HSA) is the Competent Authority in Ireland as defined by Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015, (COMAH Regulations 2015) which implements the Seveso III Directive in Ireland. The HSA is responsible for ensuring that the impacts of facilities which fall within the remit of this legislation are taken into account with respect to land use planning.

The HSA does not currently consider the proposed development to be a COMAH facility. However, in order to ensure a comprehensive assessment of potential environmental effects due to risks of major accidents and/or disasters as relevant to the development, this chapter presents a review of the characteristics of the proposed development and of the project location to consider potential for accident scenarios that do not fall under COMAH reporting requirements.

15.3 Methodology

In the EIA assessment, consideration is given to both the importance of an attribute and the magnitude of the potential environmental impacts of the proposed activities on that attribute.

The principal attributes (and impacts) to be assessed include the following:

- Localised flooding (potential increase or reduction) and floodplains including benefitting lands and drainage districts (if any).
- Potential Seismic Activity (if any).
- Proximity to any COMAH/SEVESO sites.

COMAH/Seveso sites are defined as industrial sites that, because of the presence of dangerous substances in sufficient quantities, are regulated under the Seveso II Directive.

15.3.1 Legislative Context and/or Source of Guidance

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."

15.3.2 Major Accidents

A major accident can be defined as an acute or chronic accident or disaster, of human or natural origin, which occurs either as a consequence of, or which interacts with, the construction or operation of the proposed Scheme, and which has substantial consequences for people or the environment.

The Seveso III Directive (2012/18/EU) also requires Member States to apply land-use or other relevant policies to ensure that appropriate distances are maintained between residential areas, areas of substantial public use and the environment, including areas of particular natural interest and sensitivity and hazardous establishments (commonly referred to as Seveso sites). For existing establishments, Member States are required to implement, if necessary, additional technical measures so that the risk to persons or the environment is maintained at an acceptable level.

The Health and Safety Authority (HSA) is the Competent Authority in Ireland as defined by Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015, (COMAH Regulations 2015) which implements the Seveso III Directive in Ireland. The HSA is responsible for ensuring that the impacts of facilities which fall within the remit of this legislation are taken into account with respect to land use planning.

Table 15.1 Description of Impacts and Effects

Ref.	Category		Classifications (EPA EIAR Primer Table 3.3)
1.	Quality of Effects	Whether the effect is positive, negative or neutral	Positive, neutral, negative/adverse
2.	Significance	The degree of change relative to existing environmental conditions	Imperceptible, not significant, slight effects, moderate effects, significant effects, very significant, profound effects.
3.	Extent & Context	The area over which an effect occurs and if the effect is unique or, perhaps, commonly or increasingly experienced.	Extent: the size of the area, the number of sites, and the proportion of a population affected by an effect. Context: whether the extent, duration, or frequency will conform or contrast with established (baseline) conditions.
4.	Probability	The likelihood at which an effect could occur	Likely, unlikely.
5.	Duration	The time for which the effect occurs	Momentary, brief, temporary, short-term, medium term, long term, permanent, reversible. Frequency (once / rarely / occasionally / frequently / constantly.
6.	Types of Effects	Impacts on the environment	Direct, indirect, cumulative, 'do-nothing', worst case, indeterminable, irreversible, residual, synergistic.

15.4 Proposed Development

A comprehensive description of the proposed development is presented in Chapter 2 of this EIAR. To summarise, the applicant seeks permission for the following Large Scale Residential Development (LRD) comprising the demolition of existing structures on site and the construction of 362 no. residential units, 1 no. creche with a community room and café and all associated ancillary development works at Mountain Road, Kilmoney (Townland), Carrigaline, Co. Cork.

15.5 Description of Existing Environment

15.5.1 Site Description

The site, which is 12.97 hectares in area, with a net developable area of 10.24 hectares, is located along Mountain Road, in the townland of Kilmoney, Carrigaline, Co. Cork.

The subject land is predominantly a greenfield site which has features and characteristics which will help create a positive living environment by retaining the natural assets and ecological features contained within its parkland setting. There are a number of natural hedgerow boundaries on each side of the site, with an overgrown area located in the centre of the site which provides an opportunity to create a natural and central amenity area

15.5.2 Topography

The site slopes from the southwestern corner of the site towards the north eastern corner. The site has a high point in the southwestern corner of the site 62.5m OD datum to a low point on the north eastern corner of the site of 52.75m OD datum.

15.5.3 Flood Risk

A Site-Specific Flood Risk Assessment has been carried out by OSL Consulting Engineers and is submitted under separate cover.

The following is the summary of the flood risk assessment:

- The site including all proposed residential dwellings is located in Flood Zone C as defined by the requirements of “The Planning System and Flood Risk Management, Guidelines for Planning Authorities” and its Technical Appendices.
- Following the Flood Risk Assessment Stage 2 (Initial Flood Risk Assessment), it was determined that a Justification Test was not required.
- To prevent any potential of flooding within the vicinity from the proposed development, it is proposed to implement SuDS measures as discussed in the Infrastructure Report and Drainage Impact Assessment in order to limit the discharge from the site to the current discharge rates. The implementation of these SuDS measures will not increase the risk of flooding elsewhere. It is considered that the proposed development will have a negligible impact on the potential flood regime of the area.
- In conclusion, the proposed development is considered to have the required level of flood protection up to and including the 1% AEP storm event

The National Flood Hazard Mapping Website www.floodmaps.ie does not show any records of historic flooding occurring at the proposed development site. The nearest recoded flooding event is to the north, in Forest Road which is over 2km downstream of the subject site

15.5.3.1 Tidal Flood Risk

The CFRAMS Map in indicates that the proposed development site lies outside of the 0.1% AEP coastal flood event and hence is located within Flood Zone C for tidal flood risk, where the risk of flooding is low.

15.5.3.2 Fluvial Flood Risk

The CFRAMS Map indicates that the proposed development site lies outside of the 0.1% AEP fluvial flood event and hence is located within Flood Zone C for fluvial flood risk, where the risk of flooding is low.

15.5.3.3 Groundwater Flood Risk

The aquifer vulnerability map classifies the site as having a moderate to extreme vulnerability and there is no historical evidence of groundwater flooding at the site. There is no indication on the maps of any springs or wells on this site. Groundwater risk is therefore not considered to be significant.

15.5.3.4 Pluvial Flood Risk

The Flood Maps data shows no indication of previous pluvial related flooding at the site. During extreme rainfall events the application of SuDS principles will ensure surface water is managed sufficiently and sustainably discharged to the drainage network in accordance with the GDSDS. With these mitigation measures in place pluvial flood risk is not considered to be significant.

15.5.4 Seismic Activity

Much of the Earth’s surface is covered by unconsolidated sediments which can be especially prone to instability. Water often plays a key role in lubricating the slope failure. Instability is often significantly increased by man’s activities in building houses, roads, drainage and agricultural changes. Landslides, mud flows, bog bursts (in Ireland) and debris flows are a result.

In general, Ireland suffers few landslides. Landslides are more common in unconsolidated material than in bedrock, and where the sea constantly erodes the material at the base of a cliff landslides and falls lead to recession of the cliffs. Landslides have also occurred in Ireland in recent years in upland peat areas due to disturbance of peat associated with construction activities.

In Ireland, seismic activity is recorded by the Irish National Seismic Network. The Geophysics Section of the School of Cosmic Physics, Dublin Institute for Advanced Studies (DIAS) has been recording seismic events in Ireland since 1978. The station configuration has varied over the years. However, currently there are five permanent broadband seismic recording stations in Ireland including IWEX on Carrickbyrne Hill, Co. Wexford, running from 01/01/2011 and operated by DIAS. The seismic data from the stations comes into DIAS in real-time and are studied for local and regional events.

As can be seen in Figure 15.1 below, the principal events have occurred along/ beyond the east, south-east and south of Ireland with seismic movements generally up to 2.9 Magnitude recorded on land with no large seismic events recorded in the immediate vicinity of the subject site.

