Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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CHAPTER 1

Introduction

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1 Introduction

1.1 Introduction

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 environmental 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 the Environmental Impact Assessment Reports (EPA, 2022).

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

> *"Environmental Impact Assessment means a process of consisting of:*
>
> *(i) The preparation of an environmental impact assessment report by the development, 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 present 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 decision 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 describes the scope and methodology of the EIA process. The consultation process which was undertaken is outlined and the details of the environmental assessment team are also provided.

1.1.1 The Applicant

The applicant is Marina Quarter Ltd. which is a subsidiary of Glenveagh Homes.

Glenveagh are a leading Irish home builder founded in 2017, whose vision is to build homes and create sustainable communities through exemplary design. Their focus on people, homes, and communities has created successful developments nationally by understanding that well planned, well designed, and well built homes is the essence of thriving communities.

1.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Saoirse Kavanagh, Executive Planning Consultant of McCutcheon Halley Planning Consultancy. Saoirse holds a bachelor's degree in Arts (International), majoring in Geography, and a Master's in Planning and Sustainable Development. She has over 4 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the following three Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

- Cooldown Commons Strategic Housing Development, Citywest, Dublin.
- Parkside 5B Strategic Housing Development, Belmayne, Dublin.
- Clonattin Strategic Housing Development, Gorey, Co. Wexford.

1.3 Proposed Development

A detailed description of the proposed development is provided in Chapter 2. To summarise, the applicant seeks permission for the construction of 181 no. residential units at Rathgowan, Mullingar, Co. Westmeath. The development will comprise Phases 1 and 2 for a three-phase residential development and will replace the separate Phase 1 and Phase 2 applications (Westmeath County Council References: 21/97 and 21/139) which were granted by the Council and appealed to An Bord Pleanála (ABP References: 312841 and 313091).

Phase 3 was granted under the LRD process, under Westmeath County Council Reference: 22/515, and will provide 213 no. residential units and a creche. An EIAR was prepared for the Phase 3 development and submitted with the application. This permitted development is currently under construction on site.

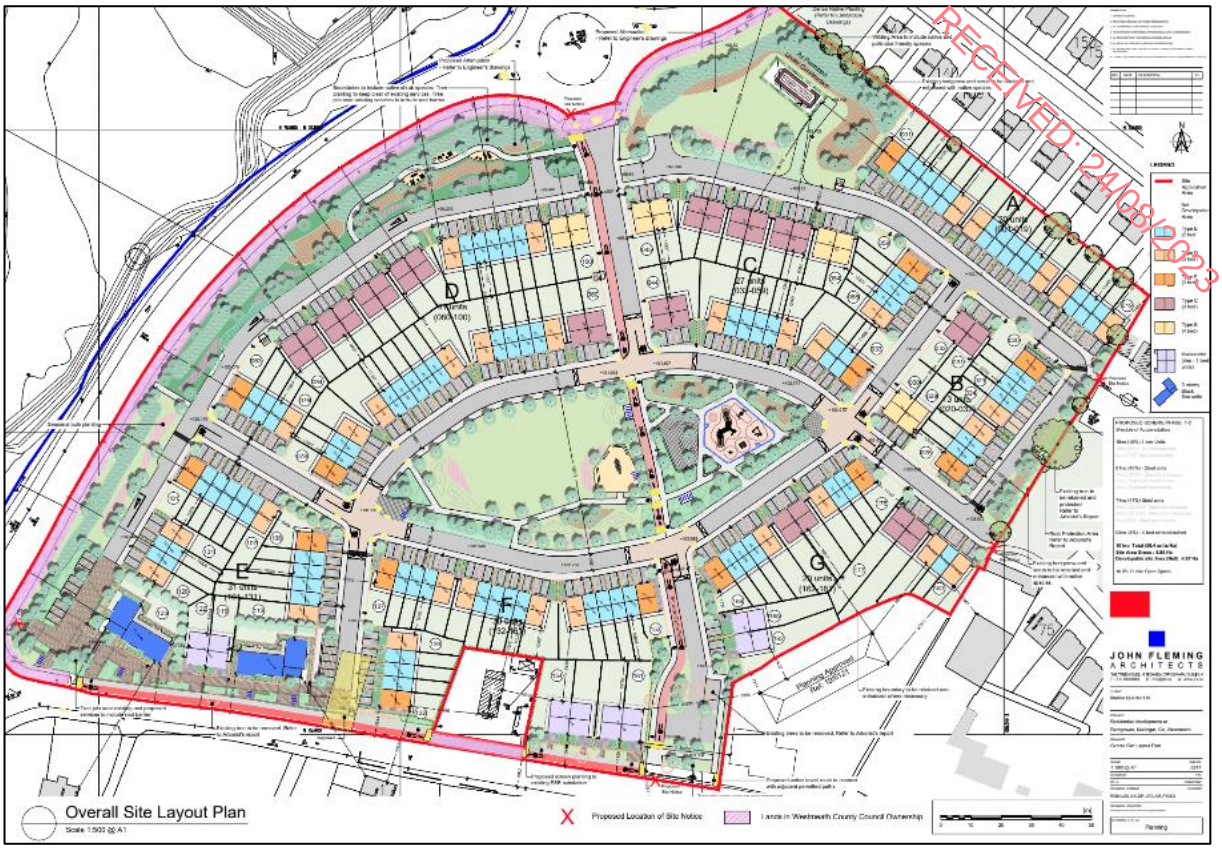

Figure 1.1 Proposed Site Layout

1.4 Methodology

This chapter has been prepared pursuant to Schedule 6 of the Planning and Development Regulations 2001 (as amended). Section 2 of the 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.

The proposed project forms part of a larger development area which is proposed to develop on a phased basis. The subject application seeks permission for development of 181 no. residential units and all ancillary development site works which will comprise of Phase 1 and 2 of a residential development on a site area of c. 5.95ha and c. 13.58ha when all 3 Phases are considered.

A previous application for Phase 3 (Westmeath Planning Reference: 22/515) was submitted to and approved by Westmeath County Council for residential development within the larger site (refer to Chapter 2 for details). The cumulative impacts of the proposed project (Phases 1 and 2) in combination with the permitted Phase 3 will therefore be considered in this EIAR.

1.4.1 Relevant Legislation & Guidelines

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

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

- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003).
- EU Environmental Impact Assessment of Projects: Guidance on the Preparation of 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).

1.4.2 Background and Purpose of the EIAR

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 (Section 10) 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 hectare 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 project comprises the construction of 181 no. residential units, on a gross site area of c. 5.95ha. Given the size and scale of the project, it does not in itself trigger the needs for an Environmental Impact Assessment and it is noted that an Environmental Impact Assessment was completed for the adjacent Phase 3 application.

However, in this case it is considered that an EIAR is required with regard to the potential cumulative impacts of the development when considered in combination with the other phase. The entire masterplan area (394 no. residential units, 3 phases in total) encompasses an area of c. 13.58ha, which exceeds the threshold for site area set out above (i.e. urban development which would involve an area greater than 10 hectares in a built up area). The Supreme Court decision in the case of Fitzpatrick v ABP (2017) IEHC 585 (known as the "Apple Data Centre case") was taken into account when determining that an EIA was required.

In cases where a project is mentioned in Part 2 but is classed as "sub-threshold development", planning authorities are required under Article 103 of the 2001 Regulations to request an EIAR where it is considered that the proposed development is likely to have significant environmental effects.

The criteria for assessing whether a development would or would not be likely to have significant effects on the environment are outlined in Schedule 7 of the 2001 Regulations and require the submission of information on the following:

- Characteristics of the proposed development
- Location of the proposed development, in terms of environmental sensitivity of geographical areas likely to be affected by the proposed development and

- Characteristics of the proposed impacts, in terms of the potential significant effects of the proposed development.

The Department of Housing, Local Government and Heritage issued Guidance for Consent Authorities regarding sub-threshold development (2020). In considering the characteristics of a proposed development, paragraphs 5.8 and 5.9 state that:

> *"One of the aims of the sub-threshold provisions contained in Irish EIA legislation is to address the issue of cumulations with other projects…Development of a large site e.g., redevelopment of an extensive brownfield site or housing development on a greenfield site, may be carried out on a phased basis, whether by one or a number of developers. The combination of individual projects may, over a period of years, have significant effects on the environment. While individual projects may not exceed mandatory EIA thresholds, the cumulative effect may be such that EIA would be appropriate in the case of some or all of the individual projects."*

1.4.3 Information Required in an EIAR

The information provided in this EIAR is based on the relevant guidelines from the EPA, the OPR, and the EU. Further guidelines have been taken into account in each EIAR chapter, as relevant.

1.4.4 Description of Impacts

The significance of the effects of the development at Rathgowan have been assessed according to the EIAR guidance and with the professional judgement of the competent experts who assisted in preparing this EIAR (the study team are presented in Table 1.3 of this EIAR). In this EIAR the terms "effects" and "impacts" are used interchangeably, unless stated otherwise.

Significance of effects is usually understood to mean the importance of the outcome of the effects (the consequences of the changes). Significance is determined by a combination of (objective) scientific and subjective (social) concerns. The significance of effects for each discipline is described using the terms provided in the 2022 EPA Guidelines documents (Table 1.1 below).

Table 1.1 Description of Effects

Quality of Effects **It is important to inform the non-specialist reader whether an effect is positive, negative or neutral.**	Positive Effect A change which improved the quality of the environment (for example, by increasing species diversity, of the improving reproductive capacity of an ecosystem, or by removing nuisances or improving amenities).
	Neutral Effect 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 environmental (for example, lessening species diversity or diminishing the reproductive capacity of an ecosystem, or damaging health or property or by causing nuisance).

Describing the Significance of Effects **"Significance" is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful (also see Determining Significance below).**	Imperceptible An effect capable of measurement but without significant consequences.
	Not significant An effect which causes noticeable changes in the character of the environment but without significant consequences.
	Slight effects An effect which caused noticeable changes in the character of the environment without affecting its sensitivities.
	Moderate effects An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends.
	Significant effects An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.
	Very significant An effect which, by its character, magnitude, duration or intensity alters most of a sensitive aspect of the environment.
	Profound effects An effect which obliterates sensitive characteristics.
Describing the Extent and Context of Effects **Context can affect the perception of significance. It is importance to establish if the effect is unique of, perhaps, commonly or increasingly experienced.**	Extent Describe the size of the area, the number of sites, and the proportion of a population affected by an effect.
	Context Describe whether the extent, duration, or frequency will conform or contrast with established(baseline) conditions (is it the biggest, longest effect ever?).
Describing the Probability of Effects **Descriptions of effects should establish how likely it is that the predicted effects will occur – so that the CA can take a view of the balance of risk over advantage when making a decision.**	Likely Effects The effects that can reasonably be expected to occur because of the planned project if all mitigation measures are properly implemented.
	Unlikely effects The effects that can reasonably be expected not to occur because of the planned project if all mitigation measures are properly implemented.

Describing the Duration and Frequency of Effects **'Duration' is a concept that can have different meanings for different topics – in the absence of specific definitions for different topics the following definitions may be useful.**	Momentary Effects Effects lasting from seconds to minutes
	Brief effects Effects lasting less than a day
	Temporary effects Effects lasting less than a year
	Short term effects Effects lasting one to seven years
	Medium term effects Effects lasting seven to fifteen years
	Long term effects Effects lasting fifteen to sixty years
	Permeant effects Effects lasting over sixty years
	Reversible effects Effects that can be undone, for example through remediation or restoration.
	Frequency of effects Describe how often the effect will occur (once, rarely, occasionally, frequently, constantly – or hourly, daily, weekly, months, annually).

1.4.5 Study Area

In general, the study area comprises the entire masterplan area (Phases 1, 2 & 3). However, the study areas are defined individually for each environmental topic, according to guidance and the geographic scope of the potential impacts and/or the information required to assess those impacts. Details are provided by each discipline as part of the description of baseline conditions of the site.

1.4.6 Scope of Cumulative Effects

Directive 2014/52/EU substituted a new Annex IV into the 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) (Environment Impact Assessment) Regulations 2018 (under the "2018 Regulations") which substituted a new Schedule 6 into the Planning and Development Regulations 2000, as amended. The Directive required that the EIAR described 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 of the differing existing and / or approved projects in the same areas as the proposed project."*

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 on 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 effect."

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

"The cumulative of effects with other existing or approved development, 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."

The proposed development forms part of a larger development area which is proposed to develop on a phased basis. To date, a separate phase 3 application has been submitted and granted by Westmeath County Council. The potential cumulative impacts of the proposed project (phases 1 and 2) in combination with the permitted phase 3 application (Westmeath County Council Reference: 22/515) will be considered in this EIAR.

In addition, the following projects have also been taken into account, where relevant, when determining potential cumulative impacts:

Table 1.2 Projects Considered for Cumulative Impacts

Proposal/Application	Link to Documents
Part 8 Housing Scheme – 22 no. units at St. Brigid's Green, Mullingar, Co. Westmeath.	The construction of 22 no. Dwelling Units Adjacent to Ashfield/Abbeylands/Green Road and St Bridget's Terrace, Mullingar, County Westmeath. | Westmeath County Council (westmeathcoco.ie)
Part 8 Housing Scheme – 17 no. units at the junction of Delvin & Robinstown Road, Springfield TD, Mullingar, County Westmeath	The construction of 17 no. dwelling units on a site at the junction of Delvin & Robinstown Road, Springfield TD, Mullingar, County Westmeath | Westmeath County Council (westmeathcoco.ie)
Part 8 Housing Scheme – 15 no. units on four sites at Ennell Court and Trinity Cottages, Mullingar, County Westmeath	To construct 15 no. single storey houses on four separate sites at Ennell Court and Trinity Cottages, Mullingar, County Westmeath. | Westmeath County Council (westmeathcoco.ie)
Part 8 Housing Scheme – 32 no. units at Friar's Mill Road/Canal Avenue, Mullingar, Co. Westmeath	Proposed Housing Development of 32 no. dwelling units consisting of 19 no. 2-bed units and 13 no. 1-bed units at Friar's Mill Road/ Canal Avenue, Mullingar, County Westmeath | Westmeath County Council (westmeathcoco.ie)

1.5 Report Structure

The EIAR has been prepared according to the 'Grouped Format Structure'. This means that each topic is considered as a separate section and is drafted by the relevant specialists.

The EIAR is divided into three volumes as follows:

- Volume 1: Non-Technical Summary
- Volume 2: Main Environmental Impact Assessment Report
- Volume 3: Appendices

Volume 1, the Non-Technical Summary (NTS), provides an overview of the project and the EIAR in non-technical terms. The summary is presented similar to the grouped format structure and discusses each environmental topic separately.

Volume 2, the main EIAR, provides the detailed information on the proposed development and the relevant environmental topics, with technical and detailed investigations of the topic areas as appropriate. This volume is prepared in the grouped format structure as it allows specialist studies to be completed for environmental topics in chapters.

Volume 3, the Appendices, contains supporting documentation and information on the EIAR.

1.6 EIAR Team

McCutcheon Halley Planning Consultants (MH Planning) are the planning consultants and project coordinators of the EIAR. The EIAR structure and consultant responsible for each of the chapters are presented in Table 1.3.

Table 1.3 EIAR Structure

Chapter	Chapter Title	Consultant
1.	Introduction	MH Planning
2.	Site Location & Project Description	MH Planning
3.	Alternatives Considered	John Fleming Architects
4.	Population & Human Health	MH Planning
5.	Land, Soils & Geology	Enviroguide Consulting
6.	Hydrology & Hydrogeology	Enviroguide Consulting
7.	Air Quality	AWN Consulting
8.	Climate	AWN Consulting
9.	Noise & Vibration	AWN Consulting
10.	Landscape & Visual Impact	Forestbird Design
11.	Material Assets – Waste	AWN Consulting
12.	Biodiversity	Enviroguide Consulting
13.	Material Assets – Traffic & Transport	Tobin Consulting Engineers

Chapter	Chapter Title	Consultant
14.	Material Assets – Site Infrastructure & Utilities	Tobin Consulting Engineers
15.	Cultural Heritage & Archaeology	John Cronin & Associates
16.	Significant Interactions of Impacts	MH Planning
17.	Summary of Mitigation Measures & Monitoring	MH Planning
18.	Screening for Major Accidents	MH Planning

The details of each consultancy within the EIAR team are provided in the table below. The qualifications of consultants responsible for each discipline is provided in the introduction to each chapter.

Table 1.4 Details of Each Consultancy

Consultancy	Address	Phone	Email
MH Planning	6 Joyce Square, Barrack House, Ballincollig, Cork.	021-4208710	info@mhplanning.ie
John Fleming Architects	The Tree House, 17 Richview Office Park, Clonskeagh, Dublin, D14 XR82.	01 6689888	info@jfa.ie
Tobin Consulting Engineers	Fairgreen House, Fairgreen Road, Galway.	094-565211	galway@tobin.ie
Enviroguide Consulting	Head Office, 3D, Core C, Block 71, The Plaza, Park West, Dublin 12.	01-5657430	info@enviroguide.ie
AWN Consulting	The Tecpro Building, Clonshaugh Business and Technology Park, Dublin 17	01-8474220	Ciara.nolan@awnconsulting.ie
John Cronin & Associates	3a, West Point Trade Centre, Ballincollig, Cork.	021-4810311	info@johncronin.ie
Forestbird Design	Cloyne Meadows, Commons West, Cloyne, Co. Cork.	085-7410232	mike@forestbirddesign.com

1.7 Scoping and Public Consultation

The EIAR was scoped following an appraisal of the 2022 EPA Guidelines on Information to be Contained within the EIAR, through design team meetings with the specialist consultants and the pre-planning meetings held with Westmeath County Council and decisions issued on previous applications on the subject site and the adjacent Phase 3 site.

Prior to lodging this application, the required information has been issued to 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.

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 received are presented in Appendix 1.1

1.8 References

Guidelines on the Information to be Contained in Environmental Impact Statements (Environmental Protection Agency (EPA), May 2022); https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf

Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003). https://www.epa.ie/publications/monitoring--assessment/assessment/advice-notes-on-current-practice-in-the-preparation-of-environmental-impact-stat.php

EU Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017). https://ec.europa.eu/environment/eia/pdf/EIA_guidance_EIA_report_final.pdf

EU Environmental Impact Assessment of Projects: guidance on Scoping (EU, 2017). https://ec.europa.eu/environment/eia/pdf/EIA_guidance_Scoping_final.pdf

Guidelines for Planning Authorities and An Bord Pleanála on carrying our Environmental Impact Assessment (OPR, 2018). https://www.opr.ie/wp-content/uploads/2019/08/2018-Environmental-Impact-Assessment-1.pdf

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CHAPTER 2

Site Location & Project Description

August 2023

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2 Site Location & Project Description

2.1 Introduction

According to the EIA Directive, an EIAR must provide a project description that includes information on the project's site, design, scale, and other relevant elements. The 2014 Directive stipulates in Recital 22 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".*

This chapter complies with the EIA Directive's criteria by giving information about the proposed project's location, size, and features.

2.1.1 Expertise & Qualifications

This chapter of the EIAR has been prepared by Saoirse Kavanagh, Executive Planning Consultant of McCutcheon Halley Planning Consultancy. Saoirse holds a bachelor's degree in Arts (International), majoring in Geography, and a Master's in Planning and Sustainable Development. She has over 4 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the following three Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

- Cooldown Commons Strategic Housing Development, Citywest, Dublin.
- Parkside 5B Strategic Housing Development, Belmayne, Dublin.
- Clonattin Strategic Housing Development, Gorey, Co. Wexford.

2.2 Methodology

The following factors have influenced the development of the proposed design:

- Guidance documents and their relevance to the proposed development;
- Analysis of the physical site context, including detailed topographical and site survey information;
- Planning history of the subject site;
- Collaboration with design team members and relevant departments of the Local Authority, with an iterative approach to design that addresses the requirements of all disciplines in a balanced manner.

2.2.1 Relevant Legislation and Guidance

The relevant guidelines to the development of the built environment in Ireland are referenced by the architect. The following documents are among them:

- National Planning Framework 2040
- Urban Development and Sustainable Residential Development in urban areas.
- Quality Housing for Sustainable Communities
- Design Manual for Urban Roads and Streets (DMURS)
- Westmeath County Council Development Plan 2021-2027
- Mullingar Local Area Plan 2014-2020 (as extended)

2.2.2 Difficulties Encountered

The subject site presented a number of design challenges which the design team has sought to resolve through our collaborative design process:

- Reaching an appropriate balance between current planning policy and density requirements while respecting the existing residential scale and context.
- Designing an appropriate drainage solution responding to both site conditions and existing limitations.

2.3 Need for the Scheme

The subject site belongs to Glenveagh Homes Ltd., and is zoned for residential development and is part of Westmeath County Council's core strategy and housing need/target for Mullingar. The site is a greenfield parcel of zoned residential land situated in a suburban location and well established residential area. The site has access to Mullingar town centre via the existing footpath network along the Ashe Road to the south.

The development of the Masterplan area will provide a high-quality residential development in keeping with the surrounding residential environment.

The development provides for cycle infrastructure, enhanced permeability throughout the site, and hard and soft landscaping and street landscaping which will provide for an attractive and sustainable residential environment.

2.4 Baseline Environment

2.4.1 Site Location

The subject site for Phase 1 and 2 measures 5.95ha, and forms part of a larger masterplan area of c. 17.9ha. The masterplan site is located within the townland of Rathgowan, within the development boundary of Mullingar, Co. Westmeath, to the northwest of the town centre.

The subject site (Phase 1 and 2) is located to the southeast of the R394 (known locally as the 'C-Link' road) and north of Ashe Road. The permitted Phase 3 site is located northwest of the R394. The location of the subject site and the permitted Phase 3 site area is shown in Figure 2.1.

The masterplan site is surrounded by medium density housing, mainly comprising two-storey residential buildings arranged around central green spaces in distinct neighbourhoods.

The lands immediately adjoining the subject site (Phase 1 and 2) to the east and south have been developed for residential units and generally comprising two-storey detached and semi-detached dwellings. The subject site is relatively flat and comprises grass with some hedgerows.

The lands immediately adjoining the Phase 3 site to the south and southwest consist of 5 no. residential dwellings as well as a now demolished detached house (c. 1910) that was identified as a protected structure (Ref. No. 15310001). The lands to the west and north of the Phase 2 site consist of agricultural land. The Phase 3 site also has a relatively level topography and comprises of grassland with some hedgerows/treeline boundaries.

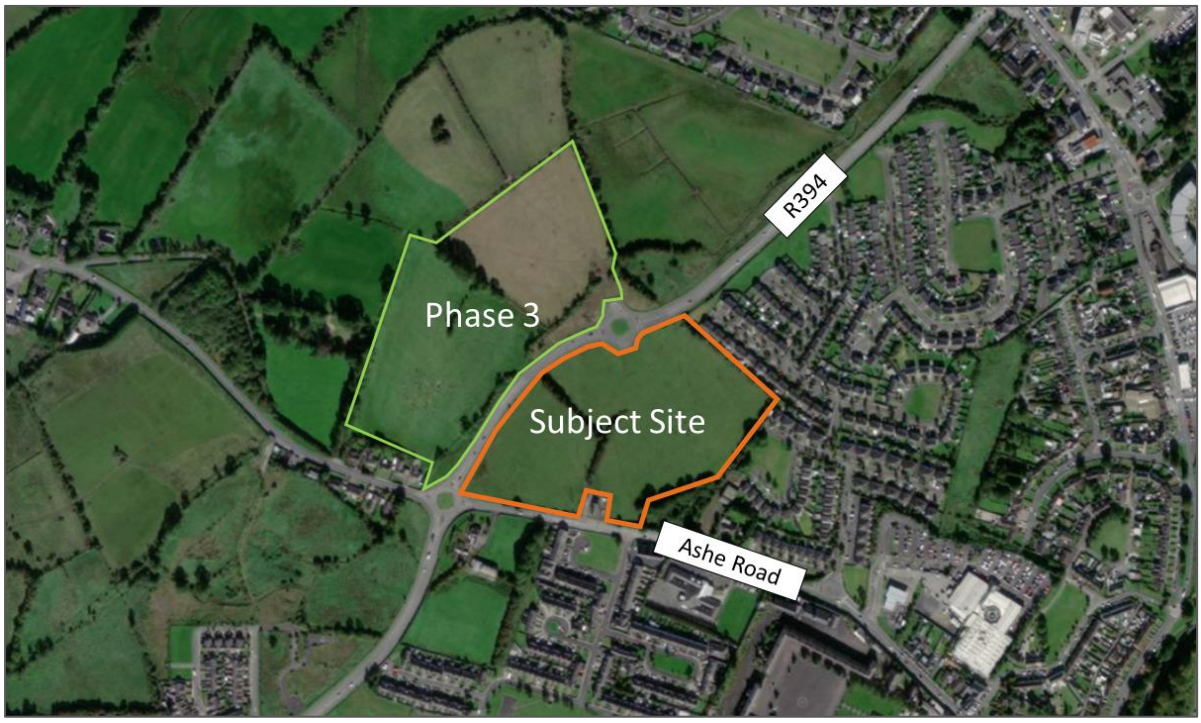

Figure 2.1 Location of Subject Site and Phase 3 Site (Map Source: Bing Maps)

2.4.2 Zoning

The subject site and the Phase 3 site are currently zoned 'proposed residential' under the Mullingar Local Area Plan 2014-2020 (as extended).