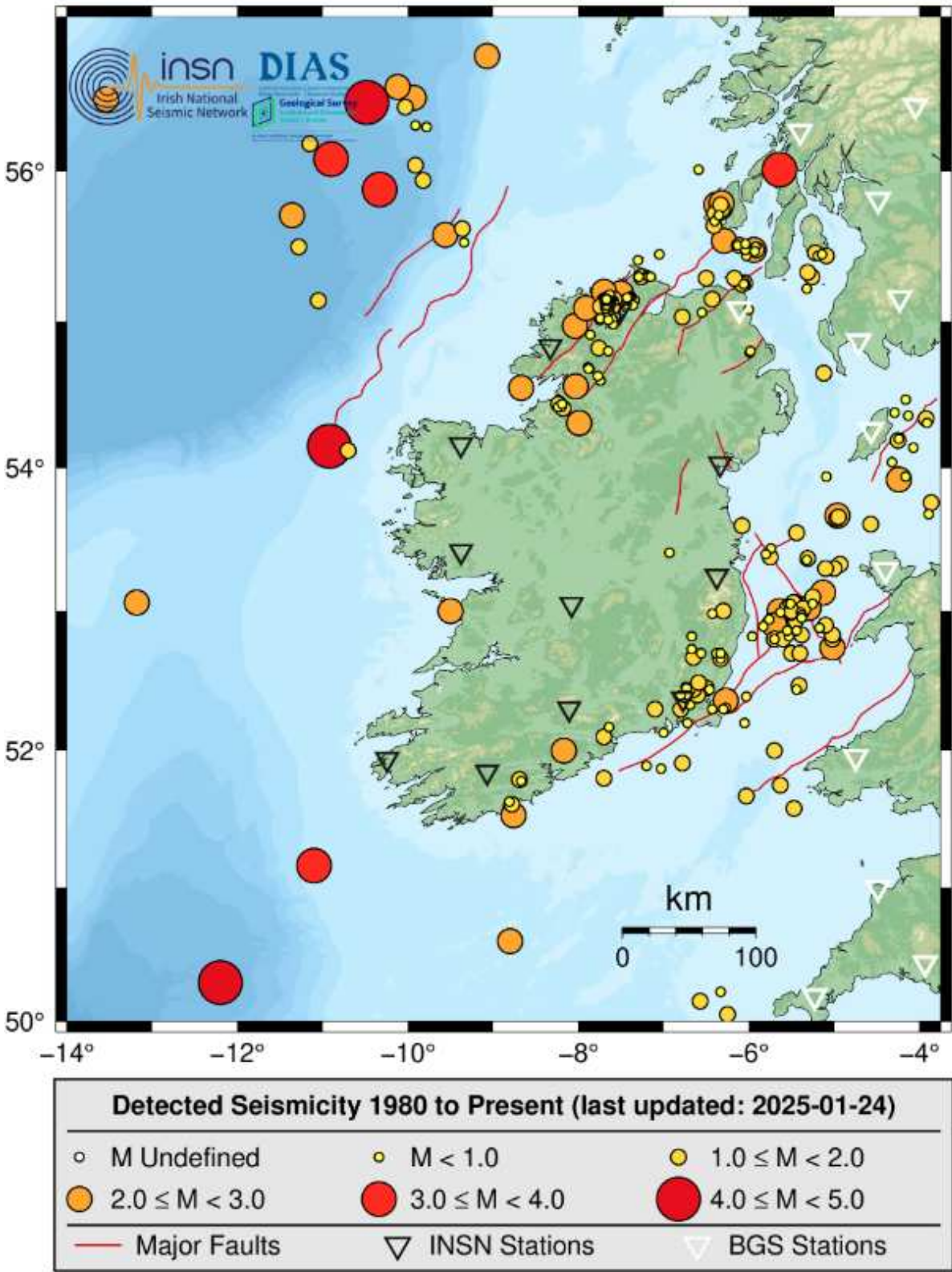


Figure 15.1 Seismic Movements. Source: Irish National Seismic Network

15.5.5 COMAH/SEVESO Sites

The Seveso Directive (Directive 82/501/EEC, Directive 96/82/EC, Directive 2012/18/EU) was developed by the EU after a series of catastrophic accidents involving major industrial sites and dangerous substances. Such accidents can give rise to serious injury to people or serious damage to the environment, both on and off the site of the accident. The Chemicals Act (Control of Major Accident Hazards involving Dangerous Substances) Regulations 2015 (S.I. No. 209 of 2015) (the “COMAH Regulations”), implement the latest Seveso III Directive (2012/18/EU).

The purpose of the COMAH Regulations is to transpose the Seveso Directive into Irish law and lay down rules for the prevention of major accidents involving dangerous substances, and to seek to limit as far as possible the consequences for human health and the environment of such accidents, with the overall objective of providing a high level of protection in a consistent and effective manner.

There are two tiers of establishment, which are related to the quantities of dangerous substances present. Depending on quantity, an establishment may be upper-tier or lower-tier. Upper-tier establishments have greater quantities of dangerous substances present and therefore are obliged to comply with additional requirements specified in the Regulations. Lower-tier establishments have lower quantities of dangerous substances present.

There are 29 no. Seveso sites (14 no. lower tier and 15 no. upper tier) located Cork County Council administrative area.

There are no Seveso sites in close proximity to the proposed development. The closest to the subject site is the Carbon Chemicals Group Limited which is a ‘lower tier establishment’ and is over 5.6km from the subject site, located in Ringaskiddy, Co. Cork. The most recent COMAH inspection of the premises was in October 2024. In event of an emergency HSA Regulation 25 information for Carbon Chemical Group Limited states the following:

“The public likely to be affected will be warned by one or more on-site sirens. / Information on what to do in the event of a major accident is available at the website listed immediately below (www.carbon.ie)”

Given the low risk and ‘lower tier’ nature of Carbon Chemicals Group Limited premises and the distance to the proposed development, it is not considered a concern for the proposed development at construction or operational phase.

The proposed development has been designed in accordance with the Safety, Health and Welfare at Work Act 2005 (S.I. 10 of 2005) as amended and the Safety, Health and Welfare at Work (General Application) Regulations 2007 to 2016 (S.I. 299 of 2007, S.I. 445 of 2012, S.I. 36 of 2016) as amended and associated regulations.

15.6 Environmental Receptors

The EIAR chapters within this report identify that the proposed development has been designed in accordance with best practices and that it 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 Department of Defence 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 17-2 lists the major accidents and/or disasters reviewed.

Table 17-2 Review of Potential Major Accidents and/or Disasters

Major Accident or Disaster	Relevant for this Proposed Development?	Why relevant?	Potential Receptor	Covered within EIAR?
Civil				
Large Crowd Event (An event with over 5,000 people)	N	Not considered vulnerable due to the nature of the Proposed Development i.e., a residential development including 362 no. units, childcare facility and 1 café	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.	Local water users	Chapter 10 Water and Hydrology of this EIAR identifies the control measures required to avoid contamination of water supplies.
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
Transportation				
Maritime Incident	N	The closest port is Cork Port which is located approximately 7km south west of the site.	N/A	N/A
Air Incident	N	The closest airport is Cork airport located approximately 7km southwest.	N/A	N/A
Transport Hub (Includes Airports, Ports and Rail Stations)	N	The site is located approximately 7km to the south east of Cork Airport	N/A	N/A
Natural				
Cultural, Archaeological and Architectural Heritage	N	There are no sites listed on the Sites and monuments Record (SMR) or the National Inventory of Architectural Heritage (NIAH) relative to the site. The site is not located in an Architectural Conservation Area.	Cultural Heritage	Chapter 14 Cultural Heritage of this EIAR assesses impact of the Proposed Development on the Archaeological and Cultural Heritage and proposes mitigation measures where required. No archaeological, architectural or cultural heritage effects are predicted as a result of major accidents and/disasters.
Landslides	N	Geological Survey Ireland (GSI) has mapped the area as being of “Made” ground and is not located in an area with landslide susceptibility.	Residents, service users, members of the public and nearby properties.	Chapter 9 Land and Soils of this EIAR assessed the vulnerability of the Proposed Development to landslides. The GSI database indicates that the subject site is located within an area of ‘Low’ susceptibility to landslides. Thus, the impacts of landslides to the Proposed Development are considered ‘neutral’ ‘imperceptible’ and ‘permanent’.
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	Y	The site is classified as Flood Zone C, where the probability of flooding is low, and the Proposed Development does not require a justification test as it falls outside Flood Zones A and B.	Proposed Development and surrounding developments.	Chapter 10 Water and Hydrology of this EIAR identifies the vulnerability of the project to flooding. There is no identified risk of flooding at the site of the Proposed Development.
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 during the construction phase and vehicular emissions during the construction and operational phase.	Residents/ workers	Chapter 12 (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.	Residents, service users, members of the public and nearby properties.	A fire evacuation strategy will be put in place in advance of occupancy. Access routes serving the Proposed Development have been designed to provide adequate space for the Fire Brigade.
Invasive species	Y	There are no recorded third schedule invasives species recorded on the site	N/A	Chapter 11 (Biodiversity) of this EIAR identifies the assessment of invasive species on site and any mitigation measures required.
Technological				
Structural Collapse (Building)	N	The design criteria of the buildings will be in accordance with all relevant building design standards. No further assessment is required.	N/A	N/A
Structural Collapse (Dam, Bridge, Tunnel)	N	Not considered vulnerable as no dams, bridges or tunnels are proposed as part of the development.	N/A	N/A
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 7 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 7 Material Assets – Utilities contains information on communications
Utilities failure (water supply)	N	Not considered vulnerable	N/A	Chapter 10 Water and Hydrology and Chapter 7 Material Assets – Utilities contains information on water supply
Utilities failure (wastewater, sewage)	N	Not considered vulnerable	N/A	Chapter 7 Material Assets contains information on wastewater management
Utilities failure (solid waste)	N	Not considered vulnerable	N/A	Chapter 8 Material Assets contains information on waste management
Industrial accidents (defence, energy, oil and gas refinery, food industry, chemical industry, manufacturing, quarrying, mining)	Y	The closest Seveso site to the proposed development Carbon Chemicals Group., is a lower tier site (approx. 5.6m northeast).	N/A	Section 15.5.5 of this chapter details potential major emergency management

15.7 Predicted Impacts

The potential impacts of the construction and operational phases of the Proposed Development are outlined below.

15.7.1 Do Nothing Scenario

The site will remain as underutilized greenfield area.

15.7.2 Construction and Demolition Phase

No scenarios of concern have been identified during the construction phase. As such the predicted impact is considered to be short term, imperceptible and neutral.

15.7.3 Operational Phase

The proposed development is not located in an area prone to flooding or an area prone to seismic events or within close proximity to a COMAH/Seveso site. As such, these accident scenarios are not of concern.

15.7.4 Cumulative Effects

Cumulative impacts are considered imperceptible and neutral.

15.8 Mitigation Measures

15.8.1 Construction Phase

No mitigation measures necessary.

15.8.2 Operational Phase

Mitigation measures have been designed into the proposal. No further mitigation measures necessary.

15.8.3 Monitoring

No monitoring proposed.