These sites are also within an Urban Design Framework Plan area. Chapter 2 of the LAP provides the following objective for this area:

> *"The objective is to create sustainable communities at this location, characterised by high quality innovative design and permeable layouts, connectivity to adjoining*

residential areas and amenities, together with the provision of social, community and recreation facilities."

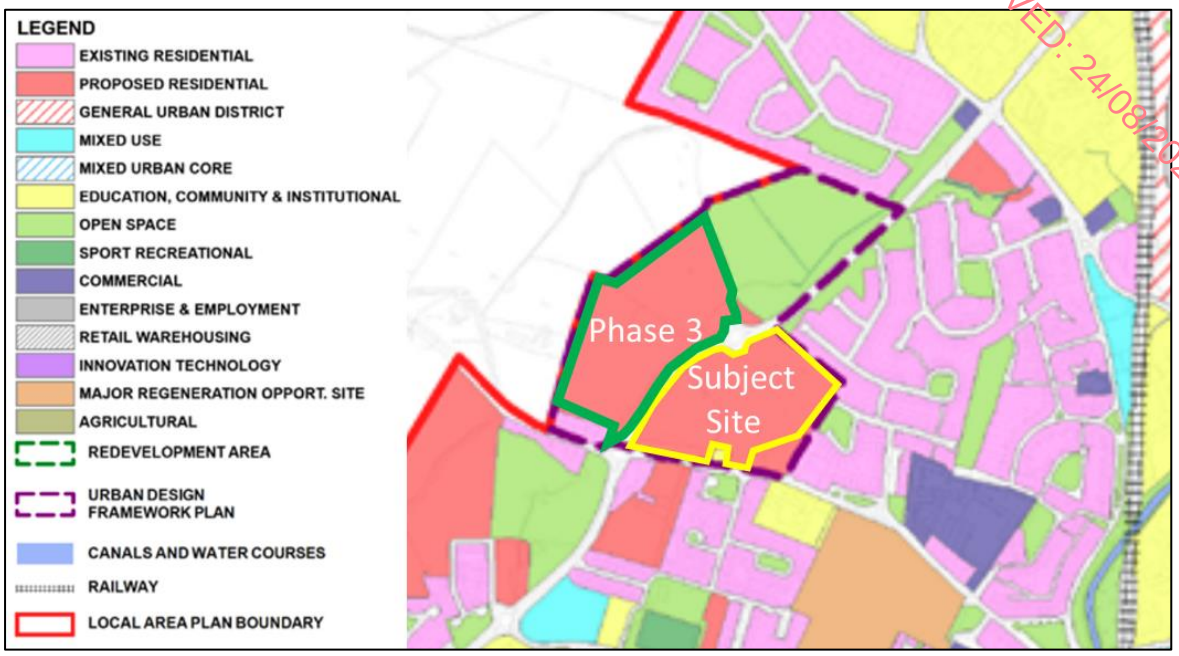

Figure 2.2 Location of subject site and phase 3 site on Mullingar LAP 2014 Zoning Map

2.5 Description of the Proposed Development

The overall masterplan (Phases 1, 2 and 3) comprises 394 no. residential units, a creche, and all ancillary development works including access, footpaths, cycle paths, car parking, bicycle parking, 1 no. pumping station, drainage, landscaping, lighting, and amenity areas. Access to the site will be via the existing entrance onto the C-Link road which traverses the masterplan area.

The current proposal (Phase 1 and 2) includes 181 no. residential units. The permitted Phase 3 includes 213 no. residential units and is currently under construction.

2.5.1 Layout

2.5.1.1 Phase 1 and 2 (Current Proposal)

Phase 1 and 2 consists of 7 cells (A to G) which provide a variety of house types. These cells are arranged around a central open space.

Cell A is located along the northern boundary and is arranged to have back gardens against the site boundary and the existing back gardens of the houses to the north.

Cell B is located south of Cell A and provides semi-detached and terraced houses.

Cells C and D are located on either side of the entrance street from the C Link. Both overlook the proposed central open space to their south.

Cell E is located within the south-western corner and includes two apartment blocks to provide a strong frontage to the C Link and Ashe Road. A plaza is provided in front of these apartment blocks.

Cell F is located along the southern boundary and wraps around the existing dwelling on Ashe Road. The maisonettes proposed in the west of this Cell have been located to continue the building line set by the existing dwelling.

Cell G has been designed in response to the permitted apartment block located to the south of the site (reference: 19/6121).

A landscaped buffer strip is provided along the western boundary to the C-Link which will act as a noise and visual buffer. This buffer strip has been designed to provide some areas of useable public open space with seating providing.

A pumping station is located in the northern corner of the site, to the east of the site access. The area around this pumping station will be landscaped to provide a high quality public open space.

A central cycle route is provided through the site in a north-south direction which will provide an alternative pedestrian and cyclist access to the Ashe Road to the south.

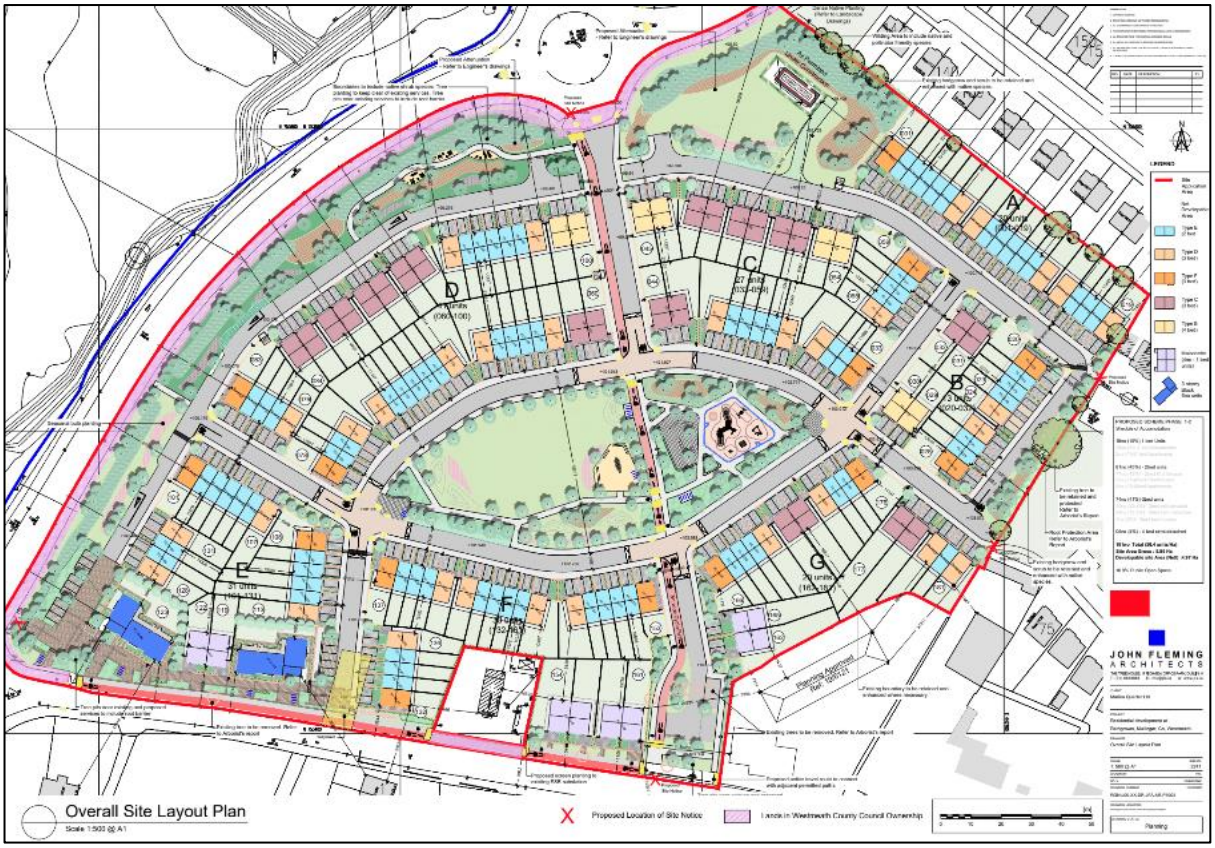

Figure 2.3 Proposed Phase 1 and 2 Site Layout

The proposed development intends to achieve a high-quality design whilst optimizing the appropriate use of the site, which will help meet increasing demand for residential accommodation while remaining sympathetic to context. The design treatment aims to achieve the highest standards in

energy efficiency, also the selected brick finishes, window selection, will complement the current building stock in the area. Materials are selected to be traditional, simple, and sympathetic to the surrounding context. The buildings feature a palette of brickwork, render, and zinc detailing. Doors and windows are a mix of timber and metal finish.

2.5.1.2 Phase 3 (Permitted)

The permitted Phase 3 layout includes a range of unit types arranged in blocks throughout the site. It includes four areas of public open spaces which are dispersed throughout the site to ensure every home has easy access to a useable open space. The permitted creche is located along the northern boundary of the site, adjacent to the vehicular access to the site. A landscaped buffer strip is provided along the eastern edge of the site, providing a buffer between the R394 and the permitted development.

Construction has commenced on this phase of development.

Figure 2.4 Extract from Permitted Phase 3 Layout

2.5.2 Unit Mix and Type

The current proposal provides a mix of 1 bed, 2 bed, 3 bed, and 4 bed residential units. The table below provides the overall unit mix breakdown in the current application, the permitted Phase 3, and the overall masterplan area.

Table 2.1 Unit Mix Breakdown

Unit Size	Phase 1 and 2 (Current Proposal)	Phase 3 (Granted)	Total
1 bed	18 no. (10%)	11 no. (5%)	29 no. (7%)
2 bed	81 no. (45%)	47 no. (22%)	128 no. (32%)
3 bed	74 no. (41%)	127 no. (60%)	201 no. (51%)
4 bed	8 no. (4%)	28 no. (13%)	36 no. (9%)

Unit Size	Phase 1 and 2 (Current Proposal)	Phase 3 (Granted)	Total
Total	181 no. (100%)	213 no. (100%)	394 no. (100%)

The current proposal and masterplan area provides a mix of apartments/maisonettes and houses, as shown in the table below.

Table 2.2 Unit Type Breakdown

Unit Type	Phase 1 and 2 (Current Proposal)	Phase 3 (Granted)	Total
Houses	155 no. (89%)	201 no. (94%)	356 no. (90%)
Apartments	26 no. (11%)	12 no. (6%)	38 no. (10%)
Total	181 no. (100%)	213 no. (100%)	394 no. (100%)

The houses and apartments/maisonettes have all been designed in line with the relevant standards and can be adapted to meet the future needs of residents.

The units will be constructed to a high standard with regard to energy efficiency. The building envelopes will avoid air leakage and have a high standard of thermal insulation, reducing energy consumption over the lifetime of the dwelling.

2.5.3 Creche

The granted Phase 3 development included a creche which was designed to cater for the entire masterplan development (i.e. all 3 phases). This permitted creche measures 429sqm and will cater for c. 97 no. children. The creche also includes a 491sqm external play area. This creche is located at the entrance to the Phase 3 site and will be easily accessible to both the permitted Phase 3 and proposed Phases 1 and 2.

The creche rooms open out onto play areas and landscaped open scape, and are designed to be bright, spacious, and connected to the natural environment. Materials used in the creche have been selected to be simple and sympathetic to the surrounding context and features a simple palette of render, stone and zinc detailing. The creche is linked to the surrounding residential neighbourhoods using dedicated cycle lanes and footpaths, to encourage walking and cycling trips and minimise car movements.

It is expected that the construction of this creche will be completed in Q1 2024, prior to the last part of (Phase 3) housing being completed, subject to an operator coming on board.

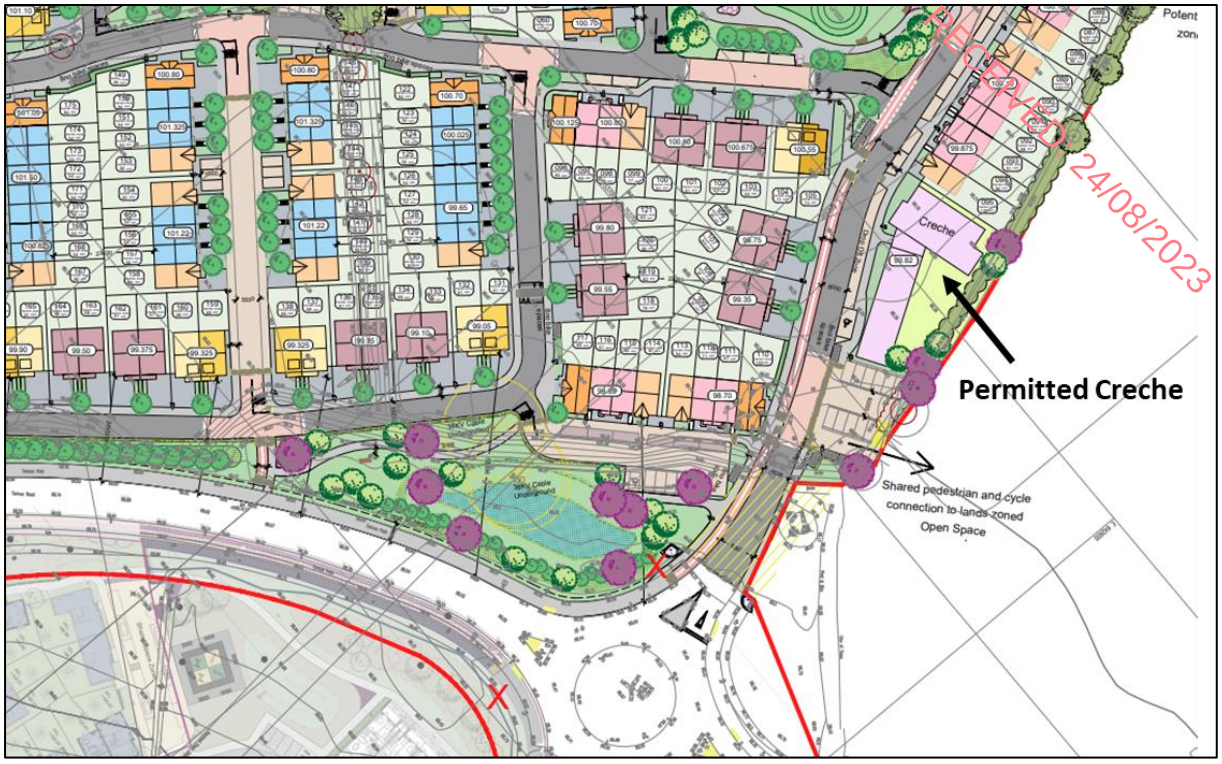

Figure 2.5 Extract from site layout submitted with Phase 3 application showing permitted creche location.

2.5.4 Open Space

The current proposal includes a total of 0.85ha (8,500sqm) public open space. This includes a large central open space which provides a kickabout area, a teen area, a playground, and seating. A separate kickabout area is provided in the north of the site, east of the site entrance, and an outdoor gym is provided to the west of the site entrance. In addition, a public plaza is provided in the south-western corner of the site, in front of the proposed apartment blocks.

The permitted Phase 3 application includes a total of 1.087ha public open space which represents 16.1% of the Phase 3 site area. Overall, the entire masterplan area provides 1.937ha (19,370sqm) public open space.

All houses and apartments in both the permitted Phase 3 development and the proposed Phases 1 and 2 are provided with private open space in line with the relevant standards.

2.5.5 Parking

The proposed Phase 1 and 2 development includes 300 no. cycle parking spaces and 265 no. car parking spaces.

Phase 3 provides a total of 661 no. cycle parking spaces (including 371 no. spaces provided via rear garden access) and 336 no. car parking spaces.

The overall masterplan area therefore will provide a total of 961 no. cycle parking spaces and 601 no. car parking spaces.

The table below provides a breakdown of the permitted and proposed cycle and car parking provision.

Table 2.3 Permitted and Proposed Cycle Parking

	Phase 1 and 2 (Current Proposal)	Phase 3 (Granted)	Total
Cycle Parking	300 no.	661 no.	961 no.
Car Parking	265 no.	336 no.	601 no.

2.5.6 Access & Infrastructure

The proposed layout seeks to create a number of different neighbourhoods with pedestrian and cycle connections between. A dedicated cycle lane runs along the central primary access roads, and this connects to the neighbourhood landscaped spaces and pedestrian and cyclist priority spaces. The permitted creche facility is located adjacent to the main entrance of Phase 3, to minimise vehicle traffic and encourage pedestrian and cycle activity.

No direct vehicular connections are provided between the proposed development and adjoining existing neighbourhoods, but pedestrian/cyclist connectivity is provided to further encourage pedestrians and cyclists. The design approach ensures passive surveillance of all pedestrian footpaths within the site which aims to stimulate connectivity between the adjoining developments.

Landscaped open spaces are designed to open and connect with adjoining open spaces, to improve permeability between new and existing neighbourhoods.

The development will have access to Mullingar town centre via existing pedestrian routes available along the Ashe Road.

There are existing power lines running along the eastern boundary of the site, this development proposes to underground the power line. There is a 10kV line running from south to north through the site that will also need to be undergrounded. There will be new substations constructed on site to cater for the new development load.

The development will be served by and connected to the pumping station already permitted as part of Phase 3.

2.6 Construction Stage

The proposed construction of the entire masterplan area is expected to take approximately four years. Access to the site will be via the existing entrances onto the C-Link Road which traverses the masterplan area.

2.6.1 Overview of the Construction Site Establishment

A temporary site compound will be set up during the construction stage of the works. A temporary site compound is currently located on the Phase 3 lands to facilitate the construction of the Phase 3. This will be relocated to the central open space within the current subject site to facilitate the construction of Phase 1 and 2.

Proposed works will include construction of a site compound, perimeter hoardings, provision of site security and access points, and erection of cranes as necessary. Safeguards will be put in place to protect the site, the works, materials and plant. Existing buildings, persons and access will be protected during the works.

2.6.2 Working Hours

The proposed construction working hours will be from 8am to 6:30pm Monday to Friday, and 8am to 1pm on Saturdays. No construction work will take place on Sundays or public holidays, except works necessary for health and safety reasons or to protect the environment. An Outline Construction Traffic Management Plan has been prepared by Tobin Consulting Engineers and is submitted with the planning application.

2.6.3 Demolition

No demolition works are proposed.

2.6.4 Earthworks

During construction of foundations, underground services and utilities, and flood attenuation tanks, site earthworks will be required. Initial topographical and utility surveys have been carried out Tobin Consulting Engineers. Further site investigations will be carried out by the contractor prior to construction. Any contaminated soils will be segregated and removed off-site in accordance with relevant waste legislation.

2.6.5 Construction Sequencing and Phasing

The masterplan area will be constructed in 3 phases. Each phase will commence with enabling works (consisting of site establishment and utility diversions where required) followed by earthworks, access, foundations, superstructure, fitting out, and landscaping works, in that order. Please refer to the accompanying Preliminary Construction Environmental Management Plan (CEMP) by Tobin Consulting Engineers in Appendix 13.2.

Phase 3, located north of the current subject site, was granted by Westmeath County Council in December 2022 and is currently under construction on site. Glenveagh Homes intends to have 50-100 homes completed and occupied by December 2023.

The current application consists of Phase 1 and Phase 2. It is intended that Phase 1 will commence following a grant of permission with Phase 2 commencing as Phase 1 is completed. Phase 1 will include a portion of the central open space to ensure the residents in Phase 1 will have a public amenity space while Phase 2 is under construction.

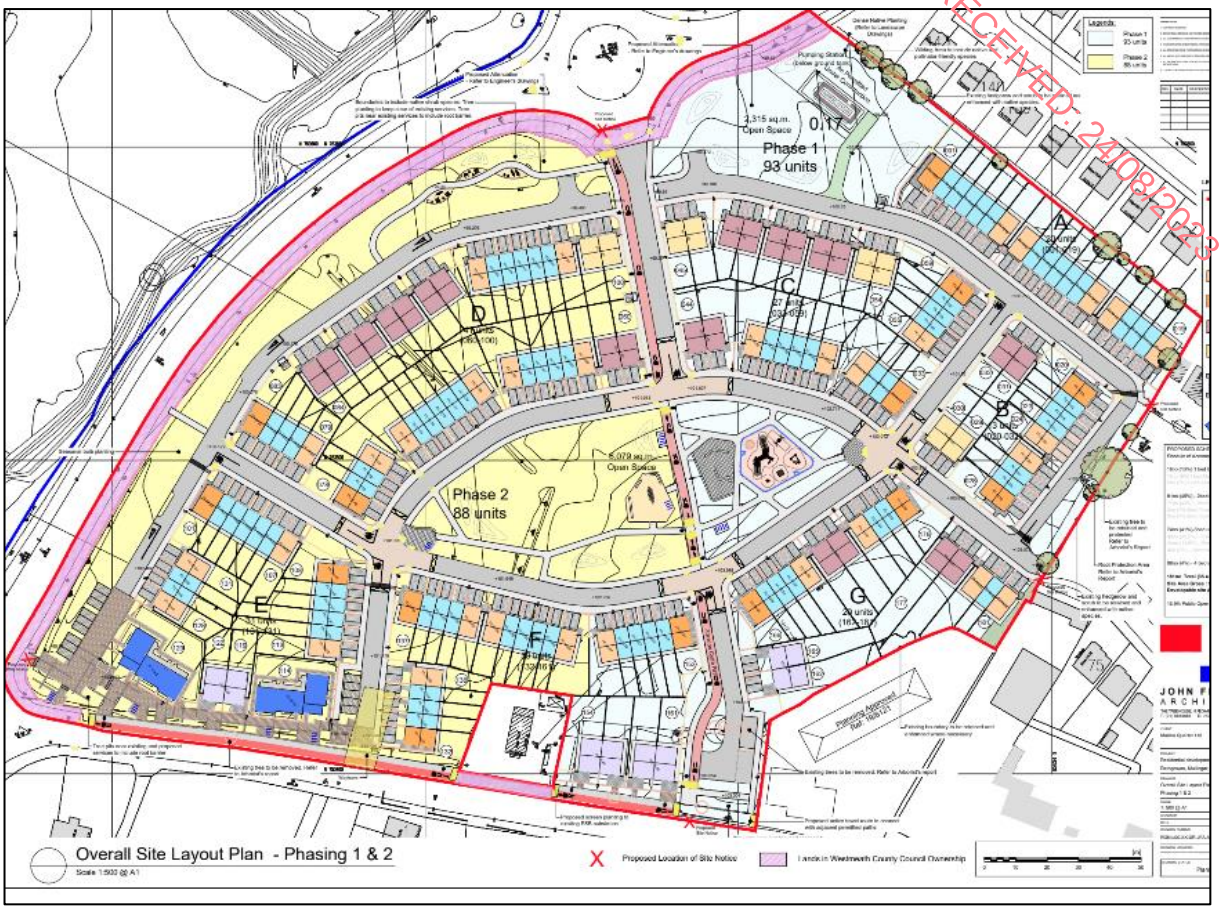

Figure 2.6 Phasing Plan

2.6.6 Traffic Management

An Outline Construction Traffic Management Plan has been completed by Tobin Consulting Engineers which notes the following:

- Due to the well-established arm in existence of the roundabout on the R394 road, it is proposed to utilise this existing entrance for vehicular access to site.
- Provision will be made onsite for a construction staff carpark within the Contractor's compound. No parking of vehicles will occur along the existing roads or neighbouring estates.
- All existing footways are to be maintained adjacent to the boundary of the site. Drop kerbs and tactile paving are present at the existing site entrance utilising the splitter Island. These facilities shall be maintained throughout the duration of the construction stage.
- During the Construction stage of the project advanced warning signs will be required on the approach to the roundabout from both directions indicating access points for Construction traffic. It is not proposed to divert cyclists from their current routes as a result of the construction phase of the development as the cyclists will be able to maintain the current arrangements along the R394 road.
- Construction activities will be undertaken during daylight hours for all construction stages. It is not anticipated that construction works will be carried out on Sunday, or Bank Holidays or that any construction works will be carried out in hours of darkness.

The contractor will be contractually required to ensure that the elements of the outline Construction Traffic Management Plan shall be incorporated into the final TMP. The contractor will also be required to promote sustainable travel to site and introduce a mobility management plan for its workforce to encourage alternative access to the site other than by car.

2.6.7 Construction Management Plan

A Preliminary Construction Environmental Management Plan has been prepared by Tobin Consulting Engineers and is included as Appendix 13.2.

2.6.8 Site Services

Refer to accompanying Preliminary Construction Environmental Management Plan prepared by Tobin Consulting Engineers. Refer also to the Material Assets Service Infrastructure and Utilities chapter of this EIAR.

2.6.9 General Principles of Operational Waste Management Strategy

Refer to accompanying Preliminary Construction Environmental Management Plan and the Construction, Demolition & Operational Waste Management Plan prepared by Tobin Consulting Engineers. Refer also to the Material Assets: Service Infrastructure & Utilities and Material Assets: Waste chapters of this EIAR.

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 3

Alternatives Considered

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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3 Alternatives Considered

3.1 Introduction

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

The EIA Directive 2014/52/EU notes that the following is required in relation to the consideration of alternatives in the preparation of the EIAR:

> *'A description of the reasonable alternatives (for example in terms of project design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects".*

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 is deciding on the selected option.

This section of the EIAR provides an explanation of the reasonable alternatives examined throughout the design and consultation process. This serves to indicate the main reasons for choosing the proposed development, taking into account and providing a comparison of the environmental effects. The alternatives may be described under the following headings.

- Alternative locations
- Alternative designs
- Alternative layouts
- Alternative processes

Alternatives may also be described at six levels: do-nothing alternative, alternative locations, alternative layouts, alternative design, alternative processes, and alternative mitigation measures.

3.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Saoirse Kavanagh, Executive Planning Consultant of McCutcheon Halley Planning Consultancy. Saoirse holds a Bachelor's Degree in Arts (International), majoring in Geography, and a Master's in Planning and Sustainable Development. She has over 4 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the following three Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

- Cooldown Commons Strategic Housing Development, Citywest, Dublin.
- Parkside 5B Strategic Housing Development, Belmayne, Dublin.
- Clonattin Strategic Housing Development, Gorey, Co. Wexford.

3.3 Proposed Development

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

3.4 Methodology

The following factors have influenced the development of the proposed design:

- Guidance documents referred to in Item 3.1.2 above, and their relevance to the proposed development.
- Analysis of the physical site context, including detailed topographical and site survey information.
- Planning history of the subject site and surrounding area.
- Collaboration with design team members and relevant departments of the Local Authority, with an iterative approach to design that addresses the requirements of all disciplines in a balanced manner.

3.4.1 Relevant Legislation & Guidance

The relevant guidelines to the development of the built environment in Ireland are referenced by the architect. The following documents are among them:

- National Planning Framework 2040
- Urban Development and Sustainable Residential Development in urban areas.
- Quality Housing for Sustainable Communities
- Westmeath County Council Development Plan
- Mullingar Local Area Plan
- Design Manual for Urban Roads and Streets (DMURS)

3.5 'Do Nothing' Scenario and Alternative Locations

The Do-Nothing Alternative would see this residential zoned site remain in agricultural use and an undeveloped greenfield site along the R394. The sustainable connectivity and modes of transportation would be less utilised if the Do- Nothing Alternative occurred. The Do- Nothing Alternative would not help Mullingar achieve its population and housing targets identified in the 2021 Westmeath County Development Plan as well as the 2014 Mullingar Local Area Plan.

The subject site belongs to Glenveagh Homes Ltd. and is zoned for residential development. It is a greenfield parcel of land situated in an area which has already been developed for residential use. The site has access to infrastructure (drainage and transport), services and Mullingar town centre via the existing footpath network along the Ashe Road to the south. When considering that the site is owned

by the applicant, the purchasing of an alternative site with residential zoning/planning permission was discounted due to the unlikely availability of such a site on the market and the levels of capital that would be required to purchase such a site. In addition, another site would not have the proximity to the R394 as well as other services and institutions in the area that would provide sustainable connectivity and community.

The development of this infill site will complete the improvement of the surrounding residential area. If the site was to remain undeveloped, it would place additional pressure on development of other zoned lands in order for Mullingar to meet its housing and population targets.

The development of the site will create new landscaped spaces and amenities overlooked by houses which will promote active use and passive surveillance in this area. It will create new landscaped spaces, play areas, and a creche which will enhance the area.

Having regard to the above alternatives, the selected location is considered the most suitable location for the proposed development.

3.6 Alternative Uses

The proposed development is located in the townland of Rathgowan within the town of Mullingar, which is identified as a Key Town in the Westmeath County Council Development Plan 2021 – 2027. The site is currently zoned within the town development boundary as 'Proposed Residential'. Westmeath County Council has highlighted the importance of providing sustainable communities through environmentally friendly transportation routes and amenity walks/cycle routes. This is displayed in the Development Plan 2021 – 2027 under objective CPO 7.6 that states:

> *"To promote the development of healthy and attractive places by ensuring:*
>
> - *Good urban design principles are integrated into the layout and design of new development.*
> - *Future development prioritises the need for people to be physically active in their daily lives and promote walking and cycling in the design of streets and public spaces.*
> - *New schools and workplaces are linked to walking and cycling networks.*
> - *The provision of open space considers different types of recreation and amenity uses with connectivity by way of safe, secure walking and cycling routes.*
> - *Developments are planned for on a multi-functional basis incorporating ecosystem services, climate change measures, Green Infrastructure and Key Landscape features in their design. "*

When the land use zoning, do-nothing scenario, and planning policies in the development plan are analysed, the proposed development would be the best option for the site. An alternative use for the

subject site would not meet the housing targets by Westmeath County Council (Please see Chapter 4 Population and Human Health Chapter) as well as the land use zoning.

Considering these objectives and targets, the proposed development has emerged as the best use option for the site.

3.7 Alternative Process

Due to the nature of the current proposal (i.e. a residential development greater than 100 dwellings), where the only option is to submit a Large-Scale Residential Development (LRD) planning application to the Planning Authority, it was not considered necessary to consider alternative processes for the proposed development.

3.8 Alternative Design/Layout

The subsections below outline the various layouts that were considered.

3.8.1 Alternative A: Previously Permitted Phase 1 and 2 Layout

Two applications were previously permitted on the subject site by Westmeath County Council – references 21/97 and 21/139. These two applications have been appealed by a third party to An Bord Pleanála and are currently awaiting a decision. The current proposed application, if permitted, will replace these schemes.

The 21/97 Phase 1 application included:

- 98 no. dwellings (24 no. apartments and 74 no. houses) comprising 8 no. 1 beds, 28 no. 2 beds, 58 no. 3 beds, and 4 no. 4 beds.
- 135 no. car parking spaces and 12 no. cycle parking spaces.
- 6,278sqm public open space
- 1 no. childcare facility.
- 1 no. pumping station.

The 21/139 Phase 2 application included:

- 83 no. dwellings (36 no. apartments and 47 no. houses) comprising 12 no. 1 beds, 20 no. 2 beds, 48 no. 3 beds, and 3 no. 4 beds.
- 112 no. car parking spaces and 66 no. cycle parking spaces
- 6,945sqm public open space.
- 1 no. pumping station.

The pumping station was included within both applications, but it was intended to provide just one pumping station on the overall site.

The layout shown in Figure 3.1 provides a combined layout of both the previously permitted Phase 1 and Phase 2 layouts. This layout combined provided 181 no. dwellings (60 no. apartments and 121 no. houses) comprising 20 no. 1 beds, 48 no. 2 beds, 106 no. 3 beds, and 7 no. 4 beds.

The open space provided in this combined layout was dispersed with limited large areas of useable open space. The main open space area coincided with overhead electricity lines, which was not ideal from a recreation and amenity perspective. The open spaces provided within the eastern portion of the site were provided as narrow strips and would not have encouraged their use for recreation or leisure. The internal street layout includes a high quantum of streets and junctions. While this would have created a permeable layout it also resulted in a car oriented scheme which would have encouraged the use of cars as a mode of transport and worked against the national objective for a modal shift to more sustainable forms of transport.

This layout included houses along the Ashe Road to the south which were provided with vehicular access and car parking off the Ashe Road. This is a less favourable arrangement.

Figure 3.1 Alternative A: Combined Layout showing Phase 1 and Phase 2 layout permitted by Westmeath County Council.

3.8.2 Alternative B: Layout Submitted with Section 247 Meeting Request

The previously permitted layout described above which were appealed to An Bord Pleanála, have provided an opportunity to create a new layout for the subject site. John Fleming Architects assessed the site constraints and opportunities and provided a Design Strategy for the scheme. This strategy included a large central open space within a cycle path through the scheme and internal streets branching off from the open space. The image shown in Figure 3.2 summarises the design strategy.

Figure 3.2 Site Assessment and Design Strategy by John Fleming Architects

Following the development of this design strategy, John Fleming Architects created a detailed site layout to submit for a Section 247 pre-planning meeting with Westmeath County Council. This layout included the following key elements:

- A large central open space with a play area and kickabout area.
- Seven cells of residential units arranged around the central open space.
- An internal street along the western boundary, parallel to the C Link Road.
- A mix of unit types including terraced houses, semi-detached houses, and maisonettes.
- A cycle path through the centre of the scheme which provides access from the roundabout to the north, through the site, to the Ashe Road to the south.
- A pumping station in the north-eastern corner of the site.

The Council provided a range of comments on this layout and requested the following changes:

- Provision of a focal building in the south-west corner of the site, at the junction of the C Link Road and the Ashe Road.
- Provision of a landscaped buffer strip along the western boundary of the site to reduce potential impact of noise from the C Link Road on the future residents of the residential units.
- Amended junctions to remove staggered junctions.
- Amended cycle path and street to demonstrate if vehicular access provided from Ashe Road.

Figure 3.3 Alternative B: Layout submitted with LRD Section 247 Meeting Request to Westmeath County Council

3.8.3 Alternative C: Layout submitted with Section 32B Meeting Request

This layout progressed from the layout submitted with the Section 247 Meeting Request and took on board the comments and feedback from the Council. The following key changes were made:

- The residential units in Cells D and E and internal street along the western boundary were set back further from the road to provide a landscaped buffer strip between the new homes and the road.
- Cell B was amended to provide a homezone along the eastern boundary and improve permeability in this section of the layout.
- The pedestrian and cycle access between Cells G and F was amended to clearly indicate that there will be no vehicular access from this point.
- The units in the south-west corner of the site have been amended to provide a strong frontage to the corner.
- The internal street layout has been amended to provide clearer and safer internal junctions. This resulted in a slight amendment to each of the cells.

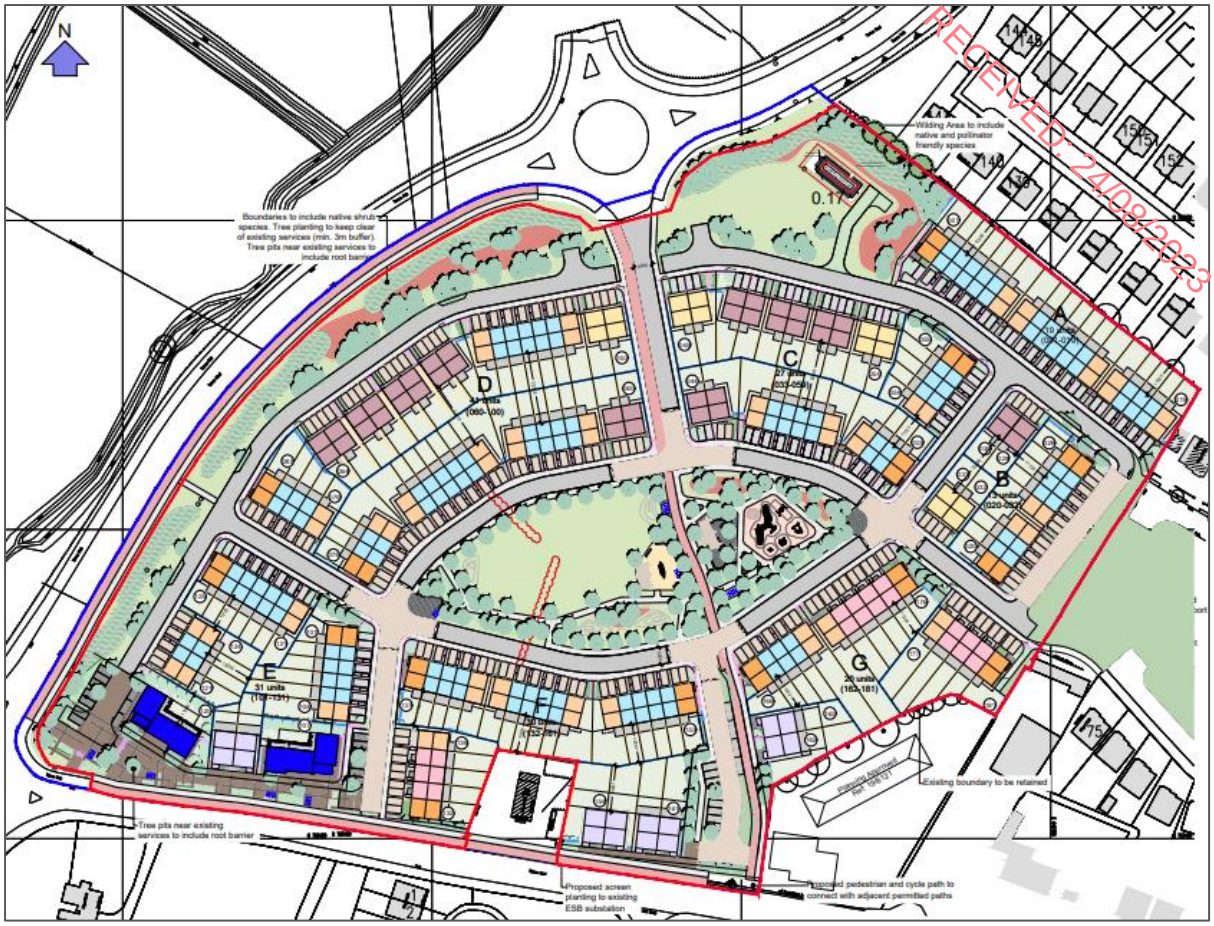

Figure 3.4 Alternative C: Layout submitted with LRD Section 32B Meeting Request

3.8.4 Alternative D: Final Layout

This layout progressed from the layout submitted with the Section 32B Meeting Request and took on board the comments and feedback from the Council. The following key changes were made:

- The cycle path through the scheme and the street between Cells G and F has been amended to provide clear and safe route for pedestrians and cyclists, and to limit the potential for accidents between cars and pedestrians or cyclists.
- The street and space in the south-western corner have been amended to provide a plaza area and to provide a more pleasant area in front of the proposed apartment blocks.
- The gardens in Cell G were amended to provide a more uniform garden sizes for all units.

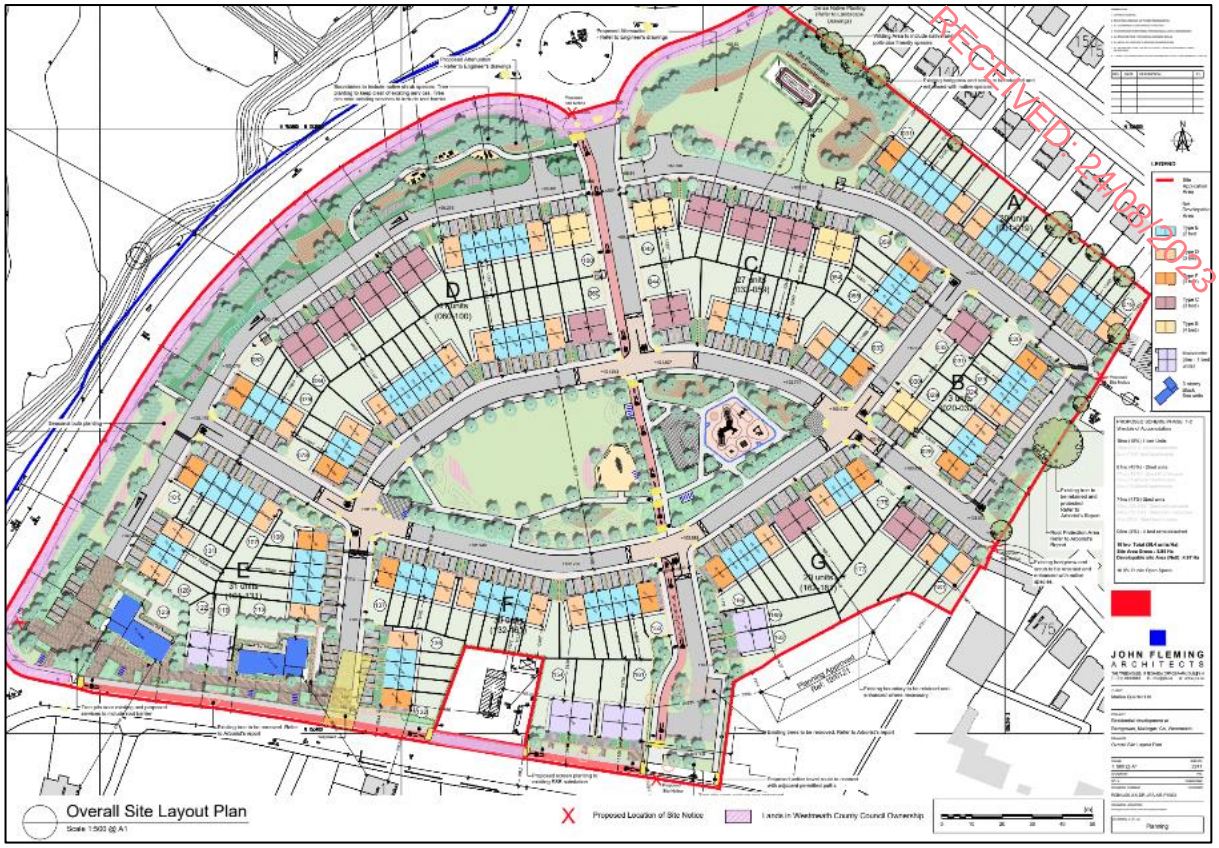

Figure 3.5 Final Layout Submitted with LRD Application

3.9 The Existence of the Project

The Construction Phase will last approximately 2 years. During the construction phase of the proposed development there will be approximately a maximum of 100 construction workers at the peak of the construction works. Hence, for the duration of the Construction Phase of the proposed development there will be a short-term increase in construction employment in the area, which will have a positive impact, both directly and indirectly, on the local economy.

The Operational Phase of the proposed development will result in an increase in the population of the area, and it will have a positive impact on the long-term supply of housing in Mullingar. In addition to housing construction, the proposed development will have the potential to create employment in the local area through the proposed childcare facilities. The provision of passive and active public open space with a mixture of recreational and amenity facilities will have a long-term, positive impact on the local human health and the socio-economic environment.

The primarily 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, Hydrology and Hydrogeology, 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.

3.10 Climate Change Preparation

The proposed scheme has been developed in consideration of future climate change impacts. All houses will feature high levels of insulation to maximise energy efficiency. The proposed layout has been developed to encourage pedestrian and cycle connectivity between neighbourhoods. The creche facilities have been located in accessible locations to reduce reliance on car trips.

Existing mature trees have been retained as far as practicable and will enhance the new neighbourhoods and landscaped open spaces. The play areas are located around existing trees to facilitate shading and create a high-quality natural environment for younger children. The proposed surface water drainage strategy has been designed to reflect future expectations relating to climate.

3.11 Conclusion

Throughout the design evolution of the subject site, the advantages and disadvantages of each early and alternative option were examined, with solutions considered in detail and the more favourable elements threaded through to the final and preferred strategy. As a result, it is our opinion that the proposed final layout and design strategy outlined in Figure 3.5 (i.e. Alternative D: Final Layout), is the most appropriate scheme with the highest quality of residential amenity and least environmental effects. The final scheme is consistent with both local and national planning policy and will create a new residential community with a strong identity, within a built-up urban environment.

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 4

Population & Human Health

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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4 Population & Human Health

4.1 Introduction

This chapter of the EIAR assesses the potential impacts of the proposed development on population and human health that are not covered elsewhere in the EIAR. It also details the proposed mitigation measures where necessary. The potential impacts on, and mitigation measures for, population and human health were assessed under the following headings: Do Nothing Scenario, Human Health (including health and safety), Population and Economic Activity, and Local Amenity.

4.2 Expertise and Qualifications

This chapter of the EIAR has been prepared by Saoirse Kavanagh, Executive Planning Consultant of McCutcheon Halley Planning Consultancy. Saoirse holds a bachelor's degree in Arts (International), majoring in Geography, and a Master's in Planning and Sustainable Development. She has over 4 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the following three Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

- Cooldown Commons Strategic Housing Development, Citywest, Dublin.
- Parkside 5B Strategic Housing Development, Belmayne, Dublin.
- Clonattin Strategic Housing Development, Gorey, Co. Wexford.

4.3 Proposed Development

A detailed description of the proposed development is provided in Chapter 2. To summarise, the applicant seeks permission for the construction of 181 no. residential units at Rathgowan, Mullingar, Co. Westmeath. The development will comprise Phases 1 and 2 for a three-phase residential development and will replace the separate Phase 1 and Phase 2 applications (Westmeath County Council References: 21/97 and 21/139) which were granted by the Council and appealed to An Bord Pleanála (ABP References: 312841 and 313091).

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."

4.4.1 Relevant Legislation and Guidance

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

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, 2022)
- Guidelines on the Information to be Contained in Environmental Impact Statements (EPA, 2002)
- Advise Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA, 2003).
- Environmental Impact Assessment of Projects Guidance on the preparation of the Environmental Impact Assessment Report (EU, 2017).

4.4.2 Study Methodology

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.

For the purposes of this assessment impacts on tourism have been scoped as the proposed project comprises a residential development in a built-up area and the site does not have any intrinsic tourism value and is not in proximity to any important tourism or amenity resources.

The appraisal of the likely significant effects of the proposed development on population and human health was conducted by reviewing the current socio-economic environment in the EIAR study area. This comprised site visits and visual assessments of the proposed site and the surrounding area, as well as an analysis of aerial photography and Ordnance Survey (OS) mapping.

Information was gathered with respect to the demographic and employment characteristics of the resident population within the relevant catchment area, sourced from the 2011 and 2016 Censuses. At the time of writing, the full 2022 census data was not available and therefore could not be used to inform this chapter. The data included information on population, structure, age profile and household size, number of persons at work, and the unemployment profile. A desktop survey of the following documents and websites also informed this:

- Westmeath County Development Plan 2021-2027
- Mullingar Local Area Plan 2014-2020 (as extended)
- Central Statistics Office (CSO) website
- Department of Education website

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.