15.9 Residual Impacts

Control measures will be 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. The potential for dust or noise from the site operations to cause any nuisance to nearby receptors is deemed to be negligible and the adherence and full implementation of the appropriate control and mitigation measures will ensure there is no potential for cumulative effects to arise.

15.10 References

- Department of Defence 'National Risk Assessment for Ireland 2023' (2023).
- EPA 'Guidelines on the Information to be contained in Environmental Impact Assessment Reports' (2022).
- EPA 'Draft Advice Notes on Current Practice in the Preparation of Environmental Impact Statements' (2015).
- National Roads Authority (NRA) 'Guidelines on Procedures for the Assessment and Treatment of Hydrology for National Road Schemes' (2009).
- Office of Public Works (OPW, www.floodinfo.ie).
- Irish National Seismic Network (INSN, www.insn.ie)
- Engineering Reports prepared by OSL Consulting Engineers.
- Flood Risk Assessment prepared by OSL Consulting Engineers.

CHAPTER SIXTEEN

INTERACTIONS OF THE FOREGOING



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER SIXTEEN

Table of Contents

Interactions of the Foregoing

16.1 Introduction..... 16-1

16.2 Population and Human Health 16-1

16.3 Landscape and Visual 16-1

16.4 Material Assets: Traffic and Transport 16-1

16.5 Material Assets: Built Services..... 16-1

16.6 Material Assets: Waste 16-2

16.7 Land and Soils 16-2

16.8 Water & Hydrology..... 16-2

16.9 Biodiversity 16-2

16.10 Noise and Vibration..... 16-2

16.11 Air Quality and Climate 16-3

16.12 Cultural Heritage – Archaeological and Built Heritage 16-3

Table of Tables

Table 16.1 Interactions with Potential for Significant
Impacts Before the Implementation of Mitigation Measures.....16-4

CHAPTER SIXTEEN | Interactions of the Foregoing

16.1 Introduction

The construction, operational and cumulative impacts of the proposed development have been assessed within each chapter of the EIAR. This chapter considers the significant interactions of impacts between each of the separate disciplines.

In practice many impacts have slight or subtle interactions with other disciplines. This chapter highlights in Table 16.1 (located at the end of this section) those interactions which are considered to potentially be of a significant nature. Discussions of the nature and effect of the impact is primarily undertaken within each of the relevant chapters, while this chapter identifies the most important potential interactions.

This chapter was prepared by Ciaran Dineen of McCutcheon Halley Chartered Planning Consultants with input from the lead author of each assessment.

16.2 Population and Human Health

During the construction phase, the following aspects have potential to interact with population and human health:

- Landscape & Visual: Construction processes and plant such as cranes used during the construction phase may give rise to visual impacts.
- Traffic & Transport: Increased construction traffic movements on the local road network during the construction phase may give rise to noise, dust, and road s
- Land & Soils: 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
- Material Assets: Waste: The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers.
- Noise and Vibration: There is potential for effects on human health associated with noise during the construction phase which may impact upon amenity.
- Water and Hydrology: The increased population density could heighten the potential for flood-related health impacts, particularly during construction. Pollution events can impact the water quality and thus impact the human health of the surrounding population.

During the operational phase, the following aspects have potential to interact with population and human health:

- Landscape & Visual: The landscape plan will impact the quality of the private, communal and public open spaces, which could impact people's health and well-being.
- Traffic & Transport: The proposed development's proximity to services, amenities, and public transport would interact with patterns of traffic and transport locally during the operational phase. Traffic flows within the site have the potential to create safety risks for pedestrians and cyclists.
- Air Quality & Climate: Energy efficient design within the proposed development may give rise to reduced electricity consumption by future residents, potentially decreasing dependence on fossil fuels for energy generation, resulting in significant CO2 savings. There is potential for impact on human health from a deterioration in air quality associated with emissions from vehicles.

No other potential significant interactions have been identified other than that described above. The potential significant impacts on population and health have been considered within the relevant discipline and mitigation measures outlined where required.

16.3 Landscape and Visual

Chapter 5 assess the likely potential impacts on landscape and any visual impacts arising from the proposed development. During the construction and operational phase, the following aspects have potential to interact with landscape and visual:

- Cultural Heritage: Elements of the Cultural Heritage chapter may interact with the Landscape and Visual amenity offered in this location. These are the designated monuments surrounding the proposed development site. The interaction is expected to be *negligible* and therefore not significant.

No other potential significant interactions have been identified other than that described above. The potential significant impacts on landscape and visuals have been considered within the relevant discipline and mitigation measures outlined where required.

16.4 Material Assets: Traffic and Transport

Chapter 6 assesses the likely impacts on Traffic and Transport arising from the proposed development. During the construction and operational phase, the following aspects have potential to interact with traffic and transport:

- Population and Human Health: There is potential of a risk to public health due to greater traffic volumes and worsening air quality during the construction phase of the development.
- Air Quality and Climate: There is potential of worsening air quality during the construction and operational phase of the development as a result of increased traffic.
- Biodiversity: There is potential of risk to wildlife as a result of traffic associated with the construction and operational phase of the development.
- Noise and Vibration: There is potential for an increase in noise due to increased traffic during the construction phase.

No other potential significant interactions have been identified other than that described above. The potential significant impacts on Traffic and Transport have been considered within the relevant discipline and mitigation measures outlined where required.

16.5 Material Assets: Built Services

Chapter 7 assesses the likely impacts on Services and Infrastructure arising from the proposed development. During the construction and operational phase, the following aspects have potential to interact with built services:

- Water and Hydrology: The likely interactions between Material Assets and other environmental factors include interactions between the proposed drainage and wastewater arrangements and Chapter 10: Water and Hydrology. During the construction and operational phase of the development there is potential for the drainage and wastewater arrangements

No other potential significant interactions have been identified other than that described above. The potential significant impacts on Services and Infrastructure have been considered within the relevant discipline and mitigation measures outlined where required.

16.6 Material Assets: Waste

Chapter 8 assesses the likely impacts on Waste arising from the proposed development. During both the construction and operational phases, the following aspects have potential to interact with built services:

- Population and Human Health: The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers
- Biodiversity: The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity.
- Land & Soils: Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated from the Site.
- Traffic & Transport: 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 affect the surrounding road network.

No other potential significant interactions have been identified other than that described above. The potential significant impacts on Waste have been considered within the relevant discipline and mitigation measures outlined where required.

16.7 Land and Soils

Chapter 9 assesses the likely impacts on Land & Soils arising from the proposed development. During the construction phase, the following aspects have potential to interact with land and soils:

- 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.
- Biodiversity: There are 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.
- Water and Hydrology: 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.
- Air Quality & 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
- 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 residential and retail / commercial land use with associated landscaping. This may have potential to impact on the landscape and visuals of the receiving landscape.
- Material Assets: Traffic and Transport: Where required, unsuitable soil and subsoil will be removed offsite in accordance with all statutory legislation. There is also a requirement to import soil, subsoil and aggregate materials during the construction phase of the Proposed Development. This will require additional traffic to and from the site .

No other potential significant interactions have been identified other than that described above. The potential significant impacts on Land and Soils have been considered within the relevant discipline and mitigation measures outlined where required.

16.8 Water & Hydrology

Chapter 10 assesses the likely impacts on Water and Hydrology arising from the proposed development. During the construction and/or operational phase, the following aspects have potential to interact with water & hydrology:

- Population and Human Health: Pollution events can impact the water quality and thus impact the human health of the surrounding population. There is a potential that the increased population density could heighten the potential for flood-related health impacts, particularly during construction.
- Land and Soils: During the demolition and construction phase (i.e., earthworks), heavy rainfall events have the potential to mobilise contaminated run-off and impact on the usability of materials stored onsite. This could therefore require the importation of additional material from external sources.
- Biodiversity: There is potential that the proposed development could have an impact 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.
- Material Assets: Built Services: There is a risk of excess silts from construction runoff accumulating in the existing drainage network, potentially compromising its capacity.

No other potential significant interactions have been identified other than that described above. The potential significant impacts on Water and Hydrology have been considered within the relevant discipline and mitigation measures outlined where required.

16.9 Biodiversity

Chapter 11 assesses the likely impacts on Biodiversity arising from the proposed development.

The potential significant impacts to Biodiversity have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant negative impacts are predicted.

16.10 Noise and Vibration

Chapter 12 assesses the likely impacts on Noise and Vibration arising from the proposed development. During the construction and operational phases, the following aspects have potential to interact with noise and vibration:

- Population and Human Health: Noise and Vibration arising from the construction phase has the potential to impact the amenity of local residents
- Traffic and Transport: Construction traffic may give rise to local noise and vibration which may have an impact on the amenity of local residents.
- Biodiversity: Construction noise and vibration may impact local biodiversity.

No other potential significant interactions have been identified other than that described above. The potential significant impacts on Noise and Vibration have been considered within the relevant discipline and mitigation measures outlined where required.

16.11 Air Quality and Climate

Chapter 13 assesses the likely impacts on Air Quality and Climate arising from the proposed development. During the construction and operational phases, the following aspects have potential to interact with air quality and climate:

- Population and Human Health: During construction phase there is the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants.
- Land and Soils: During construction phase activities such as land clearing, excavations, stockpiling of materials etc. have the potential for interactions between air quality and land and soils in the form of dust emissions.
- Biodiversity: The construction phase has the potential to interact with flora and fauna in adjacent habitats and designated sites due to dust emissions arising from the construction works.
- Waste: GHG emissions from both the construction and operational phases may arise and have potential to impact on air quality.
- Traffic and Transport: Traffic-related pollutants may arise from the construction and operational phases which have potential to impact on air quality and climate.