Westmeath Childcare Committee were also consulted in relation to the existing childcare capacity in the area. Phone surveys were completed with the primary and post-primary schools in Mullingar to determine their capacity.

4.4.3 Study Area

The Study Area for the assessment of potential impacts on Population and Human Health includes 3 no. Electoral Divisions (EDs) of Mullingar Rural, Mullingar Urban North, and Mullingar Urban South.

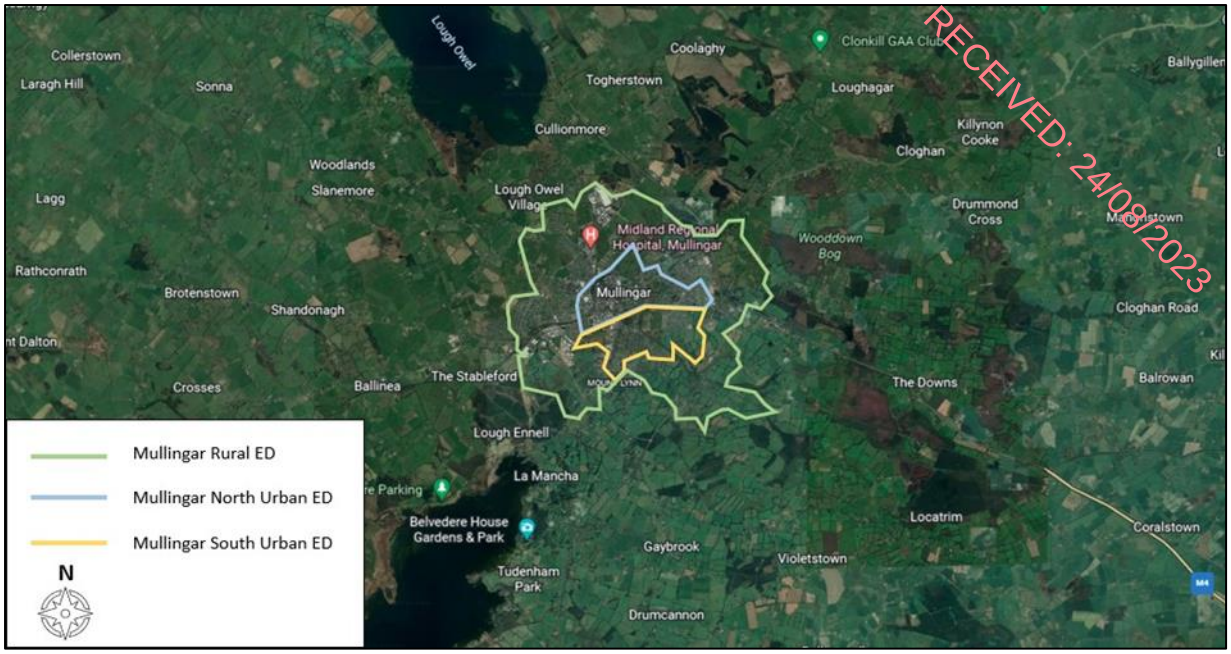

Figure 4.1 Study Area including Mullingar Rural ED, Mullingar North Urban ED, and Mullingar South Urban ED

4.4.4 Site Surveys/Investigation

The appraisal of the likely significant effects of the proposed development on population and human health was conducted by reviewing the current socio-economic environment in the EIAR study area. This comprised site visits and visual assessments of the proposed site and the surrounding area, as well as an analysis of aerial photography and Ordnance Survey (OS) mapping.

Information was gathered with respect to the demographic and employment characteristics of the resident population within the relevant catchment area, sourced from the 2011 and 2016 Census date. At the time of writing, the 2022 census data was not available. The data included information on population, age profile, household size, number of persons at work, and the unemployment profile. A desktop study of the following documents and websites was also undertaken:

- Westmeath County Development Plan 2021-2017
- Mullingar Local Area Plan 2014-2020 (as extended)
- Central Statistics Office (CSO)
- Department of Education

4.5 Difficulties Encountered

No significant difficulties were encountered in accessing information during the preparation of this chapter. However, the 2022 CSO Census Data was not available when completing this chapter. As a result, the demographic analysis has relied on the 2016 CSO Census Data.

4.6 Baseline Environment

The following provides a description of the receiving environment, with a focus on demography, land use and local amenity. The assessment of the effects on population and human health refers to those environmental topics under which human health effects may occur (e.g. noise, water quality, air quality, etc). Specific sections of this EIAR provide the baseline scenario relevant to the environmental effect being assessed.

4.6.1 Demography

Mullingar is a principal town in County Westmeath located within an hour's drive of the greater Dublin Area, Dublin Airport, and Dublin Port. This provides accessibility to city services for Mullingar residents, and further justifies the classification for Mullingar as a Key Town in the Westmeath County Council's Development Plan 2021-2027 (CDP). Under the CDP, a Key Town is classified as a:

> *Large economically active service and/or county towns that provide employment for their surrounding areas and with high-quality transport links and the capacity to act as growth drivers to compliment the Regional Growth Centres.*

As noted in the CDP, the Dublin-Sligo Railway Line serves the Mullingar. Mullingar also has access to the Galway to Dublin National Cycle Network (NCN) that is located along the existing Royal Canal greenway to Mullingar and connects to the Old Rail Trail that leads to Athlone. Further, the identification of Mullingar as a Key Town is reinstated in the Mullingar Local Area Plan 2014 – 2020 as this designation signifies the importance of ensuring accessibility through national and international connectivity, and strong business cores.

Therefore, the three Mullingar EDs provide an important contribution to County Westmeath as a whole, as it ensures a balance of development while providing sufficient infrastructure that provides connectivity and accessibility to Dublin City and the Greater Dublin Area. The Westmeath CDP notes under objective CPO 2.5 that its Core Strategy is to '*support the continued growth and sustainable development of Mullingar to act as a growth driver in the region and to fulfil its role as a Key Town in accordance with the principles and policies of the RSES'*.

4.6.2 Population

The Population and Labour Force Projection 2017 – 2051 Report released by the CSO in 2018 identifies that Ireland's population is projected to grow substantially by 2051. This growth is expected to occur from a population of 4.74 million in April 2016 to 6.69 million by 2051. Population growth will be influenced by inward migration and fertility, but even in the case of low inward migration and declining fertility, Ireland's population is still expected to reach at least 5.58 million in 2051.

The National Planning Framework (NPF) 2040 notes that the location of Westmeath and its relationship to Dublin has resulted in the county experiencing substantial growth. The NPF also notes that the Midlands is strategically important, as it's a central location in Ireland that can benefit from strategic investment that is supported by sustainable population growth, infrastructure, and economy. According to Westmeath County Development Plan 2021 – 2027, the population in

Mullingar is expected to increase by 24% between 2016 – 2027. Therefore, is its to be expected that the town will reach a total population of 26,003 by 2027.

Electoral Divisions (EDs) are the smallest legally defined administrative areas in the State for which Small Area Population Statistics (SAPS) are published from the Census. There are 3,440 legally defined EDs in the Irish State. For this assessment, statistical analysis and assessment will encompass the 3 no. of Electoral Divisions (ED) that are within Mullingar. These include Mullingar Rural ED, Mullingar North Urban ED, and Mullingar South Urban ED. The 3 Phase area is located within the ED of Mullingar Rural, however, the site is highly influenced by the demographics and trends that exist in Mullingar North and South (refer to Figure 4.1).

The Regional Spatial Economic Strategy (RSES) for the Eastern and Midland Region notes that although the Eastern and Midland Region is the smallest in terms of land area, it is the largest in population while acting as the primary economic region in Ireland. More specifically, the RSES notes Mullingar's role in providing the key employment hubs within its own hinterland. Further, the RSES notes that:

> *The provision of housing plays a fundamental role in the overall economic, social, and environmental success of the settlement. It is essential to ensure an effective supply of land for the provision of housing and that high quality development is secured in the right place at the right time. A range of well-designed housing types that meet the needs of a variety of households will help to sustain and enhance the settlement, contributing to the creation of a high-quality space.*

In The Mullingar Town Local Area Plan 2014 – 2020 identifies that there will be significant population growth in Mullingar and Westmeath as a whole. Mullingar is anticipated to experience a significant increase in population from 20,153 in 2016 to 26,003 in 2027. Therefore, the projected housing need that is expected in Mullingar in tandem with its projected population growth. According to the figures provided in the Westmeath County Development Plan 2021 – 2027, the Mullingar Town Local Area Plan 2014 – 2020, as well as the associated Census, calculations reveal that in order to cater to such rapid growth, an additional 2,974 residential units in total will be required to meet this population projection.

Table 4.1 Housing Requirement and Population Projection for Mullingar EDs

Area	2027 Population Target	Housing Requirement	New Housing Units Required	New Housing Requirements (ha)	Net Residential Area Zoned Land (ha)	Existing Household Yield
Mullingar North, South and Rural	26,003	729	4,471	193	207	1,497

4.6.3 Household Size

All of the Mullingar EDs recorded a total population of 20,928 in 2016. This is an increase of 3.8% from 2011 (i.e. 20,153 persons) and a 13% increase from 2006 (i.e. 18,416 persons). With regard to household size, an average of 2.9 was identified in Mullingar Rural ED, 2.5 in the North Urban ED, and 2.3 in the South Urban ED. When all EDs are combined, an average household size is 2.6 for all of

Mullingar Town. These figures are below both Westmeath County's average household size of 2.76 as well as the State's at 2.75. These figures reveal that the opportunity to accommodate for residential development that is allocated towards families and starter housing.

Table 4.2 Average Household Size in 2016

Area	Households	Persons	Average Household Size
Mullingar Rural ED	3,614	10,964	2.9
Mullingar North Urban ED	2,178	5,461	2.5
Mullingar South Urban ED	1,870	4,373	2.3
All 3 EDs	7,662	20,528	2.6
Westmeath County	31,813	87,887	2.76
State	1,702,289	4,676,648	2.75

It is important to note that the household figures are based on those persons who are considered as usual residents in Mullingar. This excludes visitors on census night, but the figures include people who were elsewhere in Ireland on Census Night but stated their place of usual residence is Ireland. This figure also excludes caravan and is only expressed as permanent private housing units.

4.6.4 Household Type

When considering all three Mullingar EDs, the 2016 Census found that 8.9% of the population were of preschool age (0-4) within the Mullingar Rural ED, 8.1% were in this category in the Mullingar North Urban, and 8.6% of the population in the Mullingar South Urban ED respectively. When all three EDs are amalgamated, a total of 8.6% of the population is of pre-school age. This is slightly higher than the figures identified in County-wide (7.2%) and across the State (6.9%).

The cohort identified as primary school children age is classified by ages 5-12 years, where this age group encompasses 14.0% of the Rural Electoral Division, 11.7% in the North Urban ED, as well as 7% of the South Urban ED. In total, this age group encompasses 12.8% of all 3 no. EDs in Mullingar, which is higher than the Westmeath and state average of average of 10.2% .

The post-primary age groups, ages 13-18, encompasses 9.2% of the population in the Rural ED, 7.5% in the North Urban ED, and 3.9% in the South Urban ED. In total, 7.8% of this age group are present in all 3 no. EDs. In all of Westmeath County, 7.2% of the population fall within this age group, which is slightly lower than the EDs and the state percentage of 9.2%.

There are 38.0% of adults (age 19-44) in the Rural ED and 38.7% of this age group in the North Urban ED. The percentage of residents in this age bracket for the South Urban ED are 31.8%. In total, 38.7% of the population in all 3 no. EDs are in this age bracket, which is generally consistent with Westmeath's figure at 35.0%. Further, all 3 no. EDs encompass a population percentage of 21.2% and is slightly lower than Westmeath's average of 24.2% of the county population.

The aging population, classified through age group 65+, represents 8.7% of the population in the Rural Urban ED, 12.4% of the North Urban ED, and 11.0% of the South Urban ED. Overall, about 10.2% of

the population in all 3 no. EDs are within this age cohort. This is slightly lower than Westmeath County at 12.8% as well as the state average of 13.4%.

Table 4.3 Demographic Breakdown of Age in All Mullingar EDs, Westmeath County, and the State, based on the 2016 Census.

Area	Age 0-4	Age 5-12	Age 13-18	Age 19-44	Age 45-64	Age 65+	Total
Mullingar Rural ED	966	1,514	996	4,103	2,259	945	10,783
% Total	8.9%	14.0%	9.2%	38.0%	20.9%	8.7%	100%
Mullingar North Urban ED	460	658	423	2,172	1,201	696	5,610
% Total	8.1%	11.7%	7.5%	38.7%	21.4%	12.4%	100%
Mullingar South Urban ED	381	398	220	1,787	967	489	4,422
% Total	8.6%	7.0%	3.9%	31.8%	17.2%	11.0%	100%
Westmeath County	6,464	9,123	6,445	31,152	21,526	11,370	88,770
% Total	7.2%	10.2%	7.2%	35.0%	24.2%	12.8%	100%
State	331,515	484,368	435,913	990,618	1,881,884	637,567	4,761,865
% Total	6.9%	10.2%	9.2%	20.8%	39.5%	13.4%	100%

4.6.5 Travel Trends

The demographic analysis of travel trends, as outlined in Table 4.4, indicate that the majority of people commute locally within all 3 no. EDs and other employment centres within 15 mins of the immediate area. It is noted that a total of 65.7% of the residents in all three EDs travel up to a ½ hour.

Table 4.4 Journey Time to Work, School, or College of Population Aged 5 Years and Over for all Mullingar EDs. Source: Census 2016

	Mullingar Rural		Mullingar North Urban		Mullingar South Urban	
Under 15 Min	3,040	43.2%	1,225	42.7%	1,075	42.6%
¼ hour – under ½ hour	1,520	21.6%	744	25.9%	561	22.2%
½ hour – under ¾ hour	739	10.5%	261	9.1%	266	10.5%
¾ hour – under 1 hour	327	4.64%	97	3.3%	123	4.8%
1 hour - 1 ½ hours	538	7.6%	152	5.3%	183	7.2%
1 ½ hours and over	353	5.0%	104	3.6%	124	4.9%
Not Stated	516	7.3%	282	9.8%	191	7.5%
Total	7,033	100%	2,865	100%	2,523	100%

This reveals that Mullingar provides access to sufficient services, employment, and amenities within the town, as most residents can access such amenities within a ½ hour time frame. The settlement's

position as an important residential base for workers and families within the three EDs is further reinforced when considering the level of aging population (65 years and over) is just 10.2%, which is lower than those for the County 12.8% and State (13.4%).

4.6.6 Tenure

Regarding tenure, 65.2% of residents in Mullingar Rural ED own their own home and 31.2% rent accommodation. The North ED presents a rent rate of 52.1% followed by an ownership rate of 44.1%. The Mullingar South ED has a total rent rate of 39.6% with an ownership rate of 56.6%. In reference to the table below, there is a total of 38% of rented accommodation and 58% of owner-occupied accommodation when all EDs are applied. The rented accommodation figures are above than that of the state, where 27.6% of households are renting as well as the county figures, where 26.7% of Westmeath are renting accommodation. However, the overall ED figures for owner occupied accommodation are slightly higher than that of the state (67.6%) at 68.7%.

It is noted that the table below does not account for households that are occupied free of rent and in addition, a small proportion of household did not state their tenure in the census.

This reveals that the majority of the residents in all Mullingar EDs own their home, which suggests that there are a high proportion of families buying homes within the town.

Table 4.5 Demographic Breakdown of Household Tenures. Source: Census 2016

	Total Households	Rented	Owned
Mullingar Rural ED	3,605	1063	2407
% total households	100%	29.5%	66.8%
Mullingar North Urban	2,178	1,136	961
% total households	100%	52.1%	44.1%
Mullingar South Urban	1,869	741	1,058
% total households	100%	39.6%	56.6%
Westmeath County	31,685	8,473	21,915
% total households	100%	26.7%	69.1%
State	1,697,665	469,671	1,147,522
% total households	100%	27.6%	67.6%

As referenced in the table below, the level of dwelling vacancy when all EDs are considered is 8.7% which is slightly below the county and state averages. This suggests that it is likely that residential demand is high, and that Mullingar is an attractive place to live long-term.

Table 4.6 Vacancy Levels. Source: Census 2016

	Total Permanent Dwellings	Vacant Dwellings	% Vacant Dwellings
Mullingar Rural ED	3,962	240	6.0%
Mullingar North Urban	2,507	267	10.6%
Mullingar South Urban	2,200	250	11.3%

	Total Permanent Dwellings	Vacant Dwellings	% Vacant Dwellings
Westmeath County	36,890	3,728	10.1%
State	2,003,645	183,312	9.1%

4.6.7 Economic Activity

As noted, Mullingar is located within County Westmeath and is designated as a Key Town. It is an objective within the RSES as well as the Westmeath County Development Plan 2021 – 2027 to accommodate for Mullingar's rapid population growth through residential development, as such development sustains Mullingar's role as an employment hub.

The CSO releases quarterly publications on labour force estimates for the state (Table 4.7).

The Labour Force Survey (LFS) is the official source of labour market statistics for Ireland. It includes the official rates of employment and unemployment, which are based on International Labour Organisation (ILO) Concepts and definitions.

Table 4.7 Labour force estimates. Source: Census 2016

Indicator	Q1 2023	Annual Change
Employed persons aged 15-89	2,608,500	+102,700
Employment Rate for those aged 15-64 years	73.6%	+0.8 percentage point
Unemployed person aged 15-74 years	110,700	-16,000
Unemployment Rate for those aged 15-74 years	4.1%	-0.7 percentage point
In Labour Force	2,719,100	+86,600
Not In Labour Force	1,468,300	+37,300

This table demonstrates the growth in the economy and the increasing employment levels at a national level.

4.6.8 Employment

The 2016 labour force participation figures for Westmeath County show a decline in employment and a slight increase of participation in the labour force, as can be expected due to the start of a period of economic recovery.

Table 4.8 Labour Force Participation Rate

Area	Factor	2011	2016
Westmeath County	Labour Force Participation Rate (%)	60.2%	60.8%
	Unemployment Rate (%)	19.4%	14.2%
State	Labour Force Participation Rate (%)	62.7%	61.6%
	Unemployment Rate (%)	14.8%	9.2%

According to the CSO data, the results are indicative of a growing economy that is recovery from the most recent downturn that was mainly caused by the Covid-19 pandemic.

4.6.9 Land Use and Amenity

Due to Mullingar's location within the Midlands Area, the town is close to many significant waterbodies and supports a range of diverse habitats and species. The most prominent area that is home to many of the significant flora and fauna include the Royal Canal and its canal corridors, the River Brosna, the railway corridors, and the Town Park. The River Brosna is 0.6km from the subject site and flows through Mullingar Town prior to discharging to Lough Ennell about 3.6 km south of the subject site. According to the Appropriate Assessment Screening Report by Enviroguide, Lough Ennel was assigned Water Framework Directive (WFD) status of 'Good' and the waterbody is deemed to be not at risk. The same status is classified for The Royal Canal Main line. It is important to note that there are various trees that are under a Tree Preservation Order. Due to Mullingar's presence along the Royal Canal in the study area, the Canal is located within 1.6 km from the subject site.

It is important to note that the proposed development site is not located within any European Site and there is no direct loss of habitat due to the development of the proposed scheme. Further, the site is not used by species that are listed as a Special Conservation Interests for the relevant Special Protection Area (SPA). Further, there are no Natural Heritage Areas (NHAs) are within or near the proposed development site, however, the nearest Proposed NHA (pNHA) is the Royal Canal. The proposed development does not create any impact on this pNHA. In total, there are 6 no. Special Areas of Conservation (SACs), 5 no. SPAs, 6 no. pNHAs and one NHA located within the 'precautionary zone of influence' of the proposed site. Based on the Ecological Impact Assessment conducted by Enviroguide, it is probable that the proposed development will not have a significant effect on any European sites.

4.7 Characteristics of the Proposed Development

The proposed development site is located within the townland of Rathgowan within the development boundary of the town of Mullingar. The site is located to the northwest of the town centre. It is located south of the R394 which connects to the N4 to the north and N52 to the south. The site is accessible via the existing entrance of the roundabout on the R394 which is located at the southwest corner of the site.

The proposed development consists of Phase 1 and 2 of a larger masterplan area. Phase 3 was permitted under the LRD process to the northwest of the site (reference: 22/515). The proposed application (phase 1 and 2) will provide 181 no. residential units. The permitted phase 3 development provides an additional 213 no. residential units and a creche. Overall, the masterplan area will provide a total of 394 no. residential units. The creche permitted in phase 3 was designed to cater for the overall masterplan area.

A full detailed description is provided in Chapter 2.

The area has a number of local services located within proximity of the site including schools, creches and medical facilities. A number of convenience stores are also located within a 5-kilometre radius of the site.

The proposed development will function as a natural extension to the town by consolidating development in the area and ensuring the retention of a compact settlement.

4.8 Identification of Principal Potential Receptors

In identifying potential impacts and receptors, consideration was given to the proposed residential scheme and the identified receiving environment. The principal potential receptors that will be affected by the development proposals have been identified in the following sections.

- Residential Areas in Proximity
- Community Facilities and Services, including schools and creches.
- Local Amenity
- Economic Activities

4.8.1 Residential Areas in Proximity

There are several existing residents surrounding the proposed site which have the potential to be impacted by the development, specifically the residents of:

- Existing Ashfield estate to north and east of the subject site.
- Raithín estate to south
- 12 no. existing dwellings to west of site, along R393.
- Existing dwelling to south of site, accessed off Ashe Road.

4.8.2 Community Facilities and Services

Mullingar has an abundance of community facilities and services within the town centre which are identified as potential receptors. Such services include pharmacies, post offices, dentists, banks, gyms, sport playing pitches, a community centre, as well as a selection of local convenience/comparison retail stores.

With regard to childcare facilities, a total number of 22 childcare facilities were identified within a 10-minute (drive) time of the EIAR study area. The closest childcare facilities to the proposed development includes Precious Angels Pre-School (277m south of the proposed development) and the Grange Community Childcare (553km east of the proposed development). A neighbourhood creche was permitted as part of the Phase 3 development to the northwest of the subject site.

It is important to note that the travel times and distance were determined based on the distance and average journey times from Google Maps.

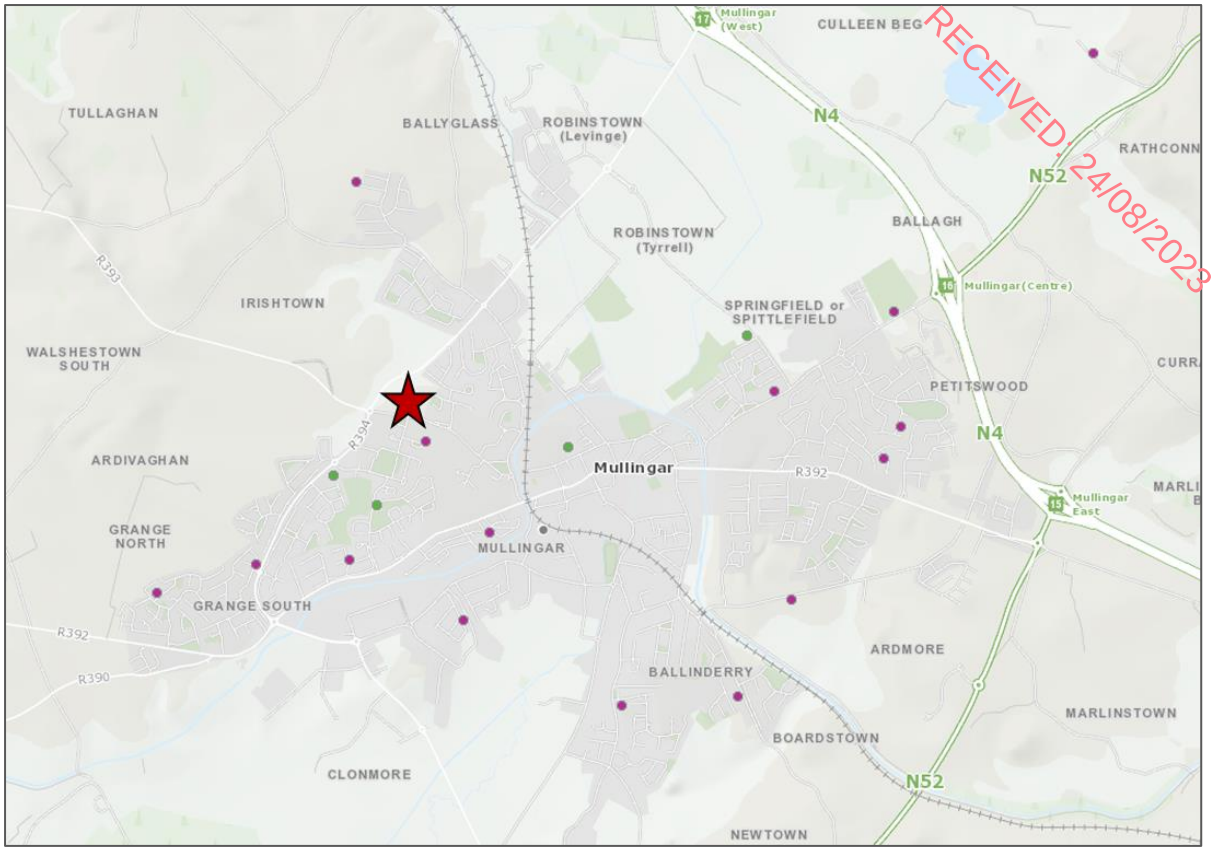

Figure 4.2 Location of Childcare Facilities in relation to Subject Site (indicated by red star).

Table 4.9 List of Childcare Facilities within 5km of the Subject Site.

No.	Childcare Facility	Distance	Walk	Cycle	Drive
1.	Precious Angels Pre-School (Marian Corbett & Valja McCabe Pre-School)	277m	4 min	2min	1min
2.	Grange Community Childcare	553m	13min	4min	4min
3.	Westmeath Community Development Ltd. (WCDL) Mullingar Afterschool – Rathgowan After School	582m	7min	2min	1min
4.	Réalta Beaga Childcare CLG	662m	11min	3min	4min
5.	Grovelands Childcare	913m	16min	5min	4min
6.	Women's Community Projects Associations	986m	21min	6min	4min
7.	Sunny Days Playschool	1km	17min	5min	4min
8.	Valecro EYS Limited (Step-by-Step)	1.25km	27min	8min	4min
9.	Green Park Montessori	1.3km	18min	5min	3min
10.	Scribbles & Giggles	1.32km	25min	7min	5min
11.	An Gairdin Scoil Montessori	1.8km	27min	7min	5min

No.	Childcare Facility	Distance	Walk	Cycle	Drive
12.	Dalton Community House (Laughs and Giggles Childcare)	2km	31min	8min	5min
13.	Sonas Montessori	2.15km	32min	9min	6min
14.	Belvedere Hills Nursery & Montessori	2.2km	34min	10min	6min
15.	Mullingar Montessori and Afterschool	2.55km	46min	14min	8min
16.	Mullingar Academy of Childcare and Education	2.62km	39min	11min	7min
17.	First Class Montessori	2.8km	40min	13min	9min
18.	Annie Apples	2.88km	50min	15min	7min
19.	Naionra An Muileann gCearr	2.93km	44min	12min	7min
20.	Bright Beginnings	4.46km	1hr26min	23min	9min

Mullingar is served by 11 no. primary schools, 4 no. post primary schools, and 2 no. special schools. All the primary schools are within 4km of the subject site, with 5 no. within 1km of the site. 3 no. primary schools are within a 11-minute walk from the site. All 4-no. post primary schools are located within 1.6km, and a 25minute walk, from the subject site. The two special schools – St. Brigid's Special School and Saplings Special School – are both within a 25minute walk from the subject site. The location of these schools is shown in Figure 4.3.

Figure 4.3 Locations of Schools within Mullingar

The following tables provide enrolment details for each school and outline the distance of each school from the subject site.

Table 4.10 List of Primary Schools in Mullingar

No	School Name	Distance	2021-2022 Enrolment	2022-2023 Enrolment
1.	Gaelscoil an Mhuilinn	114m	221	212
2.	Mullingar Educate Together	500m	393	391
3.	Scoil na mBraithre (St. Mary's)	775m	418	432
4.	Presentation Senior/Junior School	999m	290	274
5.	Scoil na Maighdine Mhuire	1km	324	321
6.	Rochfortbridge Convent Primary School	1.3km	228	233
7.	All Saints National School	1.3km	86	85
8.	Gaelscoil An Choillin	1.7km	87	102
9.	St. Coleman's National School	2km	471	467
10.	St. Kenny National School	3,2km	231	227
11.	Holy Family Primary School	2.9km	400	435

Table 4.11 Distance of Primary Schools from Subject Site

School Name	Distance			
	Km	Walk	Cycle	Drive
Gaelscoil an Mhuilinn	114m	2min	1min	1min
Mullingar Educate Together	500m	6min	2min	1min
Scoil na mBraithre (St. Mary's)	775m	11min	3min	5min
Presentation Senior/Junior School	999m	19min	6min	4min
Scoil na Maighdine Mhuire	1km	19min	6min	4min
Rochfortbridge Convent Primary School	1.3km	19min	6min	6min
All Saints National School	1.3km	19min	6min	6min
Gaelscoil An Choillin	1.7km	26min	8min	6min
St. Coleman's National School	2km	30min	9min	6min
St. Kenny National School	3,2km	45min	11min	5min
Holy Family Primary School	2.9km	48min	14min	9min

Table 4.12 List of Post Primary Schools in Mullingar

No	School Name	Distance	2021-2022 Enrolment	2022-2023 Enrolment
1.	Loreto College	750m	876	858
2.	Coláiste Mhuire	770m	794	837
3.	St. Finian's College	1km	839	838
4.	Mullingar Community College	1.6km	309	333

Table 4.13 Distance of Post Primary Schools from Subject Site

School Name	Distance			
	Km	Walk	Cycle	Drive
Loreto College	750m	19min	5min	3min
Coláiste Mhuire	770m	12min	3min	5min
St. Finian's College	1km	18min	5min	3min
Mullingar Community College	1.6km	25min	7min	7min

Table 4.14 List of Special Schools in Mullingar

No	School Name	Distance	2021-2022 Enrolment	2022-2023 Enrolment
1.	St Brigid's Special School	893m	83	83
2.	Saplings Special School	1.6km	36	36

Table 4.15 Distance of Special Schools from Subject Site

School Name	Distance			
	Km	Walk	Cycle	Drive
St Brigid's Special School	893m	21min	6min	4min
Saplings Special School	1.6km	24min	7min	6min

4.8.3 Local Amenity

Mullingar benefits from a strong network of community groups, clubs, and societies. The development is considered and designed to improve and protect the existing residential amenities by providing a series of open space play areas and a neighbourhood creche. Mullingar's town centre is distinctive, as it encompasses a strong town character with a unique setting, history, and community spirit as noted in the Westmeath County Development Plan 2021 - 2027. There is a total of 56 no. protected structures and 319 no. are recorded on the National Inventory of Architectural Heritage (NIAH) within or in close proximity to Mullingar, as the town contains a number of archaeological monuments that obtain historical significance. There are no protected structures or national monuments located on

the subject site. The proposed development will not have any impact on any national monuments or protected structures.

There are various recreational facilities and public realm interventions that occur mainly within Mullingar Town, approximately 2 km from the subject site. This includes the Táin Trail and the Westmeath Way within the town. It is an objective of the Mullingar Local Area Plan to enhance connectivity in the town in a sustainable manner, which is reflected in the proposed cycleway/walkway trail in the scheme. Mullingar also has a series of parks and sporting facilities such as Cusack Park, greyhound Track, as well as St. Loman's GAA grounds.

4.8.4 Economic Activities

Owners and employees of other commercial activities may be impacted by the proposed development i.e. local business owners, industries, and adjacent farms. Consideration is given under economic activity to the potential impact on other neighbouring commercial activities.

It is important to note that an increase of tourism is not expected from the proposed development and does not hinder on any existing tourism areas such as The Old Rail Trail Greenway and the Belvedere House Gardens and Park.

4.8.5 Temporary Receptors

In relation to temporary receptors, the proposed development is adjacent to the R394 and Ashe Road. Due to the topography of the EIAR study area and the surrounding land uses, there will be minimal natural screening of the proposed development while under construction. However, it is expected that there will be a neutral impact on passing drivers in terms of safety and accessibility. Potential impacts are thoroughly assessed in Chapter 9 Landscape and Visual Impact Assessment.

4.9 The 'Do Nothing' Scenario

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 as 'Proposed Residential' within the Mullingar Local Area Plan 2014-2020 (as extended). Due to the nature of the proposed development, the consideration of alternative sites is not necessary. The consideration of an alternative site would equate to a 'do-nothing' scenario, which in turn means the site will not be developed in accordance with its allocated zoning.

Both the Westmeath County Development Plan and the Mullingar Local Area Plan note the importance of prioritising town growth in a sustainable manner, where it is an objective in both plans to promote sustainable connectivity and modes of transportation. Therefore, the provision of additional housing within the town boundary will support compact growth and sustainable transport. If the 'do nothing scenario' is applied and the development is not implemented, there will be a lack of sustainable connections within the northwest of Mullingar Town, where residents will depend on a car to access the amenities, institutions, and services in the immediate area.

4.10 Potential Significant Effects

4.10.1 Construction Phase

General construction activities and excavations may give rise to emissions to air or surface water and may generate noise and vibration. The details of the construction phase of the project are provided in in the Preliminary Construction and Environmental Management Plan (CEMP) by Tobins Consulting Engineers (Appendix 13.2). To summarise, the development will be constructed and expected to be completed within 24 months in duration with each phase taking 18 months to complete. As this is as estimation, the construction of both phases is expected to overlap to be completed within the 2 year period.

Phase 3 of the development consists of the construction of 213 no. residential units, 1 no. neighbourhood creche and all associated ancillary development. Phases 1 and 2 will comprise 181 no. residential units and all ancillary development works.

The construction of the permitted Phase 3 development has commenced and is expected to be completed by Q4 2024. It is intended to begin construction of Phase 1 and Phase 2 in Q3 2024, assuming receipt of a final grant in Q1 2024. The expected hours of construction works will commence from 8:00 am to 18:00 from Monday to Friday (excluding bank holidays), and from 8:00 to 14:00 on Saturdays. For more information, please refer to the Preliminary Construction Environmental Management Plan prepared by Tobin Consulting Engineers.

4.10.1.1 Population and Settlement Pattern

The construction of this project will be short term and is not likely to result in any significant changes to the population and settlement patterns. Generally, 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. No significant impacts are anticipated as a result of the construction phase of the development. The construction phase of the project is estimated to take 24 months and is not likely to result in any changes to the population and settlement patterns.

4.10.1.2 Economic Activity

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 final phase of the development is completed by 2025. Approximately 5 - 100 workers will be employed on site for up to 2 years, and there will be indirect benefits to other industries as a result of demand for construction materials and services. The loss of the agricultural lands is anticipated to have a neutral effect as the lands were under the ownership of the applicant who is a residential developer and not engaged in farming.

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

4.10.1.3 Land Use and Amenity

The project is in accordance with the statutory zoning objective. There will be no severance of lands or loss of rights of way as a result of the proposed development. In general, the construction phase impacts on local amenity and receptors identified in proximity will be mainly related to noise, air quality and traffic. These are dealt with in the relevant chapters of this EIAR.

Potential impacts will mainly relate to noise from construction plant to traffic and perception of visual changes associated with the removal of trees and hedgerows and emerging plant and machinery.

Potential impacts from construction traffic are considered in Chapter 12 Material Assets: Traffic and Transport. An Outline Construction Traffic Management Plan (OCTMP) has been prepared by Tobin Consulting Engineers and will be implemented to avoid negative impacts by restricting the majority of HGV movements to local roads at off peak times and implement delivery of materials on site to avoid peak traffic periods. Please see the OCTMP and CEMP by Tobin Consulting Engineers for more information.

It is expected that the construction schedule is likely to have a maximum of 20 HGV movements into and leaving the site per day on average. It is estimate that 35 – 50 site operatives will be employed during construction works, increasing to 75-130 per day as construction nears completion. Please refer to Chapter 12 Material Assets Traffic and Transport for further details.

If the permitted Phase 3 development is occupied while the proposed phases 1 and 2 are under construction there may be short term impacts as a result of construction traffic, however given that development of the site will be on-going for approximately 2 years before the final phase is complete, residents can be expected to become somewhat habituated to background levels of traffic and disturbance. In general, the impact of construction traffic is assessed as moderate negative, but short term.

The assessment of potential impacts of noise and vibration is presented in Chapter 9. No impacts from vibration are anticipated. In general, the noise impact associated with the construction phase is to be temporary only and will be limited to agreed construction hours and limited beyond these hours as far as possible. The assessment identified that during construction the chief source of noise emissions will be from plant used onsite. Overall, the impacts from the Phase 1 and 2 construction phase will be slight to moderate, localized, and short term in duration.

4.10.1.4 Health

As with any construction site, there will be potential risks to the 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. Proposed mitigation measures are outlined in the preliminary Construction and Environmental Management Plan, and in Chapter 9 Noise and Vibration to manage construction activities and traffic movements as well as limiting noise and disturbance.

Chapter 7 Air Quality identified that the greatest potential impact on air quality during the construction phase is from construction dust emissions and the potential nuisance dust, with potential for significant dust soiling 15m from the source. A number of mitigation measures are proposed and

following implementation of these measures potential significant impacts are unlikely and any effects will be negative, short-term and imperceptible with respect to human health.

The site will be made secure, and the public will be separated from the site by means of fencing and hoarding. All site facilities will be contained within the site area. The main entrance gate will be controlled by site personnel (gateman) for deliveries. Site Lighting and Camera security system may be used to secure the site in and out of hour times, and any proposed site lighting will be set up with consideration for adjoining properties.

A temporary construction compound will be established for each phase of the development and situated and secured to ensure safety of the public and construction workers.

Following implementation of these measures the construction phase of the project adverse effects will be unlikely, neutral, and short term.

4.10.2 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.

The assessment of potential impacts of the fully built out Masterplan area (which assumes all 3 phases are built and occupied) are assessed in Section 4.10.3 Cumulative Impacts.

4.10.2.1 Population and Settlement Pattern

The proposed development is in line with the statutory land use zoning and will provide 181 no. residential units. The overall masterplan area (current proposal and the permitted phase 3 development) will provide a total of 394 no. residential units and a creche.

Based on the national average household size of 2.75 persons, the masterplan area will provide a population of c. 1,084 no. people. The demographic analysis demonstrates that 8.9% of the local area's population were aged 0-4, 12.8% were of primary school age, and 9.2% were of post primary school age in the 2016 census. Based on this, the proposed masterplan area is expected to provide c. 97 no. children aged 0-4, 139 no. primary school aged children, and 100 no. post primary school aged children.

4.10.2.2 Economic Activity

There will be an economic benefit to local business during operation. 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 Mullingar, and will have a positive, slight, long-term impact on the services including dentist clinics, pharmacies, banks, and various retail outlets.

4.10.2.3 Land Use and Amenity

The proposed development is in line with the specific site-zoning objective for residential development (refer to Chapter 2 on the Project Description) and will consist principally of residential units and open space amenities for both the development and the wider community. This development will facilitate an appropriate, sustainable settlement pattern which will accommodate

residential, community, leisure and recreational facilities to satisfactorily match the anticipated level of population growth and household generation.

Community facilities identified the Social Infrastructure Audit Report prepared by McCutcheon Halley Planning Consultants are expected to benefit from the increased population in particular clubs and community centres, gyms as well as local services. Any potential impacts are anticipated to be long term, neutral and not significant.

4.10.2.4 Health

The baseline data for Mullingar indicates the at the general population is in good 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 both the current and future residents of the local environ will benefit from the proposed amenities.

The operational phase of the proposed development, in terms of recreation and amenity facilities will have a long term, moderate positive impact on the health and wellbeing of future residents and residents in the surrounding area who may make use of amenity spaces.

The development has been designed to incorporate the principles of Universal Design, to provide appropriate choice of accommodation to residents with diverse abilities and ages. A Design Statement has been prepared by John Fleming Architects which provides insight into the design concept. Overall, the design of the site can be accessed, understood, and used by the widest possible extent of people, regardless of their age, size, or ability. This includes all house types as well as the external spaces, pedestrian and cycle routes, as well as internal roadways within the site.

Potential impacts on population and human health as a result of the operational noise and vibration are assessed in Chapter 9.

4.10.2.5 Daylight and Sunlight Assessment

A Daylight, Sunlight, and Overshadowing Report has been prepared and submitted with this application which concludes that the proposed residential development achieves the best practice guidelines in relation to daylight, sunlight, and overshadowing.

4.10.2.6 Risk of Major Accidents and Disasters

The potential major risks and disasters as a result of the proposed development has been assessed and the findings are presented in Chapter 18 of this EIAR and by other disciplines within this EIAR. No risk of major accidents and disasters has been identified.

The proposed development comprises the construction of terraced and semi-detached houses, maisonettes, and apartments in a greenfield area at the northwest corner of Mullingar town. There are no sites in proximity which are subject to The Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015. A desktop study of the flood history at the Site was carried out in the Civil Engineering documents prepared by Tobin Consulting Engineers. According to the Office of Public Works (OPW), the proposed development site is not located in any Flood Zones and has not experienced any past flooding events. The Flood Risk Assessment conducted by Tobin Consulting Engineers has determined that there is a minimal risk to flooding on the site. It is important

to note that the Justification Test does not need to be applied as the Flood Risk Assessment concluded that there is no imperative risk to flooding and is appropriately located in Flood Zone C. For further information, please refer to Chapter 2: Description of Alternatives, Chapter 14: Biodiversity, as well as Chapter 6: Hydrology and Hydrogeology.

4.10.3 Cumulative Impact

4.10.3.1 Construction

Overall, the construction phase for the entire site is anticipated to be 2 years. The phasing sequence is presented in the CEMP prepared by Tobin Consulting Engineers. Cumulative impacts such as visual impact/amenity, noise, traffic and air quality are anticipated cumulative impacts. However, it is important to note that this will be temporary and will only occur over the course of construction.

4.10.3.1.1 Population and Settlement Patters

Generally, the potential impacts arising during the construction phase relate 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.

4.10.3.1.2 Economic Activity

A key positive characteristic of the development of the Masterplan (Phases 1-3) area relates to its potential economic impact. The construction phases will generate increased employment and capital spend on materials and services, which will benefit the local economy. In addition to direct employment, there will be substantial off-site employment and economic activity associated with the supply of construction materials and the provision of services such as professional firms supplying financial, architectural, engineering, legal and a range of other professional services to the project.

The impact of the construction phase will at least extend to the county in terms of the requirement for labour, goods and services. The effect will be significant, positive and short-term.

4.10.3.1.3 Land Use and Amenity

There are few permitted and proposed development in the vicinity of the EIAR study area which are in combination with the proposed development that may have cumulative impacts. The cumulative impacts related to the following projects have been considered where relevant, in the context of the human environment.

Table 4.16 Permitted and Proposed Development in Vicinity

Reference	Application Description	Comment
22/515 (Phase 3)	Permission for a Large-Scale Residential Development comprising of the construction of 213 no. residential units, 1 no. creche, 1 no. pumping station and all associated ancillary development works including 2 no. ESB sub-stations, footpaths, cycle lane, car and bicycle parking, drainage, bin storage, landscaping/amenity areas and the undergrounding of existing 38KV overhead electricity lines at Rathgowan, Mullingar, Co. Westmeath. Access will be via the existing roundabout on the R394 (C-Link). This development will form Phase 3 of a larger (three-phase) residential development at this location. A Natura Impact Statement (NIS) and Environmental Impact Assessment Report (EIAR) has been submitted to the planning authority with the application.	Westmeath County Council granted permission in December 2022 and a final grant was issued on the 19th January 2023 subject to 26 no. conditions.
20/6350	Permission for the development of a new car park 120 no. spaces to serve the HSE and Primary Care Centre at Harbour Road/Martins Lane, Robinstown (Tyrell), Mullingar, Co. Westmeath, a site of 0.623 hectares. The proposed development proposed the use of the extended access road permitted under WCC ref no. 17/6068 and LA (M)76 (Part 8) with an amended and deflected run to access the proposed car park across Martins Lane. The proposed development will comprise of the construction of a new access road and barrier-controlled car park with pedestrian links to the developed Primary Care Centre (reg. ref. 11/5040 and 17/6270) complementary soft and hard landscaping treatments, boundary treatments and all ancillary site services and above and below ground works.	After an amendment under ref. no. 22/10, Westmeath Co. Council granted permission with 8 no. conditions on 10th May 2022.
19/6121	Permission for the construction of 18 Apartment units in 2 Blocks (Block A&B). The proposed development will also consist of new site entrance, shared access road, footpaths, car parking spaces, boundary wall and fence, covered cycle rack, recycling bin storage area, public and private open spaces, partial removal and trimming of existing hedgerows to accommodate proposed site entrance, landscaping and all associated site works and services.	Westmeath Co. Council granted permission with 19 no. conditions on 22nd January 2020.

4.10.3.1.4 Health

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.

The proposed development is predominantly residential in character, and it is considered that the greatest health and safety risks will be posed during the construction phase of the proposed development.

The construction activities will occur in the context of a greenfield site, and there are no existing residents on-site that may be disrupted by these works. A CEMP has been prepared by Tobins Consulting Engineers and includes measures to mitigate impact on the wider residential amenities of the area (see Appendix 13.2)

As with any construction site, there will be potential risks to the 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. The CEMP has been prepared by Tobins Consulting Engineers (Appendix 13.2) includes measures to minimise these risks. This plan will be further updated by the contractor and agreed with the Council prior to commencement of any construction works on site.

Potential impacts on Air Quality are assessed in Chapter 7, which identified that the greatest potential impact on air quality during the construction phase of the proposed development is likely to occur as a result of construction dust emissions and the potential for nuisance dust and PM10/PM2.5 emissions. Overall, the assessment of potential impacts found that there any impacts to air quality during the construction phase are likely to be imperceptible, negative and short-term.

Mitigation measures are proposed to further reduce the possibility of impacts. A dust management plan has been prepared according to best practice guidance, to ensure that no significant nuisance occurs at nearby sensitive receptors. Please refer to Chapter 7 Air Quality.

There is the potential for a number of greenhouse gas emissions to the atmosphere during the construction of the development. Construction vehicles, generators etc., may give rise to CO_2 and N_2O emissions, however the impact on climate is considered to be imperceptible, neutral and short term.

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development with mitigation measures in place is likely to be short-term, negative and imperceptible with respect to human health.

4.10.3.2 Operational

4.10.3.2.1 Population and Settlement Patters

Measures to avoid negative impacts on population and settlement patterns have been fully considered in the design of the project and are integrated into the final layout and design. Compliance with the layout and design will be a condition of the permitted development. As such, no mitigation measures are required as there is no expected change in settlement patterns outside of the development that will occur. The operational stage recognises that there will be an increase of population as a result of all three phases of the development. However, the nature of the phasing plan will ensure that the increase is gradual in order for residents in close proximity and in the surrounding

area of Mullingar can adjust to an increase of population change. Further, the phasing implementation will allow for the local planning authority to meet its housing targets and population objectives as noted in the Westmeath County Development Plan 2021-2027 in a gradual manner also.

4.10.3.2.2 Creche

The 2001 Childcare Facilities Guidelines recommend the provision of 20 no. childcare spaces for every 75 no. residential units. Based on this standard, the 394 no. residential units within the overall masterplan area would require 105 no. childcare spaces. However, it is noted that the one bed units are unlikely to require childcare spaces. There are 29 no. 1 bed units provided throughout the masterplan area and when these are excluded the remaining 365 no. units would require 97 no. childcare spaces.