No other potential significant interactions have been identified other than that described above. The potential significant impacts on Air Quality and Climate have been considered within the relevant discipline and mitigation measures outlined where required.

16.12 Cultural Heritage – Archaeological and Built Heritage

Chapter 14 assesses the likely impacts on Cultural Heritage arising from the proposed development.

According to Chapter 14, no interactions between this chapter and other relevant chapters are foreseen. The potential significant impacts on Cultural Heritage have been considered within the relevant discipline and mitigation measures outlined where required.

Table 16.1 Interactions with Potential for Significant Impacts Before the Implementation of Mitigation Measures

Interaction	Population & Human Health		Landscape		Material Assets- Traffic		Material Assets- Built Services		Material Assets: Waste		Land & Soils		Water		Biodiversity		Noise & Vibration		Air Quality & Climate		Cultural Heritage	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Population & Human Health			X	X	X	X			X		X		X	X			X			X		
Landscape and Visual																					X	X
Material Assets- Traffic	X	X													X	X	X		X	X		
Material Assets- Built Services													X	X								
Material Assets: Waste	X				X						X				X	X						
Land & Soils	X		X	X	X								X		X				X			
Water	X	X					X				X				X							
Biodiversity					X	X	X	X			X		X				X		X			
Noise & Vibration	X				X										X							
Air Quality & Climate	X				X	X			X	X	X				X							
Cultural Heritage																						
Con. - Construction Phase Op. - Operational Phase																						

CHAPTER SEVENTEEN

SUMMARY OF PROPOSED MITIGATION MEASURES



McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

CHAPTER SEVENTEEN

Table of Contents

Summary of Proposed Mitigation Measures

17.1 Introduction..... 17-1

Table of Tables

Table 17.1 Summary of Construction Phase Mitigation 17-1

Table 17.2 Summary of Operational Phase Mitigation 17-12

Table 17.3 Summary Incorporated Design Mitigation 17-15

CHAPTER SEVENTEEN | Summary of Proposed Mitigation Measures

17.1 Introduction

A key objective of the Environmental Impact Assessment process is to identify likely significant environmental impacts at the pre-consent stage and where necessary to propose measures to mitigate or ameliorate such impacts. This chapter of the EIAR summarises the proposed mitigation measures set out in Chapters 4 to 14.

All the mitigation measures proposed within the individual specialists’ assessments will be incorporated into the Construction and Environmental Management Plan (CEMP) prior to works commencing on-site.

Table 17.1 Summary of Construction Phase Mitigation

Aspect	Mitigation
Population & Human Health	An Outline Construction and Environmental Management Plan (CEMP), Outline Resource Waste Management Plan (RWMP) and Operational Waste Management Plan (OWMP) for the proposed development are included in the planning application documentation. The CEMP, RWMP & OWMP will be further updated by the contractor, agreed with Cork County Council prior to commencement, and implemented by the selected contractor after any consent is received. All construction personnel will be required to understand and implement the requirements of the CEMP and RWMP and shall be required to comply with all legal requirements and best practice guidance for construction sites. The CEMP provides for a construction phase management structure to ensure that environmental protection and mitigation measures are put in place. The CEMP requires that these measures will be checked, maintained to ensure adequate environmental protection. The CEMP also requires that records will be kept and reviewed as required to by the project team and that the records will be available on site for review by the planning authority. All construction personnel will attend induction and training classes as required to ensure that the CEMP is effectively implemented. The CEMP will comply with all appropriate legal and best practice guidance for construction sites.
Landscape & Visual	No significant landscape or visual impacts are expected during all phases of the proposed development. The retained vegetation along with the proposed landscape and planting plans will mitigate against negative landscape and visual impacts. Therefore, no mitigation is required.
Material Assets: Traffic & Transport	During construction, mitigation measures will include a construction traffic management plan, optimized routing of HGVs, and temporary parking solutions for construction workers. Traffic impacts during the construction phase will be minimized through the implementation of a Construction Traffic Management Plan (CTMP), which will be agreed upon with CCC. A Framework CTMP, outlining the key principles to be followed, is included as part of the application package. The following measures will help minimize the impact of HGV traffic on Mountain Road: • Scheduled Deliveries: HGV deliveries will be planned, as much as possible, outside of peak traffic periods, which have been identified as 08:00 – 09:00 and 16:30 – 17:30. • Dust and Debris Control: Wheel washing facilities will be provided on site to reduce the transfer of dust and debris onto local roads. Additionally, a road sweeper will be deployed as needed to ensure the local road network remains clear. • Warning Signage: Signs will be placed along Mountain Road to alert all road users and local residents of the presence of slow-moving and turning HGV traffic. Further warning signs will be installed ahead of the Site Access junction to notify drivers approaching from both directions.
Material Assets: Built Services	A Construction and Environmental Management Plan (CEMP) has been prepared and submitted with this application. The final CEMP, which will include any additional construction phase mitigation measures required pursuant to conditions attached to any grant of permission, along with all measures currently set out in the CEMP, will be implemented in full. Site inductions for all construction staff and sub-contractors aim to ensure all are aware of the procedures and best practices as outlined in the CEMP. Control measures shall be put in place to protect surface waters from contamination prior to the commencement of any site works. Control measures will also be provided to control surface run-off during the construction phase. These proposed measures follow best practice and are set out in full in the CEMP. With regards to mitigation measures relating to Surface Water Drainage, Wastewater Drainage and Water Supply, the following mitigation measures will be taken, in summary: • Implement the Resources and Waste Management Plan (RWMP) • Liaise with all relevant Statutory Authorities and Service Providers prior to commencement of construction • Create and implement a surface water drainage construction quality control system • Implement the Uisce Eireann Quality Assurance system for construction of wastewater and water supply services With regards to Electricity Supply and Telecommunications, the following mitigation measures will be provided, in summary: • Implement the ESB Quality Assurance system for construction of electrical services infrastructure • Implement the Openeir Quality Assurance system for construction of telecommunication services infrastructure.

Aspect	Mitigation
Material Assets: Waste	The measures outlined in the Construction Environmental Management Plan (CEMP) and Resource Waste Management Plan (RWMP) will be implemented in full as part of the mitigation strategy for the site. These mitigation measures will ensure that the waste arising from the Construction Phase of the proposed development is dealt with in compliance with provisions of the Waste Management Act 1996, as amended, associated Regulations and Litter Pollution Act 1997, and The National Waste Management Plan for a Circular Economy 2024-2030. The mitigation measures will also ensure optimum levels of waste reduction, reuse, recycling and recover are achieved and will promote more sustainable consumption of resources.
Land & Soils	During the demolition and construction phase, all works will be undertaken in accordance with the Outline Construction and Environmental Management Plan (OCEMP) (OSL, 2025b) and Outline Resource and Waste Management Plan (ORWMP) (OSL, 2025c) submitted with the planning application. Following appointment, the contractor will be required to further develop the OCEMP and ORWMP to provide detailed construction phasing and methods to manage and prevent any potential emissions to ground and surface water. Import of Fill Materials: Contract and procurement procedures will ensure that all imported soil, subsoil and aggregate 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 soil, subsoil and aggregate 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. Soil Quality and Structure Excavated soil and subsoil will be carefully managed and maintained in order to minimise potential impact on soil quality and soil structure. As documented in the OCEMP (OSL, 2025b), the stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development. At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas. Disturbed subsoil layers will be stabilized as soon as practicable (e.g. backfill of service trenches, construction of road capping layers, construction of building foundations and completion of landscaping). The duration for which subsoil layers are exposed is to be minimised in order to mitigate against weather effects. Stockpiles of excavated soil and subsoil material will be protected for the duration of the works (refer to Section 9.9.1.5 of Chapter 9) and will be strategically located to minimise double handling. Furthermore, stockpiles of subsoil material will be located separately from topsoil stockpiles. Airborne Dust Handling of soils will be undertaken in accordance with documented procedures that will be set out in order to protect the ground and minimise airborne dust. As outlined in the OCEMP (OSL, 2025b), 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. The Contractor will be required to produce an Air Quality and Dust Management Plan including Best Practice Measures to control dust and in particular, measures to prevent dust nuisance. The principal objective of the Air Quality and Dust Management Plan will be to ensure that dust emissions do not cause significant nuisance at receptors near the Proposed Project. A dust deposition monitoring programme will be implemented during the construction phase in order to verify the continued compliance with relevant standards and limits. Potential impacts and avoidance and mitigation measures associated with the generation of dust are addressed in Chapter 13 of this EIAR. Reuse of Soil Subsoil materials to be reused within the Proposed Development (i.e., to achieve formation levels and for landscaping on site) will be subject to the assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. Management and Control of Soils and Stockpiles Segregation and storage of soil and subsoil for re-use onsite or removal offsite and waste for disposal offsite will be segregated and temporarily stored onsite pending removal or for reuse onsite. Where possible, stockpiling of soils and subsoils onsite will be avoided. However, in the event that stockpiling is required, stockpiled materials, pending reuse onsite, 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 onsite 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, not suitable for reuse onsite, 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 shall be identified and designated. • All stockpiles shall be assigned a stockpile number. • Material identified for reuse onsite, offsite 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. • 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 drains.

Aspect	Mitigation
	<u>Export of Resource (Soil and Subsoil) and Waste</u> All surplus materials and any waste will be removed offsite in accordance with the requirements outlined in the ORWMP (OSL, 2025c) and will be managed in accordance with all legal obligations. 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 offsite. 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/permited) 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 onsite. Waste collection permits for registered hauliers and certs of registration/ licenses/permits for authorised waste facilities will be kept on file at the 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 offsite 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. <u>Concrete Works</u> 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 (OSL, 2025b), concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorised concrete batching plant in full compliance with relevant planning and environmental consents). Concrete trucks, cement mixers or drums/bins are only permitted to wash out in designated wash out area greater than 50m from sensitive receptors including drains and drainage ditches. Excess concrete which may need to be removed from foundations/formwork during construction will be contained and removed to a designated area onsite 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. 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. <u>Handling of Fuels, Chemicals and Materials</u> Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the OCEMP (OSL, 2025b), 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 (OSL, 2025b), any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas. These areas will be located within a designated area placed furthest away from adjacent watercourses / drains and contained within constructed bunded areas (e.g., placed on 150mm concrete slab with the perimeter constructed with 225mm solid blockwork rendered internally). 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 onsite 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 onsite. Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed offsite. 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.

Aspect	Mitigation
	Emergency Procedures Emergency procedures will be developed by the appointed contractor in advance of works commencing and spillage kits will be available onsite including within vehicles operating onsite. Construction staff will be familiar with emergency procedures 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 offsite. 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 onsite 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.
Water & Hydrology	During the demolition and construction phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP) (OSL, 2025b). 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 / CEMP will be implemented for the duration of the demolition and construction phase, covering demolition, construction and waste management activities that will take place during the demolition and construction phase of the Proposed Development. Mitigation works will be adopted as part of the demolition and construction works for the Proposed Development. These measures will address the main activities of potential impact which include: - Control and Management of surface water runoff. - Control and management of shallow groundwater during excavation and dewatering. - Management and control of soil and materials. - Appropriate fuel and chemical handling, transport and storage. - Management of accidental release of contaminants at the site. - Control and handling of cementitious materials. The demolition and construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice. Good construction management practices will minimise the risk of pollution from construction activities at the subject site including but not limited to: - Construction Industry Research and Information Association (CIRIA), 2001. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors. - CIRIA, 2015. Environmental Good Practice on Site (C741). - Enterprise Ireland Oil Storage Guidelines (BPGCS005). - Environmental Protection Agency (EPA), 2013. IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities. - CIRIA, 2007. The SuDS Manual (C697). - UK Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG). - CIRIA, 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648). - Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.

Aspect	Mitigation
	<u>Control and Management of Water and Surface Runoff</u> There will be no direct discharge to groundwater or surface water during the demolition and construction phase of the Proposed Development. All run-off from the site or any areas of exposed soil will be managed as required with temporary pumping and following appropriate treatment as required. Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to onsite settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge at a controlled rate. It is noted that, where required, surface water runoff will be prevented from entering open excavations with sandbags or other approved methods proposed by the appointed contractor. The cleaning of public roads in and around the subject site will be undertaken to reduce environmental impacts and care will be taken to prevent any pollution of watercourses. The use of wheel-wash and water treatment facilities will be used as required onsite. The correct use and management of these will be undertaken by the appointed contractor to ensure that there is no harm to the receiving water environment. As documented in the OCEMP (OSL, 2025b), surface water discharge from the site will be managed and controlled for the duration of the construction works until the permanently attenuated surface water drainage system of the proposed site is complete. A temporary positive drainage system shall be installed prior to the commencement of the construction works to collect surface water runoff by the site during construction. A series of geotextile lined cascading, high level outfall, settling basins will be installed upstream of the agreed discharge point by the appointed contractor. Alternatively, a ‘siltbuster’ silt control unit can be used on the outfall. This temporary surface water management facility will throttle runoff and allow suspended solids to be settled out and removed before water is discharged in a controlled manner to the agreed outfall. All inlets to the cascading settling basins will be riprapped to prevent scour and erosion in the vicinity of the inlet. Where required, the water will also be directed through a hydrocarbon interceptor prior to discharge from the site. There will be: • Minimisation of site disturbance. • Implementation of sediment control (as outlined above). • Minimisation of the potential for erosion. • Prevention of sediment-contaminated water leaving the site. Such measures will be undertaken in accordance with the necessary discharge licenses issued by UE. Protective measures such as temporary silt fencing and berms, will be installed prior to the commencement of construction to ensure the protection of the onsite drainage ditches. A buffer zone of 10m will be maintained on either side of the onsite drainage ditches. All protective measures will be monitored to ensure that they remain functional throughout construction of the Proposed Development. Where necessary, maintenance will be carried out on the silt fencing, berms and settlement ponds to ensure that they continue to be effective. This will be particularly important after heavy rainfall events. The frequency of monitoring will depend on the stage of works, and local environmental conditions. Where dewatering of shallow groundwater is required or where surface water runoff must be pumped from the excavations, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the OCEMP (OSL, 2025b) and regulatory consents including the necessary discharge licences issued by UE to minimise the potential impact on the local groundwater flow regime of the underlying aquifer. Unauthorised discharge of water (groundwater / surface water runoff) to ground, drains or watercourses will not be permitted. Existing surface water drainage located along public roads (i.e., along Mountain Road) will be protected for the duration of the works. Where required, stockpiles of loose materials pending re-use onsite will be protected for the duration of the works and not located in areas where sediment laden runoff may enter existing surface water drains. To help shed rainwater and prevent ponding and infiltration, the sides and top of the stockpiles will be regraded to form a smooth gradient with compacted sides reducing infiltration and silt runoff. Where required, silt fences will be erected at the toe of stockpiles to prevent run-off. The silt fences will be monitored daily by the appointed contractor and silt will be removed as required. A regular review of weather forecasts of heavy rainfall will be conducted, and a contingency plan will be prepared for before and after such events to minimise any potential nuisances. As the risk of the break-out of silt laden run-off is higher during these weather conditions, no work will be carried out during such periods where possible. <u>Concrete Works</u> The use of cementitious grout used during the demolition and construction phase of the Proposed Development will avoid any contamination of the receiving hydrogeological environment through the use of appropriate design and methods implemented by the appointed contractor and in accordance with the OCEMP (OSL, 2025b) and relevant industry standards to prevent impact on groundwater and surface water quality such as the use of water compatible grout. All ready-mixed concrete will be delivered to the site by truck. Concrete batching will take place offsite, wash out of concrete trucks will take place offsite (at authorised concrete batching plant in full compliance with relevant planning and environmental consents), with the exception of cleaning the chute into a container which will then be emptied into a container located within a controlled bunded area which will then be emptied into a skip for appropriate compliant removal offsite in accordance with all relevant waste management legislation. The containers must be checked and emptied at a frequency equivalent to the volume of concrete being used and no runoff should leave the washout location. A minimum buffer of 50m will be maintained between the designated wash down area sensitive receptors including drains and drainage ditches. Any excess concrete is not to be disposed of onsite. Wet concrete works in proximity to the onsite drainage ditches will be avoided as much as practicable. Pouring of cement-based materials for works will only be carried out in dry conditions and pumped concrete will be monitored to ensure there is no accidental discharge. A suitable risk assessment for wet concreting shall be completed prior to works being carried out. Pumped concrete will be monitored to ensure there is no accidental discharge.

Aspect	Mitigation
	Handling of Fuels, Chemicals and Materials Fuelling and lubrication of equipment will be carried out in accordance with the procedures outlined in the CEMP, in a designated area of the site away from any watercourses and onsite drainage ditches (where not possible to carry out such activities onsite). Any diesel, fuel or hydraulic oils stored onsite will be stored in designated areas. These areas will be bunded (e.g. placed on 150mm concrete slab with the perimeter constructed with 225mm solid blockwork rendered internally) and located away from surface water drainage and features. Bunds will have regard to 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. The main 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. Strict supervision of contractors will be adhered to in order to ensure that all plant and equipment utilised onsite is in good working condition. Any equipment not meeting the required standard will not be permitted for use within the Proposed Development site. Only emergency breakdown maintenance will be carried out onsite. Drip trays and spill kits will be available onsite to ensure that any spills from vehicles are contained and removed off-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. There may also be the requirement for use of portable generators or similar fuel containing equipment during the demolition and 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. Emergency Procedures Emergency procedures will be developed by the appointed contractor in advance of works commencing and spillage kits will be available onsite including in vehicles operating onsite. Construction staff will be familiar with emergency procedures 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. • 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 onsite will be fully trained on the use of equipment. Infrastructure All below ground drainage infrastructure will be constructed in accordance with the measures outlined in the OCEMP (OSL, 2025b) and current UE requirements to ensure that there are no potential impacts to receiving water quality. In order to reduce the risk of defective or leaking sewers, all new sewers should be laid in accordance with the relevant standards, pressure tested, and CCTV surveyed to ascertain any possible defects. All constructed manholes will need to be securely covered, and gullies fitted with a geotextile filter to allow protection of the surface water within the pipe. 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 demolition and construction phase of the Proposed Development will either be discharged to temporary holding tank(s), the contents of which will periodically be tankered off site to a licensed facility or discharged to public sewer in accordance with the necessary temporary discharge licences issued by UE. The Ringaskiddy WWTP is operated in accordance with relevant statutory approvals issued by UE. The increase discharge to the Ringaskiddy WWTP as a result of the Proposed Development is considered to be insignificant in terms of the overall scale of the facility. The increased load does not have the capacity to alter the effluent released from the WWTP to such an extent to result in likely significant effects on its receiving waters. Therefore, there will be no potential impact at any Natura 2000 sites associated with discharges from the site.