Based on the demographic analysis, the overall masterplan area is expected to generate 97 no. children aged 0-4 (8.9% of the projected population). However, it is noted that only 19% of children are likely to require private childcare which suggests that only 19 no. children within the proposed development will require private childcare.

The permitted creche within Phase 3 can cater for 97 no. children and is therefore considered sufficient for the entire masterplan area.

4.10.3.2.3 Schools

The proposed development will result in a demand for school places at both primary and post-primary level which will accrue over the proposed 5-year delivery time. The overall masterplan area will provide 394 no. residential units, constructed in 3 phases. Based on an average household size of 2.75 it is estimated that the development will accommodate c.1,084 residents.

In 2020 the Department of Education and Skills published a report detailing future demographic trends that will impact the primary and post-primary student numbers. The 'Projections of Full-Time Enrolment - Primary and Second Level, 2021 – 2040' report assessed demographic trends which will impact the future population growth or school age children including fertility rates, births and net migration.

The Department believes that the M1F2 scenario is the most likely outcome. This assumes slightly higher than current rates of migration, and fertility to remain at 1.6. Enrolments in primary schools in Ireland in 2020 stood at 561,411 down by almost 6,000 on 2019 (567,716). Enrolments are now projected to fall over the coming years under all scenarios, and under the M1F2 scenario will reach a low point of 440,551 by 2033. This is 120,860 lower than today's figure. Enrolments will rise again thereafter and are projected to stand at 474,888 by 2040, a rise of some 34,300 over the seven years 2033 to 2040.

Based on their research the Department of Education and Skills determined that the peak number of primary school age children was anticipated in 2018.

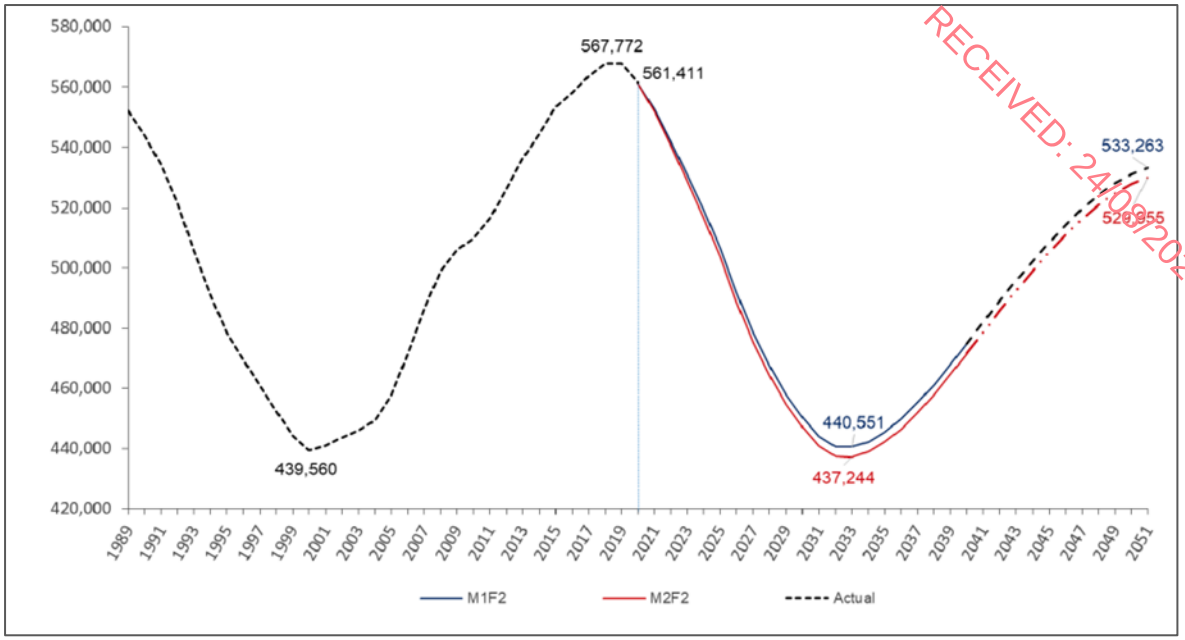

Figure 4.4 Actual vs Projected Enrolments in Primary Schools 1989-2051. Source: Department of Education

The post-primary student projections are a continuation of the primary school population projection with the peak of post-primary enrolments anticipated in 2024. The number of pupils entering first year is projected to rise by 996 in 2021, and then will begin to fluctuate slightly in 2022 and 2023 with a greater fall from 2024. By the end of the projection period there will be 17,000 fewer pupils entering first year than in 2021. Looking at LC2, Leaving Certificate, there will be 63,401 pupils enrolled in the 2021/22 academic, some 3,227 more than in 2020 while the projected peak year for Leaving Certificate sits is 2026 with 70,547 pupils.

Enrolments are projected to rise sharply over the coming years; there will be 11,133 more pupils in 2021 than in 2020, a further additional 7,520 in 2022 and by the peak year of 2024 it is projected there will be 29,600 more pupils in post-primary schools than today. The fall in pupil numbers after 2024 will be more gradual with numbers falling by 2,900 in 2026 and by 7,700 in 2029.

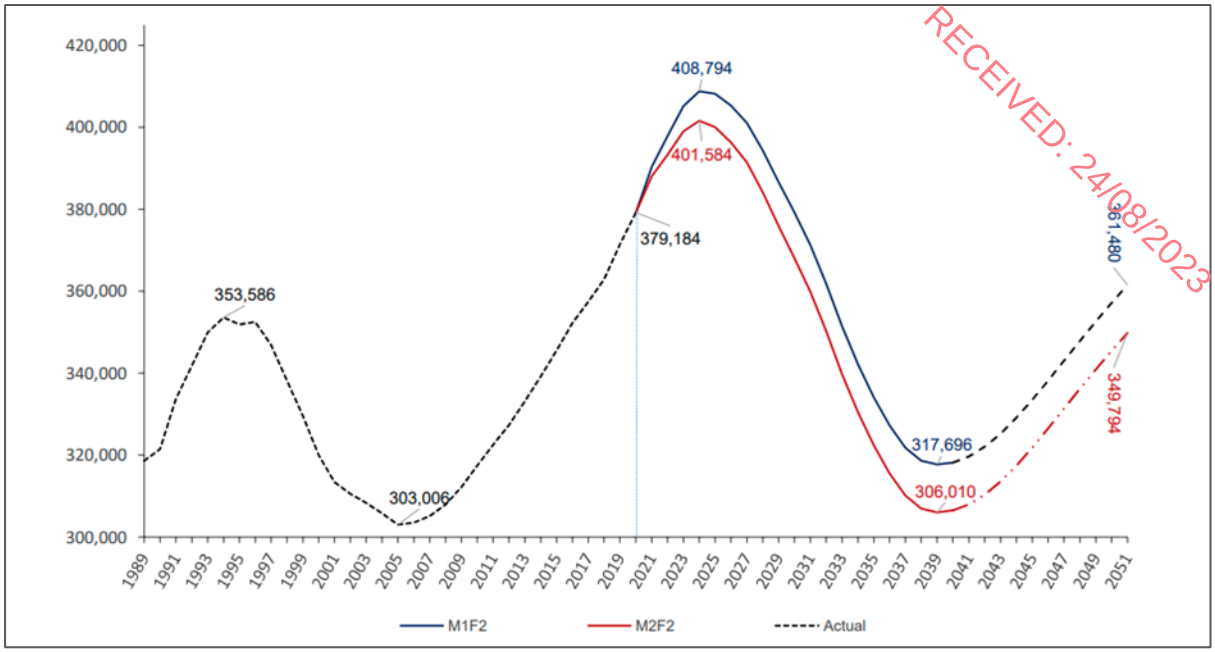

Figure 4.5 Actual vs Projected Enrolments in Post Primary Schools, 1989-2052. Source: Department of Education

In order to calculate the primary and post-primary school demand for the proposed development at Rathgowan.

- The household average of 2.6 represents the household average of the combined EDs within the catchment (refer to Table 4.2).
- The Primary Age Cohort (5-12 year olds) of 12.8% is applied consistent with the percentage for the combined EDs.
- The Post-Primary Age Cohort (13-18 year olds) of 7.8% is applied consistent with the percentage for the combined EDs.

The Forward Planning Unit of the Department of Education and Skills recommends that the estimated student population is determined using the following percentages:

- Primary School: 12%.
- Post-Primary: 8.5%.

It should be noted that the figure proposed for primary school exceed the actual proportion of the population which currently exists within the catchment area. Based on the assumptions outlined, an estimate of the student yield generated by the overall development has been estimated as follows:

Table 4.17 Projected Primary and Post Primary Students from Proposed Development

Cohort	Total 2+ Bed Units	Average Household Size	% Student Population	No. Students
Primary	365	2.6	12%	114
Post Primary			8.5%	81

It will take several years before the development is fully built out, and as the development is phased there is not likely to be a "peak" in demand for school places for a number of years as there will be a gradual transition between new school starters and school leavers.

Demand for school places may also be less than the maximum levels predicted, as some children's choice of school may be elsewhere in Mullingar Town and County Westmeath. Based on the social infrastructure audit conducted as part of the planning application submission, existing primary and post primary schools will provide capacity for new students generated in the short term. Therefore, the need for mitigation measures is not anticipated.

4.10.3.2.4 Economic Activity

In terms of the operational phase, the increase in population will result in increased demand for services which will support existing and new commercial and retail developments in Mullingar. Meeting the population targets set out in the Regional Spatial Economic Strategy (RSES) for the Eastern and Midland Region and the Westmeath CCDP 2022-2027 will help ensure that there is sufficient and gradual population growth that is in alignment with the economic growth and capacity of Mullingar.

4.10.3.2.5 Land Use and Amenity

During the operational phase, the change of the land use from greenfield/agricultural to primarily residential will permanently change the views currently enjoyed by adjacent properties and road users. This impact is visual and is dealt with in Chapter 10 Landscape and Visual Impact. Views from this location may be slight-moderate and negative in the short term, however as the existing trees and hedgerows continue to mature it is anticipated that this impact will lessen to slight and negative in the long term, as the proposed development is consistent with existing and emerging baseline trends in the area.

The amenity provision within the development is described in detail in the Architect's Design Statement. The landscaping within the development will frame the units, creating a user-friendly environment with a strong and attractive landscaping setting, defining the relationship and connectivity of the open spaces and beyond to the wider context. The future amenity value of the development is a positive consideration.

The development has been designed to incorporate the principles of Universal Design, to provide appropriate choice of accommodation to residents with diverse abilities and ages. Connectivity between the phases of the Masterplan development as well as with the existing built-up area is one of the key principles underpinning the design and layout. A Design Statement has been prepared by John Fleming Architects which provides insight into the design concept, and concludes that the development can be accessed, understood, and used by the widest possible extent of people, regardless of age, size and ability. This includes the houses and maisonette units as well as the external spaces, pedestrians and cycle routes and roads.

The primary source of noise with potential to cause a cumulative effect is traffic noise associated with the proposed phases of development. The operational traffic flow figures used in the assessment include traffic data for all three phases. In this way the potential cumulative effect has been assessed and determined to be imperceptible.

With regard to operational traffic, the proposed development (all 3 phases) is anticipated to have a slight negative long-term effect as a result of increased traffic flows on two of the junctions assessed (R394 and R393).

A vehicular access point will be provided off the C-Link Road for Phases 1-2 and Phase 3. This will include the provision of a footpath and cycleway to tie into the permitted facilities for the area.

Vehicular routes through the site will be calmed through various design measures including alignment, to reduce traffic speeds, with horizontal and vertical deflections introduced as required.

A design speed limit of 30 km/hour has been applied throughout the development in accordance with the Design Manual for Urban Roads and Streets (function – local road, context – neighbourhood, pedestrian priority).

A Traffic and Transport Assessment has been prepared by Tobin Consulting Engineers. The scope of the TTA was agreed with Westmeath County Council's Traffic and Transport Department.

The site layout has been informed by the Design Manual for Urban Roads and Streets (DMURS) issued by the Department of Transport, Tourism and Sport & Department of Environment, Community and Local Government, 2013, and in accordance with DMURS, provides a network of streets, pedestrian priority areas and traffic calming measures.

It is expected that the principal items of building and mechanical services plant that may generate operational noise will be associated with ventilation and heating of the creche. Plant will be selected to ensure no negative effects on receptors and designed to achieve the relevant noise criteria. Any impacts are likely to be negative, imperceptible and long-term.

4.10.3.2.6 Health

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

No likely negative impacts have been identified for the population or land use. Therefore, no mitigation measures are required.

The proposed development has been designed to avoid negative impacts in relation to local amenities and recreational facilities by incorporating amenity facilities within the layout, including a large open space area, play areas, kick about areas, as well as the provision for walking and cycling trails throughout the development that brings further connectivity to the town centre.

Accordingly, no further mitigation measures are required and no significant risks to human health have been identified within this discipline in relation to the operational phase of the development.

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.

4.11 Mitigation

No likely negative impacts have been identified for population, or land use, accordingly no mitigation measures are required. Mitigation measures have been proposed by other disciplines within this EIAR. A summary of these measures is provided in Chapter 15 Schedule of Mitigation and Monitoring Measures.

The proposed development of all 3 Phases has been designed to avoid negative impacts in relation to local amenities and recreational facilities by:

- Incorporating the provision of a creche within the design proposal (i.e. Phase 3)
- Incorporating amenity facilities within the layout, including various open space play areas and provision for walking, and cycling throughout the development

Accordingly, no further mitigation measures are required.

4.11.1 Health and Safety Mitigation Measures

In relation to the pre-construction and construction phases, health and safety risks will be managed in accordance with Safety, Health, and Welfare at Work (Construction) Regulations, 2013. Measures also set out in the preliminary CEMP, and include:

- Securing the Site Boundary and erecting of fencing or hoarding/signage as required
- Minimizing the disruption of services through adequate engagement with utility and service providers
- Restriction of construction working hours and traffic access
- Site access and egress
- Preparation of an Emergency and Evacuation Plan
- Maintenance of Public Roads
- Communication with Local Authorities and Neighbours

The design of the proposed development will be subject to safety design reviews to ensure that all requirements of the project are safe. A project supervisor for construction stage (PSCS) will have been appointed as part of the process. When issues are identified, corrective actions will be implemented to amend design issues prior to the issuance of final design for construction.

4.11.2 Construction Phase

During the Construction Phase, safety will be a primary concern. It is anticipated that a Project Supervisor for the Construction process (PSCP) will be appointed to oversee site safety. A contractor safety management program will be implemented identifying potential hazards associated with the proposed works. Temporary contractor facilities and areas under construction will be fenced off from

the public with adequate warning signs of the risks associated with entry to these facilities. Entry to these areas will be restricted and they will be kept secure when construction is not taking place. Measures to ensure public safety, with respect to construction traffic will be included in the Construction Traffic Management Plan, to be agreed with the Planning Authority prior to commencement of development.

4.11.3 Operational Phase

Measures to avoid potential negative impacts on Population and Human Health have been fully considered in the design of the project and are integrated into the final layout and design. Compliance with the layout and design will be a condition of the permitted development. As such no mitigation measures are required.

4.11.4 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 and educational institutions 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 stream along the northwest of the subject site, residential dwellings, schools, as well as businesses within the study area. 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.

4.12 Residual Impact Assessment

The proposed mitigation measures will avoid, prevent, or reduce impacts on the human environment during the construction and operational phases of the proposed development.

It is anticipated that the proposed development will result in significant positive overall economic and social benefits for the local community and the wider area. Strict adherence to the mitigation measures recommended within this EIAR will ensure that there will be no negative residual impacts or effects on the Population and Human Health from the construction and operation of the proposed scheme. Indeed, the delivery of much needed housing will have a positive effect for the local area.

4.13 Monitoring

No specific monitoring is proposed. In general, monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. It is anticipated that monitoring of compliance with Health & Safety requirements will be undertaken by the Project Supervisor for the Construction Process (PSCP). Monitoring is outlined in Chapter 9 Noise and Vibration, and Chapter 12 Material Assets: Traffic & Transport.

4.14 Significant Interactions

Population and human health do not have a significant number of interactions with other topics.

The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development compiles with all ambient air quality legislative limits and therefore the predicted impact is short term and imperceptible with respect to human health. For more information, please refer to Chapter 7: Air Quality.

Interactions between air quality and traffic can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality is considered to be imperceptible.

Construction phase activities such as land clearing, excavations, stockpiling of materials etc., have the potential for interactions between air quality and biodiversity along with 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 biodiversity.

It is also predicted that there will be no significant interaction between air quality and land and soils once mitigation measures are in place.

No other significant interactions with air quality and climate have been identified. A breakdown of these elements has been analysed further below.

4.14.1 Land and Soil

During construction works offsite removal of surplus soil will be required. The necessary mitigation measures will be implemented to address any nuisance issues associated with dust dispersion during this time. No public health issues associated with the land, soil, geology conditions at the site have been identified for the Construction Phase of the proposed development. Appropriate industry standard and health and safety legislative requirements will be implemented during the Construction Phase that will be protective of site workers.

4.14.2 Hydrology and Hydrogeology

No public health issues associated with the water (hydrology and hydrogeology) conditions at the proposed development site have been identified for the Construction Phase or Operational Phase of the proposed development.

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

4.14.3 Air Quality and Climate

Interactions between Air Quality and Population and Human Health have been considered as the Operational Phase 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 imperceptible, therefore, air quality impact from the proposed development are not expected to have a significant impact on population and human health.

4.14.4 Noise and Vibration

The impact assessment of noise and vibration has concluded that additional noise associated with the operation of on-site machinery will be intermittent and will not create any major negative impacts beyond the site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation form the proposed development.

4.14.5 Landscape and Visual

During the Construction Phase there will be visual changes associated with removal of some trees and hedgerows and emerging plant and machinery. During the Operational Phase there will be permanent visual changes to the landscape which may impact the residential dwellings surrounding the proposed development. A full impact assessment has been carried out in Chapter 9 Landscape and Visual Impact to quantify this impact.

4.14.6 Material Assets: Waste and Utilities

The improper removal, handling, and storage of hazardous waste could negatively impact on the health of construction workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health.

4.14.7 Material Assets: Traffic and Transport

There can be a significant interaction between population and human health and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affects Air Quality and thus Population and Human Health have been deemed as insignificant.

4.15 References & Sources

- Westmeath County Development Plan 2021-2027
- Central Statistics Office (CSO) Census 2016 Data. Available at: https://visual.cso.ie/?body=entity/ima/cop/2016&boundary=C03736V04484
- Primary School Enrolment Figures. Available at: https://www.gov.ie/en/collection/primary-schools/
- Post Primary School Enrolment Figures. Available at: https://www.gov.ie/en/collection/post-primary-schools/
- Pobal Maps Portal. Available at: https://maps.pobal.ie/

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 5

Land, Soils & Geology

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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5 Land, Soils and Geology

5.1 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 at Rathgowan, Mullingar, Co. Westmeath (hereafter referred to as the Site) 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 Site;
- Potential impacts that the Proposed Development may have on land, soils and geology including geological heritage assessments including "worst case" scenario assessment;
- Potential constraints that these features may place on the Proposed Development;
- Required mitigation measures which may be necessary to prevent or minimise any adverse impacts related to the Proposed Development; and
- Evaluate the significance of any residual impacts.

This chapter of the EIAR should be read in conjunction with Chapter 6 Hydrology and Hydrogeology, Chapter 7 Air Quality, Chapter 10 Landscape and Visual, Chapter 11 Waste, Chapter 12 Material Assets – Traffic and Transport and Chapter 14 Biodiversity of the EIAR and other information provided by the Applicant pertaining to the design proposals for the Proposed Development.

5.2 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 Member of the Institute of Environmental Sciences (MEnvSci) with over 10 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:

- Strategic Housing 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; and
- Strategic Housing Development at Claremont, Howth Road, Howth, Co. Dublin.

5.3 Proposed Development

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

The Site Layout for the Proposed Development is presented in Figure 1.1 of this EIAR.

5.3.1 Aspects Relevant to this Assessment

The Proposed Development will include the following components which are of particular relevance with respect to land, soils and geology.

5.3.1.1 Construction Phase

The Construction Phase of the Proposed Development will include:

- Cut and fill to maintain the maximum and minimum road gradient of 1/21 and 1/200 and to ensure units are level.
    - Maximum fill depths up to 1.6m, typically 0.5 to 1.0m.
    - Maximum cut depths up to 1.2m
- Excavation to reduce the levels to construction the building foundations to a maximum depth of 1.0 meter below ground level (mbGL).
- Excavation for construction of drainage infrastructure to a maximum depth of 3.5mbGL.
- There will be no requirement for the excavation of bedrock during the Construction Phase of the Proposed Development.
- The total excavated volume of soil for excavation to construct the Proposed Development is 12,020m^3. It is intended to reuse suitable excavated topsoil for landscaping and engineering use.
- Temporary stockpiling of excavated material pending re-use onsite .
- Based on the preliminary cut & fill analysis, the construction of the Proposed Development will also require the importation of 5,200m^3 soils to achieve the finished floor levels and road levels. There will also be a requirement for the importation of aggregates for the construction of roads and other infrastructure.
- Foundation will likely consist of reinforced strip footings, pads and reinforced concrete rafts.

5.3.1.2 Operational Phase

The Operational Phase of the Proposed Development consists of the typical activities in a residential development and with the exception localised gardening works by residents, there will be no bulk excavation of soils or bedrock or infilling of waste.

There will be no requirement for bulk storage of petroleum hydrocarbon-based fuels during the Operational Phase as the main operating system for heating will be air to water heat pump and further details are provided in Chapter 13 of this EIAR.

5.4 Methodology

5.4.1 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); and
- National Roads Authority, 2009. Guidelines on Procedures for the Assessment and Treatment of Geology, Hydrology and Hydrogeology for National Road Schemes (NRA, 2009).
- Westmeath County Council, 2021. Westmeath County Development Plan 2021-2017 (WCC, 2021);
- Westmeath County Council, 2014. Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014).

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

This stage of the assessment included a desk top study that comprised a review of the following sources of information:

- Environmental Protection Agency (EPA) webmapping 2023 (EPA, 2023);
- Geological Survey of Ireland (GSI) Datasets Public Viewer and Groundwater webmapping, 2023 (GSI, 2023);
- Google Earth Mapping and Imagery, 2023 (Google Earth, 2023);
- Ordnance Survey Ireland (OSI) webmapping, 2023 (OSI, 2023);
- National Parks and Wildlife Services (NPWS) webmapping, 2023 (NPWS, 2023);
- Teagasc webmapping, 2023 (Teagasc, 2023); and
- Information provided by the Applicant including:
    - Information pertaining to the design proposals for the Proposed Development; and
    - IGSL Ltd., 2020. Report on a Site Investigation for a Proposed Housing Development at Rathgowan, Mullingar (IGSL, 2020) including trial pit and borehole logs, soil laboratory testing, infiltration tests and site map.

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.

A site walkover survey to establish the environmental site setting and baseline conditions at the Site of the Proposed Development relevant to the land, soil and geology environment was undertaken by Enviroguide Consulting on the 21st April 2023.

Element 2: Involves Direct and Indirect Site Investigation and Studies stage where necessary to refine the CSM developed as part of Element 1 and evaluate the potential impacts associated with the Proposed Development. It was determined that there was adequate site-specific scientific data available for the assessment and no additional ground investigation in relation to land, soils and geology was undertaken.

Element 3: Evaluation of Mitigation Measures, Residual Impacts and Final Impact Assessment were based on the outcome of the information gathered in Element 1 and 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 and 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.

5.4.3 Description and Assessment of Potential Impact

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 5.1.

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 5.1.

Table 5.1 Criteria for Rating Site Importance of Geological Features (Source: IGI, 2013)

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.

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

5.4.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter is described in Table 5.2 as per EPA,2022 Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Table 5.2 Assessment of Potential Terminology and Methodology (Source: EPA, 2023)

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

5.5 Difficulties Encountered

There were no difficulties were encountered in the preparation of this Chapter of the EIAR.

5.6 Baseline Environment

5.6.1 Site Location and Surrounding Land Use

The site of the Proposed Development, which is 5.95 hectares (HA) in area, is located at Rathgowan, Mullingar, Co. Westmeath. The Site is accessed via the existing entrance off the roundabout on the R394 Regional Road (known locally as the 'c-link' road) which adjoins the northwest boundary of the Site.

The area surrounding the Site is characterised by a mix of land uses. The site is bound to the northwest by the R394 or C-Link with agricultural land beyond, to the southwest the R393 (known locally as 'Ashe

Road') and an ESB substation with b, and to the northeast and southeast by residential lands comprising two-storey detached and semi-detached dwellings.

The Site location is presented in Figure 5.1.

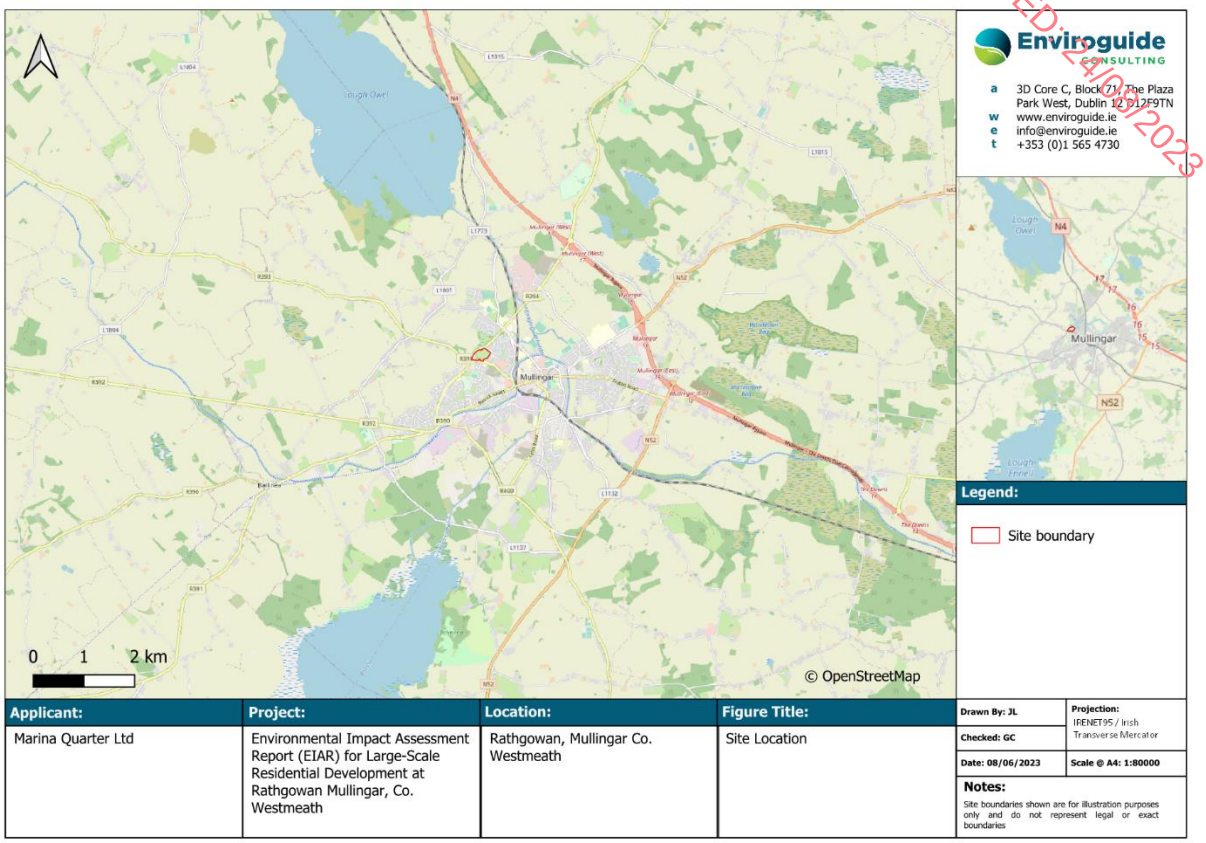

Figure 5.1.Site Location

5.6.2 Current and Historical Land Use

The primary land use at the site is currently agricultural farmland within two fields under grass pasture.

The lands across the site is zoned as 'Proposed Residential' to provide for residential development, associated services and to protect and improve residential amenity under Westmeath County Council's (WCC) Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014-2020).

Historical mapping and aerial photography available from the Ordnance Survey of Ireland website (OSI, 2023) and Google Earth (Google Earth, 2023) were reviewed and key observations on-site and off-site are summarised in Table 5.3.

Table 5.3 Historical Land Use (Source: OSI, 2023 and Google Earth, 2023)

Date	Information Source	Site Description
1837-1842	OSI map 6inch	**On-site:** The site is comprised of undeveloped grasslands separated by field boundaries. There are two small buildings/structures identified along the southwest boundary of the site. A historic gravel pit is identified encroaching into the southern corner of the site.

Date	Information Source	Site Description
		Off-site: There is a road identified along the southwest boundary of the site. The surrounding lands are predominantly open fields divided by field boundaries with a number of one-off buildings/structures. Columbs Barracks and the town of Mullingar are located to the east of the site. The Royal Canal is identified 0.59km east of the site at its closest point.
1888-1913	OSI 25 inch	**On-site:** The two small buildings/structures identified along the southwest boundary of the site is no longer identified. **Off-site:** There are several additional one-off buildings/structures identified in the surrounding lands. The Midland Great Western Railway line is located 0.52km west of the site at its closest point. There is increased development to the north of the site and the town of Mullingar extends beyond the eastern side of the Midland Great Western Railway line.
1830-1930	OSI 6-inch Last Edition Map	**On-site:** No significant changes **Off-site:** A sewerage works is identified 0.19km east of the site at its closest point. There is increased development in the town of Mullingar on the western side of the Midland Great Western Railway line and.
1995	OSI Aerial photography	**On-site:** The historic gravel pit is no longer encroaching onto the site. The site is comprised of undeveloped lands. **Off-site:** There is a building structure, which is understood to be the ESB substation, located along the southwest boundary of the site. A second building/structure is identified adjoining the southeast boundary of the site. There are also a number of additional one-off buildings/structures identified in the surrounding lands. There is some ground disturbance identified off the southern corner of the site, where the historic gravel pit was previously mapped. The sewerage works previously mapped to the east of the site is no longer identified.
1999-2003	OSI Aerial photography	On-site: No significant changes. Off-site: There are residential developments identified adjoining the southeast and northeast boundaries of the site. The land off the southern corner of the site, where the historic gravel pit was previously mapped, appears to be overgrown.
2004 -2006	OSI Aerial photography	On-site: No significant changes. Off-site: There is an increase in residential developments identified to the south of the road adjoining the southwest boundary of the site.
2005-2012	OSI Aerial photography	On-site: No significant changes. Off-site: A road (R394) with two roundabouts is identified along the northwest boundary of the site.
2023	Google Maps Photography	On-site: No significant changes. Off-site: No significant changes.

5.6.3 Topography

The site is relatively flat with gentle undulations and a slight sloping gradient to the northwest.

The topographic survey, presented in the site investigation report (IGSL, 2020) available in Volume 3 of this EIAR, identified that ground elevation across the site range from approximately 98.5m to 99m along the R394 at the northwest boundary of the site, rising to approximately 105mOD in the south-east corner of the site.

5.6.4 Soils

The soils beneath the site are mapped by the GSI (GSI, 2023) as follows:

- The majority of the site is underlain by grey, brown Podzolics, brown Earths (medium-high base status) (IFS Soil Code: BminDW). The parent material is 'till derived chiefly from limestone' (TLs).
- A small area along the southwest boundary of the site is underlain by surface water Gleys, ground water Gleys (IFS soil code: BminPD). The parent material is 'till derived chiefly from limestone' (TLs).

The GSI (GSI, 2023) mapped soils at the site are presented in Figure 5.2.

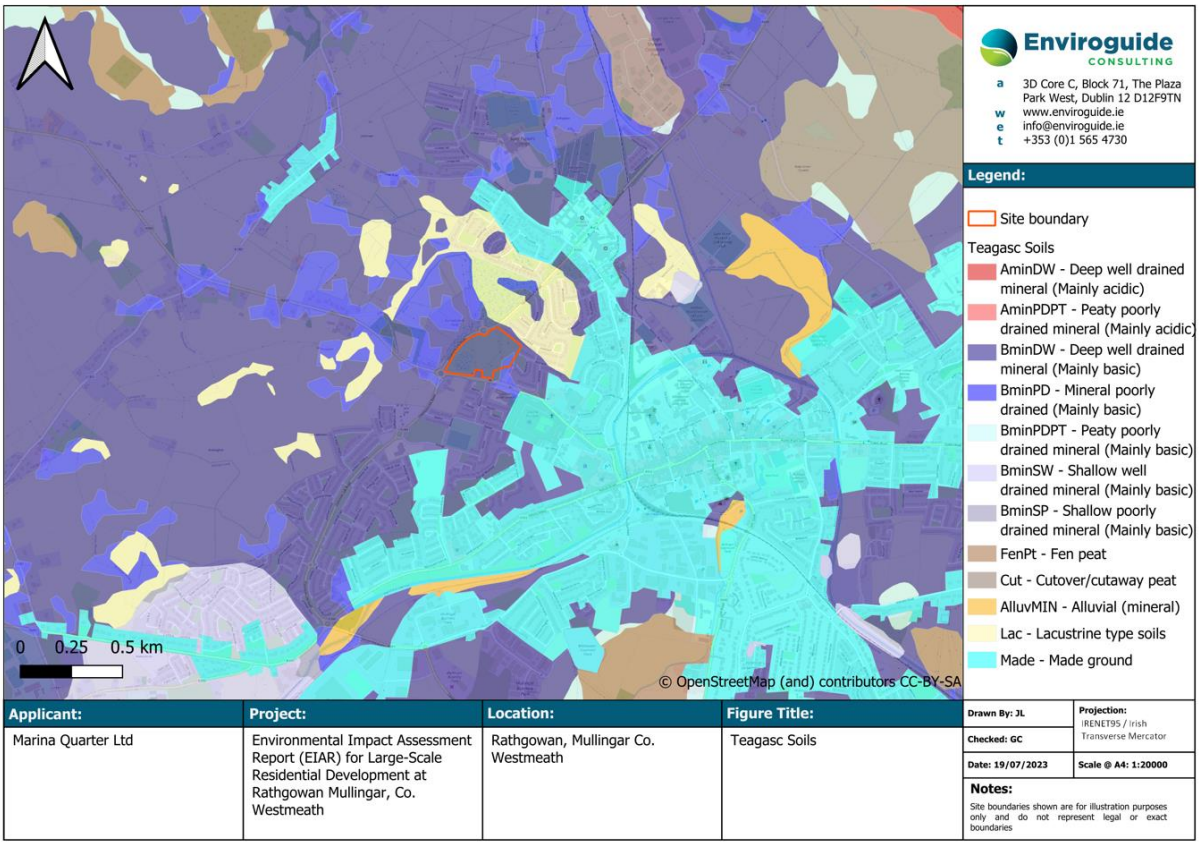

Figure 5.2 Soils

5.6.5 Quaternary Soils

The quaternary sediments beneath the site, are mapped by the GSI (GSI, 2023) as 'till derived from limestones' (TLs). The subsoil permeability is mapped as 'moderate' beneath the site (GSI, 2023).

The quaternary geology at the site, is presented in Figure 5.3.

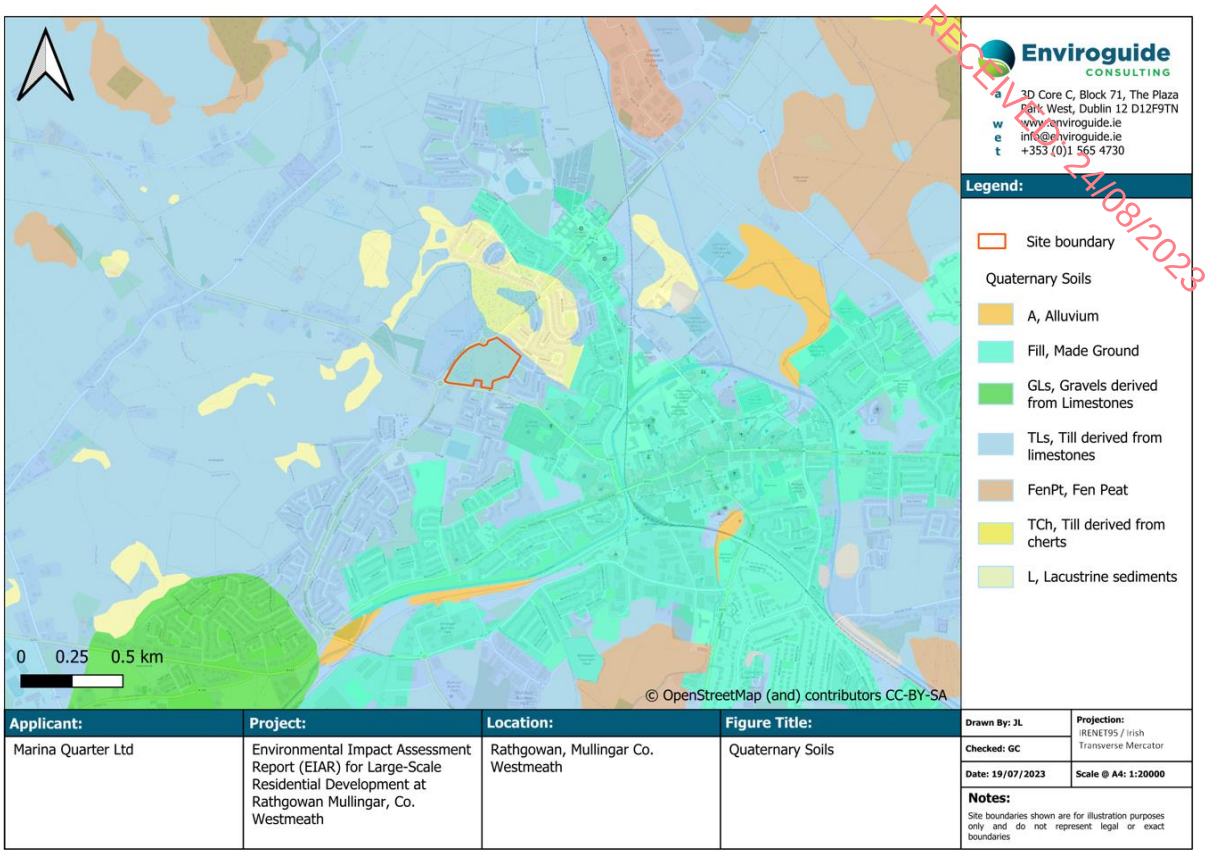

Figure 5.3 Quaternary Soils

5.6.6 Quaternary Geomorphology

There are a number of subglacial lineation's (drumlins) mapped by the GSI (GSI, 2023) within a 2km radius (GSI, 2023) to the northwest and southeast of the site. The subglacial lineation's are orientated in a northwest to southeast direction.

There is a deglacial landform area (hummocky sand and gravel) mapped by the GSI (GSI, 2023) approximately 1.33km southwest of the site.

5.6.7 Bedrock Geology

Based on the GSI database (GSI, 2023) the bedrock beneath the site is mapped as the Lucan Formation (Stratigraphic Code: LU, New Code: CDLUCN) which is comprised of 'dark grey to black, fine-grained, occasionally cherty, micritric limestones that weather paler, usually to pale grey from the lower Carboniferous period'. The formation ranges from 300m to 800m in thickness.

There are no outcrops mapped within the site however, there are a number of outcrops mapped within a 2km radius of the site, the closest of which is located 0.83km northeast of the site. The GSI bedrock geology map is presented in Figure 5.4.

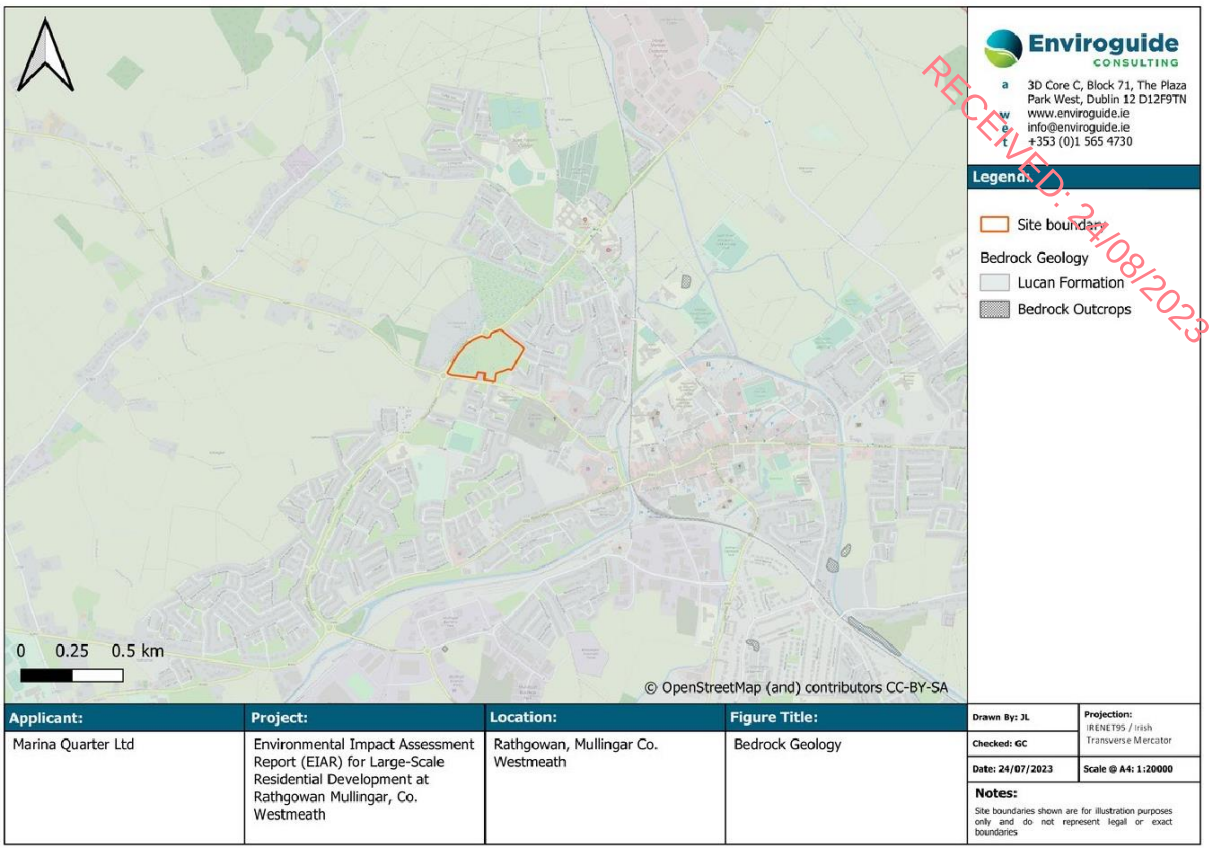

Figure 5.4 Bedrock Geology

5.6.8 Site Investigation Results

5.6.8.1 Soil and Geology

The soils and geology encountered during the site investigation (IGSL, 2020) available in Volume 3 of this EIAR are summarised as:

- Upper layer of soft light brown mottled grey slightly sandy gravelly SILT / CLAY, generally to depths ranging between 0.5 meters below ground level (mbGL) and 0.8mbGL; and
- Underlain by firm to stiff brown sandy gravelly SILT / CLAY with varying cobble and boulder content to the maximum depth of investigation at 5.7mbGL.
- An isolated occurrence of slightly silty gravelly SAND extended below the soft loamy CLAY from 0.5mbGL to the maximum depth of excavation at 2.7mbGL (TP13).
- Bedrock was not encountered during site investigations.

A groundwater strike at 4.2mbGL was recorded during drilling of borehole BH07. Groundwater was not encountered at remaining borehole and trial pit locations. Groundwater is assessed in Chapter 6 of this EIAR.

The site investigation locations are presented in Figure 5.5.

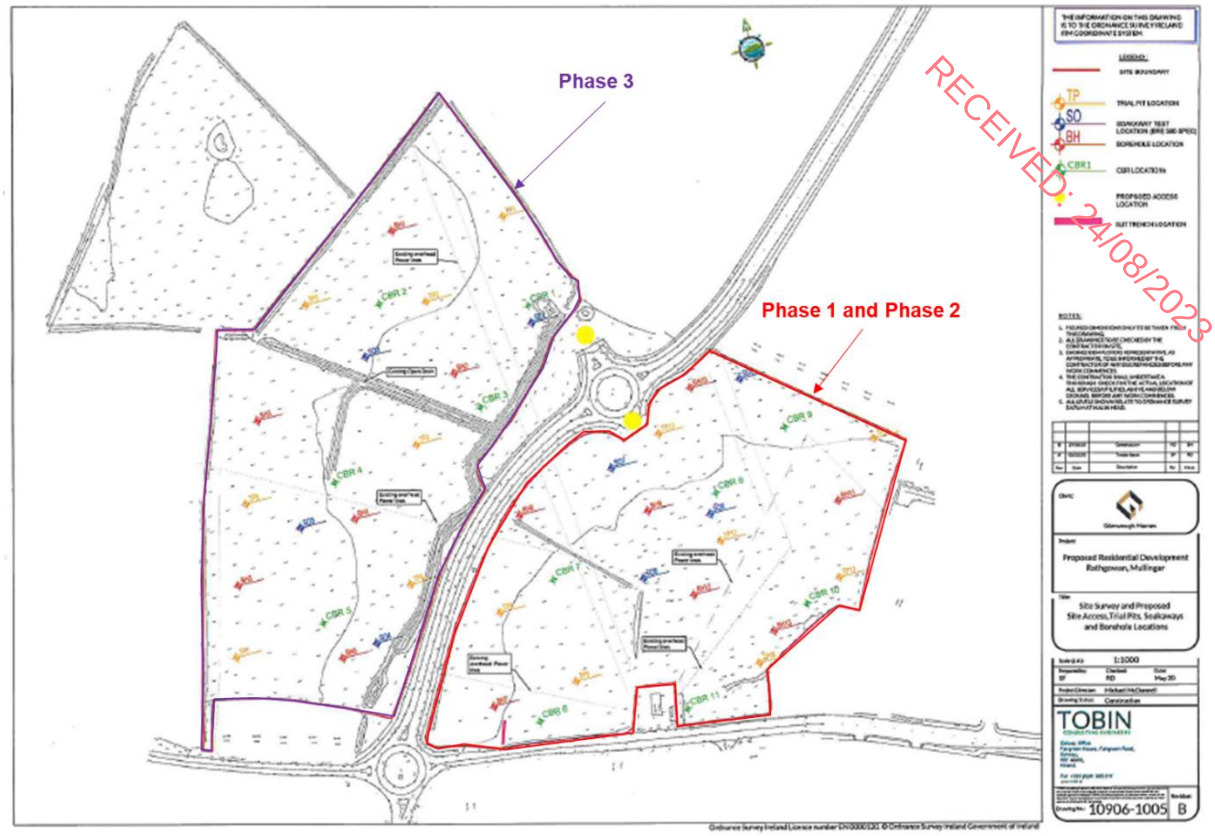

Figure 5.5 Site Investigation Locations (Source: IGSL, 2020)

5.6.8.2 Soil Analytical Results

Soil analytical data for soil samples collected from the site is provided in the site investigation report (ISGL, 2020) available in Volume 3 of this EIAR. The six (6No.) soil samples collected were tested in accordance with the RILTA suite, which is used to determine the suitability of soils for disposal to a landfill. The results of the analysis are provided in Appendix VII of the site investigation report (ISGL, 2020).

The results of the WAC analysis show all samples are in compliance with the inert landfill limits as stipulated in the European Landfill Directive and the excavated soils would be classified as inert material if removed from Site (IGSL, 2022).