Aspect	Mitigation
Biodiversity	<u>Biodiversity Measures</u> The CEMP (OSL, 2025a) has a number of biodiversity specific measures relating to the construction phase. The document states the following to protection to biodiversity. “All site clearance and landscaping works will comply with current legislative requirements and best practice. All retained trees that are within or close to the working wayleave of the proposed development will be protected in accordance with the requirements of British Standard BS5837:2012 Trees in Relation to Design, Demolition and Construction’ – Recommendations, with protective fencing being installed around all trees to be retained, prior to commencement of development. The planting plans and landscaping proposals will ensure that no invasive species are introduced, either deliberately or inadvertently, to the site from imported materials or other activities. Any licence necessary will be obtained if there could be a significant disturbance of any protected species.” <u>Badger Sensitive Construction Works</u> The below measures are required for all planned construction activity within 50m of the sett during the period November to June inclusive (breeding season), heavy machinery work within 30m during the non-breeding season (July – October inclusive), lighter machinery within 20m during the non-breeding season and hand digging within 10m during the non-breeding season (Figure 11.26 of Chapter 11). Licencing will be required from the National Parks and Wildlife Service (NPWS) within the above distance zones during the above-stated time periods, should there be no alternative to works proceeding at sub-optimal times/ within buffer zones. Pre-construction monitoring (No more than 10-12 months prior to construction works) 1. An inspection of the sett to check for fresh signs of occupancy. 2. Deployment of camera traps for a minimum of 2-3 weeks to confirm or otherwise that badgers are not present. 3. Soft blocking of the entrance to confirm that badgers are not present. 4. Temporary Hard Blocking / exclusion during the construction phase will then be carried out following the above measures, should badgers be confirmed to be absent from the Sett. 5. Re-opening of the disused Sett post construction. Should badgers be confirmed as present within the sett the following measures will be put in place to safeguard any individuals resting within the burrow network under NPWS licence. 1. Temporary exclusion (July to November inclusive only, outside of the breeding season). 2. Temporary Sett Closure. 3. Temporary Hard Blocking / exclusion during the construction phase. 4. Re-opening of the Sett post construction. <u>Surface Water Protection</u> Chapter 10 on Water (Enviroguide, 2025) which accompanies this application under separate cover states the following in relation to construction phase surface water mitigations “During the Construction Phase, all works will be undertaken in accordance with the Outline Construction Environmental Management Plan (OCEMP) (OSL, 2025a). These measures will address the main activities of potential impact which include: • Control and Management of surface water runoff. • Control and management of shallow groundwater during excavation and dewatering. • Management and control of soil and materials. • Appropriate fuel and chemical handling, transport and storage. • Management of accidental release of contaminants at the site. • Control and handling of cementitious materials. The construction works will be managed in accordance with all statutory obligations and regulations and with standard international best practice. Good construction management practices will minimise the risk of pollution from construction activities at the subject site including but not limited to: • Construction Industry Research and Information Association (CIRIA), 2001. Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors. • CIRIA, 2015. Environmental Good Practice on Site (C741). • Enterprise Ireland Oil Storage Guidelines (BPGCS005). • Environmental Protection Agency (EPA), 2013. IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities. • CIRIA, 2007. The SuDS Manual (C697). • UK Environment Agency, 2004. UK Pollution Prevention Guidelines (PPG). • CIRIA, 2006. Control of Water Pollution from Linear Construction Projects: Technical Guidance (C648). • Inland Fisheries Ireland (2016). Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters.”

Aspect	Mitigation
	<u>Timing of works and vegetation clearance</u> Works likely to cause disturbance to nesting birds at the eastern edge of the Site should be timed to take place outside the breeding bird season and in line with best practice i.e. during the period September – February inclusive. Any clearance of scrub on-Site should take place during the same period (February to March inclusive) in line with the strict timing of vegetation clearance stated in the Wildlife Act 1976 and subsequent amendments. All treelines currently in place should be retained and reinforced with native species. <u>Construction Phase Lighting</u> Overnight lighting will be minimised as much as possible with any essential overnight lighting directed away from natural habitats along the boundaries of the Site (i.e., the woodland, hedgerows and scrub areas interspersing the Site). Where overnight lighting cannot be avoided in these areas due to health and safety concerns, the lighting within the Proposed Development will be designed and installed to minimise the impact on local wildlife and in accordance with the Bat Conservation Trust guidelines on artificial lighting and bats (BCT 2023): • There will be no light spill to the boundary habitats. • All luminaires used will lack UV/IR elements to reduce impact. • LED luminaires will be used due to the fact that they are highly directional, lower intensity, good colour rendition and dimming capability. • A warm white spectrum (<2700 Kelvins will be used to reduce the blue light component of the LED spectrum). • Luminaires will feature peak wavelengths higher than 550nm to avoid the component of light most disturbing to bats. • Column heights should be carefully considered to minimise light spill. The shortest column height allowed should be used where possible. • Only luminaires with an upward light ratio of 0% and with good optical control will be used. • Luminaires will be mounted on the horizontal, i.e. no upward tilt. • Any external security lighting will be set on motion-sensors and short (1min) timers. • As a last resort, accessories such as baffles, hoods or louvres will be used to reduce light spill and direct it only to where it is needed. <u>Waste Management</u> As best-practice, all construction-related rubbish on-site e.g., plastic sheeting, netting etc. should be kept in a designated area on-site and kept off ground level so as to protect small fauna (such as small mammals) from entrapment and death. <u>Pre-construction Amphibian Surveys</u> Pre-construction amphibian survey will be carried out at the appropriate time of year (April/May) to identify any areas where common frog may be spawning, with particular attention paid to all drainage ditches on Site which may hold water in early spring when amphibians breed. All records will be recorded and mapped; such areas will be cordoned off prior to works during the breeding season. <u>Pre-construction Hedgerow Appraisal Surveys and Quantification</u> An appraisal of the entire Site will be carried out in relation to hedgerows following the guidance set out by the Heritage Council Best Practice Guidelines (2013). The area of hedgerow will be quantified, with the hedgerow areas planned for removal as part of the Proposed Development quantified against the planned re-planting of native hedgerow included in the Landscape Plan. The hedgerow appraisal will determine the quantity of re-planting required in order to achieve a net gain of hedgerow habitat within the overall Development Area.

Aspect	Mitigation
Noise & Vibration	A suite of noise and vibration control measures will be employed by the contractor during the construction phase in order to avoid exceedance of the adopted construction noise threshold values at the nearest NSLs. The best practice measures set out in BS 5228 (2009 +A1 2014) Parts 1 and 2 will be complied with. This includes guidance on several aspects of construction site mitigation measures, including, but not limited to: • Selection of quiet plant; • Noise control at source; • Screening, and; • Liaison with the Public Further comment is offered on these items in the following paragraphs. Noise control measures that will be considered include the selection of quiet plant, enclosures and screens around noise sources, hours of work and noise monitoring, where required. <u>Selection of Quiet Plant</u> The potential for any item of plant to result in exceedance of construction noise thresholds will be assessed prior to the item being brought onto the site. The least noisy item of plant will be selected wherever practicable (e.g., plant items with sound attenuation incorporated). Should a particular item of plant already on the site be found to exceed the construction noise thresholds, the first action will be to identify whether the item can be replaced with a quieter alternative. The appointed contractor will evaluate the choice of excavation, breaking, piling or other working methods taking into account various ground conditions and site constraints. Where alternative lower noise generating equipment are available that will provide equivalent structural / excavation results, these will be selected to control noise within the relevant thresholds, where it is practicable to do so. <u>Noise Control at Source</u> The following measures will be implemented, by the appointed contractor to control noise at source. These measures relate to specific site considerations: For mobile plant items such as dump trucks, cranes, excavators and loaders, the installation of an acoustic exhaust, utilising an acoustic canopy to replace the normal engine cover and / or maintaining enclosure panels closed during operation can reduce noise levels by up to 10 dB. Mobile plant will be switched off when not in use and not left idling. • For percussive tools such as pneumatic concrete breakers and tools a number of noise control measures include fitting a muffler or sound reducing equipment to the breaker ‘tool’ and ensuring any leaks in the air lines are sealed; • Where compressors, generators and pumps are located in proximity to NSLs and have the potential to exceed the construction noise thresholds, these will be surrounded by acoustic lagging or enclosed within acoustic enclosures providing air ventilation; and • Resonance effects in panel work or cover plates can be reduced through stiffening or the application of damping compounds, while other noise nuisance can be controlled by fixing resilient materials in between the surfaces in contact. • For all materials handling, ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials. <u>Screening</u> Screening is an effective method of reducing CNLs at a receiver location and can be used successfully as an additional measure to other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen, its mass, and its position relative to both the source and receiver. Standard construction site hoarding (2.4 m in height) with a mass per unit of surface area greater than 7 kg/m² can provide adequate sound insulation. This is recommended, as a minimum around all site boundaries of the proposed development site. Erection of localised demountable enclosures or screens will be used around particularly noisy equipment as required, when in operation in proximity to NSLs with the potential to exceed the construction noise thresholds. Annex B of BS 5228–1 (Figures B1, B2 and B3) provide typical details for temporary and mobile acoustic screens, sheds and enclosures that can be constructed on-site from standard materials. A well placed and designed mobile temporary screen around a pile, breaker or excavation can effectively reduce noise emissions by 10 dB(A). In addition, careful planning of the construction site layout will also be considered. The placement of site buildings such as offices and stores between the site and sensitive locations can provide a good level of noise screening. <u>Hours of Work</u> Working hours will be restricted to 07:00 to 18:00 Monday to Friday & 08:00 to 16:00 on Saturdays. Sunday or Bank Holiday work will only take place periodically at the agreement with Cork County Council. Similarly, any other out of hours working will be only permitted by arrangement with site management and Cork County Council. <u>Liaison with the public</u> A designated Community Liaison Officer (CLO) will be appointed to site during construction works. Any noise complaints will be logged and followed up in a prompt fashion by the CLO. In addition, prior to particularly noisy construction activity, the CLO will inform the nearest noise sensitive locations of the time and expected duration of the noisy works. <u>Monitoring</u> During the construction phase the contractor will carry out noise monitoring at representative NSLs to evaluate and inform the requirement and / or implementation of noise management measures. Noise monitoring will be conducted in accordance with ISO 1996–1 (ISO 2016) and ISO 1996–2 (ISO 2017). <u>Vibration Control</u> Vibration from construction activities will be limited to avoid any form of potential cosmetic damage to buildings and structures. Monitoring will be undertaken at sensitive buildings, where proposed works have the potential to be at or exceed the vibration limit values.

Aspect	Mitigation
Air Quality & Climate	Communications • Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager; • Display the head or regional office contact information; and • Develop and implement a Dust Management Plan (DMP), the final dust management plan will form part of the overall construction management plan which will formally be prepared and submitted to Cork County Council post grant of planning permission.
	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; • Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the Cork County Council when asked; 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 Demolition • Ensure effective water suppression is used during demolition operations. Handheld sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition, high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground; • Avoid explosive blasting, using appropriate manual or mechanical alternatives; and • Bag and remove any biological debris or damp down such material before demolition

Aspect	Mitigation
	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 bowsers and regularly cleaned; • Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable); • Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits; and • Access gates to be located at least 10 m from receptors where possible
Cultural Heritage	Licenced archaeological monitoring will be conducted within the wooded area during proposed landscaping works. For the remainder of the development site, and based on the results of archaeological testing and consultation with the County Archaeologist, licenced archaeological monitoring may be required during the construction phase. The requirement and extent of this monitoring will be determined based on the findings of archaeological testing and following discussions with the County Archaeologist.

Table 17.2 Summary of Operational Phase Mitigation

Aspect	Mitigation
Population & Human Health	The proposed development is of a high quality design that incorporates generously sized units with integrated energy efficiency measures and an abundance of open space. The impact assessment section did not identify likely significant negative environmental impacts on population and human health arising from the operational phase of the proposed development. Accordingly, mitigation measures are not proposed.
Landscape & Visual	No significant landscape or visual impacts are expected during all phases of the proposed development. The retained vegetation along with the proposed landscape and planting plans will mitigate against negative landscape and visual impacts. Therefore, no mitigation is required.
Material Assets: Traffic & Transport	A Mobility Management Plan has also been developed by MHL and is included in the Traffic and Transportation Assessment submitted as part of the planning application. This plan serves as a 'best practice' measure to accompany the application. The purpose of the Mobility Management Plan is to reduce the percentage of single-occupancy vehicle trips and address the anticipated transport impacts on the end-users of the site. These mobility measures will also support residents who may choose to live 'car-free' by providing a range of sustainable transportation options, thus eliminating the need for car ownership. The measures primarily focus on promoting walking, cycling, and public transport use and can be broadly categorized into the following groups: • Appointing a Mobility Manager. • Providing a Welcome Travel Pack for residents. • Implementing measures to encourage walking, such as clear signage and maps throughout the site. • Implementing measures to promote cycling, including bike hire hubs on site and cycling signage and maps that indicate travel times to key destinations. • Encouraging public transport use by collaborating with local bus operators to improve bus scheduling, routes, and school travel options. The development will be designed to complement and support future transport initiatives such as Carrigaline Transportation and Public Realm Enhancement Plan (TPREP) and County Development Plan policy and objective for Carrigaline and the wider area.
Material Assets: Built Services	The design and construction of the required services infrastructure in accordance with the relevant guidelines and codes of practice is likely to mitigate any potential impacts during the operational phase of the development, with the exception of any routine maintenance of the site services. Any additional mitigation measures required for the proposed built services, if required, during the operational phase will be as advised by the relevant service provider. The following mitigation measures shall be taken during the operational phase: <u>Surface Water Drainage:</u> • Inspection and maintenance of components of the system shall be performed on a regular and scheduled basis to ensure the effective functioning of the system and the mitigation of risk to the receiving environment, for both adoptable and non-adoptable parts of the system. • Implement a Surface Water Management and Maintenance Plan <u>Wastewater Drainage:</u> Wastewater drainage services not to be vested to Uisce Éireann consist of drainage systems within individual premises upstream of each Customer Connection Chamber to each premises. Wastewater drainage systems within individual premises are designed to operate without the need for maintenance. However, this depends on individual good practices. To this end, the following information and educational material will be distributed to purchasers at handover: • A guide to Managing Your Household Waste & Domestic Water Usage, produced by the Environmental Awareness & Research Unit of Cork County Council. • Think Before You Flush information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce. • Think Before You Pour information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce. • The Dirty Dozen information leaflet produced by thingbeforeyouflush.org, supported by Uisce Éireann and An Taisce. <u>Water Supply:</u> Water supply services not to be vested to Uisce Éireann consist of water supply pipework within individual premises downstream of the Customer Connection and Boundary Box to each premises. Water supply systems within individual premises are designed to operate without the need for maintenance. Each purchaser or lease holder will be informed of the location of the shutoff valve at the connection to each premises so that the user may shut off the water supply should the need arise. <u>Electrical Supply:</u> The connection to the existing network to supply the site will form part of the customer Agreement with ESB Networks. ESB Networks will take charge of their system on completion and will be responsible for the ongoing maintenance and operation of the service. <u>Telecommunications:</u> The connection to the existing network to supply the site will form part of the customer Agreement with Openeir. Openeir will take charge of their system on completion and will be responsible for the ongoing maintenance and operation of the service

Aspect	Mitigation
Material Assets: Waste	An Operational Waste Management Plan has been prepared by OSLButler Engineering Consultants (2024) for the proposed development. The OWMP details the waste segregation and storage capacity requirements, as well as the plan which will be adopted to manage the residential and commercial waste arising from the proposed development, once operational. Implementation of the OWMP will ensure a high level of recycling, reuse and recovery at the development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus contributing to the targets set out in the National Waste Management Plan for a Circular Economy (NWMPCE) 2024 -2030. The waste storage and collection strategy outlined in the OWMP will provide adequate storage capacity for the estimated quantity of segregated waste. Designated areas for waste storage will provide sufficient room for the required receptacles in accordance with the details outlined in the OWMP. The layout of the proposed development facilitates access for refuse vehicle collection of waste throughout the site. The OWMP will also include mitigation measures to ensure a high level of recycling, reuse and recovery at the proposed development. All recyclable materials will be segregated at source to reduce waste contractor costs and ensure maximum diversion of materials from landfill, thus achieving the targets set out in The National Waste Management Plan for a Circular Economy 2024-2030.
Land & Soils	There is no requirement for mitigation measures for the Operational Phase taking account of the design measures for the Proposed Development.
Water & Hydrology	There will be no risk to water quality including groundwater and surface water associated with the operational phase of the Proposed Development. It is considered that the design of the Proposed Development is in line with the objectives of the Water Framework Directive (2000/60/EC), as amended (WFD) to prevent or limit any potential impact on water quality. There will be no petroleum hydrocarbon-based fuels used during the operational phase and the main operating system for heating will be gas based / air to water heat pump, thereby removing any potential contaminant sources associated with fuels. All drainage from paved areas along roads and impermeable roads will be collected and managed within the surface water drainage and SuDS solutions as outlined in the Infrastructure Report (OSL, 2025d). The surface water management strategy includes a number of measures that will capture any potentially contaminating compounds (petroleum hydrocarbons, metals, and suspended sediments) in surface water runoff from the higher risk areas including roads and the impermeable areas that could potentially otherwise discharge to groundwater or receiving water courses in the vicinity the site. The measures incorporated in the SuDS design include Petrol Interceptors, Swales, Bioretention Raingardens, SuDS Tree Pits, Permeable Pavers, Cellular Attenuation Systems and Attenuation Basins within the drainage and SuDS system. The measures incorporated will be effective in the treatment and removal of any contaminants (metals, polycyclic aromatic hydrocarbons (PAHs) and suspended solids) entrained in surface water runoff. The effectiveness of these SuDS measures is documented in TII guidance (TII, 2014). Furthermore, prior to discharging from the site, it will pass through a class 1 petrol interceptor that will be effective in removal of hydrocarbons that may enter the drainage system in particular in the event of worst-case scenario spill incident (e.g., collision on the roadway resulting in the loss of fuel form a vehicle). Ongoing regular operational monitoring and maintenance of drainage and the SuDS measures will be incorporated into the overall management strategy for the Proposed Development. This will ensure that there are no impacts on water quality and quantity (flow regime) during the operational phase of the Proposed Development. Foul water during the operational phase of the Proposed Development will ultimately discharge via the Ringaskiddy WWTP to Cork Harbour under the appropriate consents from UE. As mentioned above, the Ringaskiddy WWTP is operated in accordance with relevant statutory approvals issued by UE. Foul water from the site will only be discharged to the UE network under the appropriate consents from UE, and therefore, the proposed development will not cause a potential impact at any Natura 2000 sites associated with discharges from the site. Accordingly, any potential impact on receiving surface water and groundwater beneath the Proposed Development site will be avoided taking account of the design proposals. Therefore, it is considered that the water quality protection criteria and objectives of the GDSDS and WFD will be achieved. There is no other requirement for mitigation measures for the operational phase of the Proposed Development.

Aspect	Mitigation
Biodiversity	<u>Badger Sensitive Screening and Landscape Design</u> Post construction or on completion of works within the predetermined buffer zone, the badger sett entrance will be re-opened, allowing for the re-use of the sett in the future and throughout the operational phase of the Proposed Development. The below measures will be put in place to avoid disturbance to the areas surrounding the Sett and to allow for free movement of badgers in the immediate area. 1. Public walkways, lighting and/ or public greenspace will be places as far as practicably possible from the sett entrance. 2. A natural screen will be put in place to form a natural barrier between the public and the sett entrance at a minimum distance of 10m. This will be carried out using appropriate, densely vegetated native hedgerow species. 3. Soil bunding will be placed at a minimum distance Of 10m radius from the sett entrance at a height of c.1-2m. <u>Surface Water Protection</u> Regular maintenance of surface water treatment facilities in accordance with best practice and manufacturers guidelines is required to keep the drainage system in adequate working order and to allow continued filtration of the surface water. <u>Landscape Management</u> Pollinators will be promoted through the management of the soft landscaping on-Site during the lifetime of the development, see landscape strategy prepared by SRLA (2025). <u>Biodiversity Enhancement Measures</u> <u>Enhancement 1: Swift Bricks</u> Although there were no observations of swift breeding onsite during surveys, it is proposed to include swift bricks or external swift boxes on the western facades of the buildings as an enhancement measure. A minimum of 15 bricks/ boxes will be incorporated across the Development and will be installed a minimum of 5m off the ground. Care will be taken to ensure no obstacles or plate glass windows are located below the bricks/boxes. Guidelines for the bird box scheme should follow guidelines published by Swift Conservation Ireland, and those published by Birdwatch Ireland entitled “Saving Swifts” (2019). The incorporation of swift bricks/boxes will help recover the declining swift population in the local area, which are now Red Listed in Ireland (Gilbert et al., 2021). Swifts are a “clean” bird species which remove their own wastes from their nests periodically. As such, swift bricks/boxes do not require any cleaning by the management company. A project ecologist will be instructed to oversee the installation of the swift bricks or boxes during the construction phase or after the development has been completed, depending on which option is decided upon by the design team. <u>Enhancement 2: Kestrel Nest Boxes</u> Kestrels have been regularly recorded in the past within the broader hinterland of the Site (NBDC, 2025). It is proposed to place two kestrel nest boxes (2 no.) in suitable areas on the edge of the Development area within retained treeline. The boxes will be placed at a minimum of 5-6m above ground and orientated towards open ground in area furthest removed from planned development. Kestrel is a Red-listed species on the Birds of Conservation Concern in Ireland (Gilbert et., al 2021). A project ecologist will be instructed to oversee the installation of the boxes after the development has been completed and the boxes will be monitored in the years post construction. <u>Enhancement 3: Bat Boxes</u> Common bat species were observed foraging on the site during the bat surveys. The wet woodland retained in the centre of the Site provides a good opportunity for bat habitat enhancement in the form of bat boxes. The boxes will provide roosting opportunities for local bat populations and help to increase the availability of suitable roost features in the area. A total of 3-5 bat boxes are recommended to be installed within the central woodland park in areas of low light and human disturbance. These boxes will be erected under supervision of the project ecologist and monitored for bat activity in the years post construction. <u>Enhancement 4: Amphibian and Reptile Hibernacula</u> It is recommended to enhance the natural areas of the Site for amphibian and reptile use by providing suitable refuge and hibernacula around the attenuation areas. It is recommended that 2-3 areas of hibernacula are provided at the attenuation areas. Hibernacula for amphibians and reptiles is relatively easy to create from rubble, wood and soil, all of which can likely be sourced from the Site during works. Rubble and wood in various sizes should be piled either in a shallow depression or on the slope of the attenuation pond in a disorganised way to create nooks and crevices. Larger tree trunks or rocks should be placed so that they will protrude through the final mound to provide open entrances to the mound. This pile should then be covered in soil to allow the inner crevices to maintain a stable temperature through the winter and allow for hibernation. The top can be planted with for example grass and native wildflowers. <u>Enhancement 3: Bee Hotels</u> Nesting boxes designed for solitary bees will be installed within suitable areas of the Site, near areas of flowering meadows or within the central woodland. Large bee or insect hotels will not be installed. Guidance from the All -Ireland Pollinator Plan states “Don’t install a large bee or insect hotel. Large bee hotels are attractive to humans, but not great for pollinators. They can encourage the spread of disease and attract predators. Avoid anything bigger than an average-sized bird box. There are many other ways to provide nesting habitats for pollinators, such as providing wild areas of undisturbed long grass, and scraping back some bare earth. If you want to make a bee hotel, make sure it is small, and position it away from bird feeders so the insects aren’t easy targets.” A link to a “How-to-guide Creating wild pollinator nesting habitat” is provided for the development management company to put these habitats in place: How-to-guide-Nesting-2018-WEB.pdf (pollinators.ie). An appointed ecologist will oversee the creation of these habitats.

Aspect	Mitigation
Noise & Vibration	Traffic Along Surrounding Road Network Changes to traffic flows will result in a not significant increase in noise level in the surrounding environment. Therefore, no mitigation measures are necessary in this case. Building Services Noise With consideration at the detailed design stage, the selection and location of plant items within the proposed development and associated buildings will ensure that noise emissions from any mechanical and electrical building services plant do not exceed the relevant noise criteria, therefore no further mitigation is required. In addition, noise emissions should be broadband in nature and should not contain any tonal or impulsive elements. Once operational noise emissions are controlled within the development site, there will be no perceptible noise impact at sensitive receivers off-site. Plaza and Creche Noise Noise related to the proposed plaza and creche will result in a not significant effect. Notwithstanding this the operation of both the creche and plaza will be limited to within the daytime hours and not cause noise nuisance that exceeds the internal noise criteria.
Air Quality & Climate	It has been determined that the Operational Phase air quality impact is negligible and therefore no site-specific mitigation measures are proposed.
Cultural Heritage	No archaeological, architectural or cultural heritage mitigation is proposed during the operational phase of the proposed development; therefore, no mitigation measures are proposed.

Table 17.3 Summary Incorporated Design Mitigation

Aspect	Mitigation
Population & Human Health	The proposed development complies with the Building Regulations which provide for the safety and welfare of people in and about buildings. The Building Regulations cover matters such as structure, fire safety, sound, ventilation, conservation of fuel and energy, and access, all of which safeguard users of the buildings and the health of occupants. The proposed design provides for the segregation of pedestrians and bicycle traffic from motorised traffic. The design also incorporates the principles of universal design and the requirements of Part M of the Building Regulations so that the development will be readily accessible to all, regardless of age, ability or disability. The integration of energy efficient measures into the design will provide for healthier living standards for future occupants, less dependence on fossil fuels and associated improved air quality. The availability of on the doorstep public open space, amenity spaces, and a highly accessible layout across the scheme will encourage sustainable modes of outdoor access for a wide age group.
Landscape & Visual	No incorporated design mitigation measures are proposed as part of the proposed development.
Material Assets: Traffic & Transport	The design incorporates dedicated cycle lanes, enhanced pedestrian crossings, and traffic calming measures in line with DMURS (2019).
Material Assets: Built Services	All new-build service infrastructure is to be designed in accordance with the relevant service provider and asset owner’s code of practice, which require due cognisance of the receiving environment. Design depths of proposed infrastructure are to be optimised so that excessive excavations are avoided where possible, and by association a reduction in resultant waste and machinery operation time. It is proposed that products and materials are supplied locally, where practicable and available, in order to reduce carbon footprint of travel and production.
Material Assets: Waste	The following measures have been incorporated into the design: - Buildings have been designed with material efficiency in mind. This involves reducing the amount of materials used in the building fabric and minimising the waste during construction; and - Opportunities to achieve on-site and off-site reuse and recycling of waste have been identified.
Land & Soils	No incorporated design mitigation measures are proposed as part of the proposed development
Water & Hydrology	No incorporated design mitigation measures are proposed as part of the proposed development
Biodiversity	Green infrastructure is incorporated into the design of the Proposed Development. The inclusion of native species will enhance biodiversity overall with provision of native shrubs, trees and sustainable surface water drainage methods including a rain garden as outlined in the landscape strategy prepared by SRLA (2025).

Aspect	Mitigation
Noise & Vibration	No incorporated design mitigation measures are proposed as part of the proposed development
Air Quality & Climate	The dwellings will be required to minimise overall energy use and to incorporate an adequate proportion of renewable energy in accordance with Building Regulations Part L 2022, Conservation of Energy and Fuel. The following points related to embodied carbon will be considered for the proposed development: • Reduce the weight of equipment. Specify products that can be demounted and reused. Specify products with long lifespans; • Mitigate refrigerant impact through low refrigerant Global Warming Potential (GWP) and leakage rates; • Plant should be easily accessible for inspection, maintenance and replacement; • Design with adaptation in mind; • Less is more, design out mechanical, electrical and pumping (MEP) where feasible; • Source local materials where possible; and • Source materials with an Environmental Product Declaration (EPD) where possible.
Cultural Heritage	Licensed archaeological testing of the proposed development site is scheduled for early 2025, pending a licence from the National Monuments Service. Should archaeological features or deposits be revealed in the course of these investigations, both the National Monuments Service and the Planning Authority will be consulted. All newly identified archaeological sites will be preserved <i>in situ</i> or by record and sufficient time and resources will be allowed to resolve all archaeological matters. Preservation <i>in situ</i> will require the relocation of the element of the development beyond the area of archaeological sensitivity. Preservation by record will require the excavation of the archaeological material and such material will be fully resolved to professional standards of archaeological practice (Policy Guidelines on Archaeological Excavation – Department of Arts, Heritage, Gaeltacht and the Islands). This work will be funded by the developer.