Based on a review of the results, there is no evidence of anthropogenic contamination in sampled soils:

- The reported concentration of benzene, toluene, ethylbenzene, m/p-xylene and o-xylene (BTEX), mineral oil and Total Petroleum Hydrocarbons (TPHs) for all six (6No.) samples collected were less than the Limit of Detection (LOD); and
- No asbestos was detected in all six (6No.) samples collected.

5.6.9 Geochemical Domain

The GSI (GSI, 2023) defined Geochemical Domains maps indicates that the site of the Proposed Development is located within Domain 2 which is characterised as “carboniferous limestone, shale and related rocks”.

A summary of the metals values for Domain 2 are presented below in Table 5.4.

Table 5.4 Geochemically Appropriate Levels for Domain 2 (Source: GSI, 2023)

Element	Units	Value
Arsenic	mg/kg	24.9
Cadmium	mg/kg	3.28
Chromium	mg/kg	50.3
Copper	mg/kg	63.5
Mercury	mg/kg	0.36
Nickel	mg/kg	61.9
Lead	mg/kg	86.1
Zinc	mg/kg	197

5.6.10 Radon

The site of the Proposed Development is mapped by the EPA (EPA, 2023) as being in an area where about 1 in 10 homes in that areas are 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 however, it is noted that a high radon level can be found in any home, in any part of the country.

5.6.11 Geohazards

Earthquakes are not likely to occur in the vicinity of the site at a sufficient intensity to pose a risk for the Proposed Development. The GSI database (GSI, 2023) indicated that the site is located within an area of 'low' on the landslide susceptibility classification map.

The GSI (GSI, 2023) records for karst features indicates that there are no karst features within the site boundary or within a 2km radius of the site. The closest karst feature to the site is mapped by the GSI (GSI, 2023) a spring (Karst Feature I.D.: IE_GSI_Karst_40K_7669) located approximately 4.5km southeast of the site. The spring is not located within the Lucan Formation, which is the bedrock formation beneath the site.

5.6.12 Geological Heritage

A review of the GSI Geological Heritage Database (GSI, 2023) indicates that there are no geological heritage sites located at the site or within a 2km radius of the site. The closest geological heritage site is mapped by the GSI (GSI, 2023) as Mullingar Bypass (Site Code: MH019) a roadcut section along the N4 road north of Mullingar which exposes the limestone bedrock of the Lucan Formation.

5.6.13 Economic Geology

The lands within the site have no mapped granular aggregate potential (GSI, 2023). The bedrock beneath the site has been identified by the GSI (GSI, 2023) as having a 'moderate potential' for crushed rock aggregate.

There are a number of historical pits and quarries mapped by the GSI (GSI, 2023) located within a 2km radius of the site which are listed in Table 5.5.

Table 5.5 Historic Pits and Quarries within a 2km Radius of the Site (Source: GSI, 2023)

Name/Type	Status	Distance from Proposed Development(km)	Location from Site
Pit	Historic	0.0 (adjoins southeast boundary of the site)	Southeast
Quarry	Historic	1.27	Northwest
Pit	Historic	1.27	Northwest
Pit	Historic	1.91	Southwest
Pit	Historic	1.17	South
Quarry	Historic	1.31	South
Quarry	Historic	1.80	Southeast
Quarry	Historic	1.84	Southeast
Quarry	Historic	2.0	Southeast
Quarry	Historic	0.78	Northeast
Pit	Historic	1.53	Northwest
Pit	Historic	1.91	Northwest

5.6.14 Importance of Baseline Environment

It is noted that, in accordance with the TII Guidance as documented by the NRA (NRA, 2009) and as outlined in Table 5.1, the soil and geology underlying the Proposed Development would be rated as attributes of 'low' importance as the site is underlain by thick (in excess of 5.7m) of low permeability subsoils (comprised of firm to stiff sandy gravelly SILT / CLAY with low infiltration potential). There are no geological heritage sites, granular aggregate potential materials or geohazards recorded within the site boundary. The economic extraction of crushed rock aggregate (with 'moderate' potential) would not be feasible.

5.7 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 land.

5.8 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 and Site walkover to assess the degree to which these receptors will be impacted upon in the absence of mitigation.

The potential impacts associated with the construction phase and operation phase of the Proposed Development are summarised below.

5.8.1 Construction Phase

Land Take and Land Use

The Proposed Development will require a land take of 5.95 Ha and the land use at the site will change from greenfield agricultural land to residential. The lands across the site are zoned as 'Proposed Residential' to provide for residential development, associated services and to protect and improve residential amenity under the Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014). Therefore, there will be an unavoidable land take with loss of undeveloped land and soil with a 'negative', 'significant' and 'permanent' impact taking account of the surrounding land and zoning objectives.

Excavation of Soil and Subsoil

There will be unavoidable loss of in-situ soils and subsoils from the site as result of landscape development and to achieve formation levels for the Proposed Development. It is proposed that 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 construction of the Proposed Development will require the excavation of 12,020m^3 of soil and subsoil to depths of up to 1.2mbGL to achieve formation levels, to 1.0mbGL for foundations and to 3.5mnGL for drainage and infrastructure. Where possible, it is intended to retain and re-use suitable excavated soil and subsoil at the Proposed Development for engineering fill and landscaping. The soils underlying the site are considered to have 'low' importance. Accordingly, there will be a 'negative' 'slight' and 'permanent' impact on the underlying soils at the site.

Any material not suitable for re-use onsite will be removed offsite in accordance with applicable statutory requirements. may include where suitable, removal as by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011. The potential impact with removal offsite of surplus soil and other material as wastes is assessed in Chapter 11 of this EIAR.

Soil Quality and Contamination

The site currently comprises greenfield agricultural land. Laboratory analysis of soil samples collected as part of the site investigation (IGSL, 2020) indicate that the sampled soil can be classified as inert. The excavation and re-use of soil onsite will be subject to control procedures to ensure suitability for use onsite and in accordance with engineering and environmental specification for the Proposed Development.

There is a potential risk associated with the use of cementitious materials during construction of the building foundations, infrastructure and other in ground works at the site. It is considered that this may result in a 'negative', 'moderate' and 'long-term' impact on existing quality of soil within a localised area underlying the site of the Proposed Development.

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

Dust Generation

There is a potential for creation of windblown dust generation from the temporary stockpiling of materials on site. There will be some exhaust emissions generated from use of excavators, HGVs 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 7 of this EIAR.

Soil Structure

The excavation and re-use of soil and bedrock at the subject site will result in the exposure of the materials to various elements including weather and construction traffic. The temporary stockpiling of excavated soils pending reuse onsite will have a potential 'negative,' slight' and 'long term' impact' on the natural strength of the materials.

Importation of Soils, Subsoils and Aggregates

The Proposed Development will require the importation of 5,200m^3 soils to achieve the finished floor levels and road levels. There will also be a requirement for the importation of aggregates for the construction of roads and other infrastructure. The potential impacts may include loss of attribute and changes in the geological regime at the source site. It is anticipated that the required soils, subsoils and aggregates identified for importation onsite will be 'indirect' and have a 'indirect', '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.

5.8.2 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 at the site taking account of the design for the Proposed Development.

The design and construction of the proposed development in accordance with current Building Regulations will ensure that the site will be suitable for use for operational phase as a residential development taking account of the geological site setting.

The site has been identified as being located within a high radon area. Standard design measures including appropriate radon membranes will be incorporated into the design of building in accordance with relevant Building Regulations.

5.8.3 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.

A search of planning applications located within a 2km radius of the Proposed Development was conducted using online planning resources including the National Planning Applications Database (MyPlan.ie) and Westmeath County Council's online planning database. Any planning application listed as granted, application registered or application pending from within the last five years were assessed for their potential to act in-combination with the Proposed Development and cause likely significant effects on land, soils and geology. The larger-scale developments identified within the vicinity of the site of the Proposed Development and considered for potential cumulative effects are listed in Table 5.6.

Table 5.6 Planning Applications in the Vicinity of Site

Planning reference	Location relative to the Proposed Development	Development description
22515	North of the C-Link Road	Permission for the following Large-Scale Residential Development comprising of the construction of 213 no. residential units, 1 no. creche, 1 no. pumping station and all associated ancillary development works including 2 no. ESB sub-stations, footpaths, cycle lane, car and bicycle parking, drainage, bin storage, landscaping/amenity areas and the undergrounding of existing 38KV overhead electricity lines at Rathgowan, Mullingar, Co. Westmeath. Access will be via the existing roundabout on the R394 (C-Link). This development will form Phase 3 of a larger (three-phase) residential development at this location.
Part 8 Application	0.3km east of the Proposed Development.	Part 8 application for the construction of 22 no. dwelling units adjacent to Ashfield/Abbeylands/Green Road and St. Bridget's Terrace, Mullingar, Co. Westmeath.
Part 8 Application	2km east of the Proposed Development	The construction of 17 no. dwelling units on a site at the junction of Delvin & Robinstown Road, Springfield TD, Mullingar, Co. Westmeath.
Part 8 Application	0.8km south of the Proposed Development.	The construction of 15 no. single storey houses on four separate sites at Ennell Court and Trinity Cottages, Mullingar, Co. Westmeath.
Part 8 Application	1.3km east of the Proposed Development.	Proposed Housing Development of 32 no. dwelling units consisting of 19 no. 2 bed units and 13 no. 1 bed units at Friar's Mill Road / Canal Avenue, Mullingar, Co. Westmeath.
21568	0.6 km northwest of the Proposed Development Site.	An extension of duration was sought for 16/6001: planning reference no: 11/5121 for the construction of a new housing development, consisting of 28 no. houses to be constructed in 3 phases made up of a combination of 26 no. detached 2 storey houses (as per condition no.5 of outline permission planning ref. no. 11/4121) with associated services.

Planning reference	Location relative to the Proposed Development	Development description
196159	This site lies 1.8km south of the Proposed Development.	Planning permission was sought for the construction of 98 no. residential units consisting of 14 no. 2 bed terraced houses, 10 no. 3 bed end-terraced houses, 12 no. 3 bed semi-detached houses, 8 no. 4 bed semi-detached houses and 54 no. duplex units (comprising 27 no. 1 bed units and 27 no. 3 bed units). Provision of a creche and community facility, 142 no. car parking spaces, 8 no. motorcycling spaces and 102 no. bicycle spaces. Access from the R390. All site development and servicing works, bin stores, ESB substation, pumping station, open space, landscaping and boundary treatments.
196121	Directly east of the Proposed Development.	Planning permission was sought for the construction of 18 Apartment units in 2 Blocks (Block A & B). Block A consists of 1 no. 1 bedroom units, 3 no. 2 bedroom units and 2 no. 3 bedroom duplex apartment units in 2 and 3 storey high building with private balconies and patios. Block B consists of 6 no. 1 bedroom units and 6 no. 2 bedroom duplex apartment units in 3 storey high building with private balconies and patios. The proposed development will also consist of a new site entrance, shared access road, footpaths, car parking spaces, boundary wall and fence, covered cycle rack, recycling bin storage area, public and private open spaces, partial removal and trimming of existing hedgerows to accommodate proposed site entrance, landscaping and all associated site works and services.

Excavated soil and stone during the Construction Phase of the Proposed Development could potentially be directed to the same receiving waste facilities for recovery / disposal as excavated soil and stone from other developments in the vicinity of the site or within the wider Westmeath area. While it is proposed to reuse all soils onsite, some proportion of cut material may be considered unsuitable. All surplus soils and stone from the site will be removed offsite in accordance with all statutory legislation. Accordingly, it is considered that any cumulative impact on land, soils and geology associated with the Proposed Development will be 'neutral' 'imperceptible' and 'permanent'.

There are no other cumulative impacts associated with land, soil and geology associated with the Construction and Operational Phase of the Proposed Development.

5.9 Mitigation

5.9.1 Construction Phase Mitigation

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

A preliminary Construction Environmental Management Plan (CEMP) has been prepared by Tobin Consulting Engineers (Tobin Consulting Engineers, 2023a). Following appointment, the contractor will be required to implement the measures set out CEMP and maintain environmental monitoring records for the duration of the project which shall be made available to representatives from Westmeath

County Council for inspection on request. The CEMP is considered as a 'Live Document' and will be updated accordingly throughout the project as required.

Mitigation works will be adopted as part of the construction works for the proposed development. The measure will address the main activities of potential impact which include:

- Control and Management of water and surface runoff;
- Control of Management of works nears water courses;
- Control of Management of materials from off-site sources;
- Appropriate fuel and Chemical handling, transport and storage; and
- Management of accidental release of contaminants at the subject site.

A Construction Demolition & Operational Waste Management Plan (CDOWMP) has been prepared by Tobins Consulting Engineers for the Proposed Development (Tobins Consulting Engineers, 2023b). The purpose of the CDWOMP is to ensure that waste storage and movement within the development takes place in a matter which compiles with relevant legislation and has a minimum impact on the nearby existing commercial and residential areas.

The CDWOMP (Tobin Consulting Engineers, 2023b) includes estimated quantities of construction waste which will be produced during the Construction of the Proposed Development. The CEMP (Tobin Consulting Engineers, 2023a) and CDOWMP (Tobin Consulting Engineers, 2023b) will take cognisance of measures outlined in the EIAR.

Import of Aggregates

As outlined in the CEMP (Tobin Consulting Engineers, 2023a), all fill and aggregates will be sources from reputable, approved supplied. As a minimum, all suppliers will be required to:

- Provide aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development.
- Provide proof of an acceptable environmental management status; and
- Provide proof of the regulatory and legal compliance status of the company.

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

Airborne Dust Generation

Excavated soils will be carefully managed and maintained in order to minimise potential impact on soil quality and soil structure. Handling of soils will be undertaken in accordance with documented procures that will be set out in order to protect ground and minimise airborne dust. The normal 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 will require additional wetting at the point of dust release, dampening down during dry weather and wheel

cleaning for any vehicles leaving the site. Potential impacts and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 7 of this EIAR.

As outlined in the CEMP (Tobin Consulting Engineers, 2023a), excavated material will be removed as soon as possible minimising the potential for stockpiles to created windblown dust. Daily inspections by the main contractor will be carried out to identify potential sources of dust generated along with implementation measures to remove caused which are found.

Impacts of dust from the use of excavators, HGVs and vibrating rollers are considered to be temporary in duration and not considered to give rise to significant air quality impacts following the implementation of the following measures as set out in the CEMP:

- All machinery will be suitably maintained to ensure that emissions of engine-generated pollutants shall be kept to a minimum in accordance with Measures Against the Emission of Gaseous and Particulate Pollutants from Internal Combustion Engines to be Installed in Non-Road Mobile Machinery (2002/88/EC) and Emissions of Pollutants from Diesel Engines (2005/21/EC);
- Vehicles will not be left unnecessarily idling on the site and trucks removing demolition waste from the site will turn off engines during loading.
- Pre-start checks on all machinery will be conducted daily prior to commencement of activities.
- Low emission fuels will be used insofar as possible; and
- Mains power will be used for small plant and equipment, where possible, in preference to generators.

Reuse of Soil

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

Management and Control of Soils and Stockpiles

The re-use of suitable cut material on-site for the Proposed Development (i.e., landscaping, raising levels or engineering fill) will be undertaken in accordance with the engineered design of the Proposed Development. Surplus or unsuitable soils will be removed offsite.

Segregation and storage of soils for re-use onsite or removal off-site and waste for disposal off-site will be segregated and temporary stored on-site pending removal or for reuse on-site in accordance with the CEMP (Tobin Consulting Engineers, 2023a).

As detailed in the CEMP (Tobin Consulting Engineers, 2023a), temporary storage of soil and stockpiles will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any open surface water drains. No soil storing will be allowed within 30m of the open water where sufficient working areas are available within the site boundary, which is in line with Inland Fisheries Ireland guidelines.

The 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 on site, off site and waste materials will be individually segregated; and all segregation, storage and stockpiling locations will be clearly delineated on the site drawings;
- Tarpaulins or polythene sheets will be used to cover stockpiles of material during heavy rainfall to avoid sediment release;
- Material identified for reuse on site, off site and waste materials will be individually segregated;
- Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust; and
- Stockpiles will be a minimum of 10m from drains.

Export of Resource (soil) and Waste

All surplus materials and any waste will be removed off-site in accordance with the requirements outlined in the CDWOMP (Tobin Consulting Engineers, 2023b) 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 off-site.

The re-use of soil and rock 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.

Materials and waste will be documented prior to leaving the site. All information will be entered into a waste management register kept on the site.

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

Public roads outside the site, in particular the R394, shall 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. A wheel-wash system will be set up in the event there is a risk of debris deposited on the road as outlined in the CEMP (Tobin Consulting Engineers, 2023a).

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 Contractor and in accordance with the CEMP (Tobin Consulting Engineers, 2023a) and relevant industry standards.

All ready-mixed concrete will be delivered to the site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

A suitable risk assessment for wet concreting shall be completed prior to works being carried out.

Handling of Fuels, Chemicals and Materials

Fuelling and lubrication of equipment will be carried out in a designated areas of the site away from any existing manholes or gullies. Fuelling and lubrication of equipment will only be carried out in a designated area of the site away from any existing manholes or gullies. At present, it is proposed that fuel and lubricants will be stored adjacent to the office compound.

Bunds will have regard to Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013c). 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.

This bunded area will be roofed appropriately to exclude rainwater. Mobile fuel bowsers may be used for refuelling heavy equipment. Bowsers used will be double skinned and spill kit/drip tray equipment will be used during refuelling which will take place away from any nearby drains or watercourses and from any surface water drainage gulley's (Tobin Consulting Engineers, 2023a).

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.

As outlined in the CEMP (Tobin Consulting Engineers, 2023a), spill kits will be made available onsite and identified with signage for use in the event of an environmental spill or leak. A spill kit will be kept in close proximity to the fuel storage area for use in the event of any incident during refuelling or maintenance works. Heavy machinery used on the site will also be equipped with its own spill kit.

Emergency Procedures

In the event of an environmental incident, the appointed Project Environmental Manager will be notified immediately, and absorbent materials used to prevent the spread of the spill/leak. The contaminated materials will be transferred to leak-proof storage containers and any contaminated soils or gravels excavated and removed off-site. A record of the incident will be kept, and Westmeath County Council will be notified.

Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;

- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the site and compliantly disposed 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 for in the event of accidental fuel spillages; and
- All construction works staff on-site will be fully trained on the use of equipment.

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

Welfare Facilities

Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Portaloos will be provided in the compound initially, with a dedicated toilet block installed later. 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.

5.9.1.1 Monitoring

During the Construction Phase of the Proposed Development 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 measure that are protective of water quality are fully implemented and effective;
- Materials management and waste audits will be carried out at regular intervals to monitor the following:
    - Management of soils on-site and for removal offsite.
    - Record keeping.
    - Traceability of all materials, surplus soil and other waste removed from the site; and
    - Ensure records are maintained of material acceptance at the end destination.

5.9.2 Operational Phase Mitigation

There is no requirement for mitigation measures for the Operational Phase taking account of the design measures for the proposed development.

5.9.2.1 Monitoring

Ongoing regular operation monitoring of the SUDs measure will be undertaken throughout the lifetime of the operational phase of the Proposed Development. The management and maintenance requirements for the each of the SUDs are developed in line with the CIRIA SUDs Manual.

5.9.3 Cumulative Mitigation

Not relevant.

5.10 Residual Impact Assessment

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

Table 5.7 Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Construction of the Proposed Development	Land Take and Land Use	The Proposed Site will development land for residential use, resulting in a change in land from greenfield to residential.	Negative	Significant	Permanent	Direct	Unavoidable and no mitigation. The Proposed Development is in line with 'Proposed Residential' zoning objectives of the Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014).	Significant
Excavation of In-situ soils and subsoil	Soils and Bedrock	There will be an unavoidable a loss of in-situ soil and subsoil through excavation works to achieve the formation levels for the Proposed Development including the foundations, roadways, parking, drainage	Negative	Slight	Permanent	Direct	None required. It is proposed to retain and re-use suitable excavated soil and subsoil at the Proposed Development for landscaping and to raise site levels. The removal of all surplus soil will be undertaken in accordance with applicable statutory requirements.	Slight

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
Accidental release of deleterious materials including cement, fuel and other material being used on-site.	Soils, Subsoils and Bedrock	Potential (albeit low) for uncontrolled release of deleterious materials including fuels, cement and other materials being used on-site, through the failure of secondary and tertiary containment or a materials handling accident, to the land, soil, and geological environment.	Negative	Moderate to Significant	Long-term	Direct	Refuelling and lubrication of plant during the construction phase will only be carried out in designated impermeable areas on site. Any other diesel, fuel or hydraulic oils stored on-site or within fuel containing equipment will be stored in bunded storage tanks / drip trays. The cementitious materials will avoid contamination of using appropriate design and methods implemented by the appointed Contractor and in accordance with industry standards.	Imperceptible
Stockpiling of excavated topsoil 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	Slight

Activity	Attribute	Predicted Impact	Quality	Significance	Duration	Type	Mitigation	Residual Impact
							minimise potential impact on soil quality.	
Import of required soil, subsoil and aggregates	Land, Soil and geology at the source Site	The Proposed Development will require the importation of 5,200m^3 soils and subsoils. There will also be a requirement for the importation of aggregates. The potential impacts may include loss of attribute and changes in geological setting at the source site.	Negative	Slight	Permanent	Indirect	Only certified materials from authorised sources will be used.	Imperceptible.
Operational Phase								
Use of Proposed Development	Land, Soil and Geology	In a worst-case scenario of accidental spillage of fuel from a car engine and failure of SUDs, there is a potential risk on the receiving land, soil and geology.	Negative	Moderate	Long-term	Indirect	The SUDs measures will be incorporated into the design of the Proposed Development. Ongoing regular operational monitoring and maintenance of drainage and the SUDs measure will be undertaken throughout the lifetime of operational phase of the proposed development.	Imperceptible

5.11 Risk of Major Accidents or Disasters

Earthquakes are not likely to occur in the vicinity of the site at sufficient intensity to pose a risk for the Proposed Development. The GSI database (GSI, 2023) indicate the subject site is located within an area of 'Low' susceptibly to landslides.

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

Therefore, there is no identified geohazard risk and the potential risk of major accident or disaster at the Proposed Development is considered 'neutral' 'imperceptible' and 'permanent'.

5.12 Significant Interactions

5.12.1 Population and Human Health

An assessment of the potential impact of the Proposed Development on human health is included in Chapter 4 of this EIAR. There is a potential risk of dust generated from excavation and stockpiling of soil during the Construction Phase of the Proposed Development posing a human health risk in the absence of standard avoidance and mitigation measures which will be implemented to be protective of human health.

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

5.12.2 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 a result of the excavation and importation of materials to the site are included in Chapter 14 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.

5.12.3 Hydrology and Hydrogeology

An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 6 of this EIAR. In the absence of avoidance, remedial and mitigation measures, there is a potential for sediment from excavated soils entering runoff and discharging into the site drainage during the Construction Phase. Procedures for the protection of receiving water environment are set out Chapter 6 of this EIAR.

5.12.4 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. An assessment of the potential impact of the Proposed Development on air quality and climate is included in Chapter 7 of this EIAR.

5.12.5 Landscape and Visual

During the construction phase and into the operational phase of the Proposed Development, the site landscape will undergo a change from greenfield to residential with landscaping. An assessment of the potential impact of the Proposed Development on the receiving landscape is included in in Chapter 10 of this EIAR.

5.12.6 Material Assets – Waste, and Traffic & Transportation

An assessment of the potential impact of the Proposed Development on the Material Assets (Waste) and Material Assets (Traffic and Transportation) are included in Chapter 11 and Chapter 12 of this EIAR respectively.

It is proposed to reuse all the soils generated on site for the construction phase to level the ground. Any surplus material not suitable for reuse on site will be removed offsite. There is a requirement of approximately 5,200m^3 net import to achieve the required ground levels. Importation of aggregates will be required during the construction of the Proposed Development.

5.12.7 Cultural Heritage and Archaeology

An assessment of the potential impacts of the Proposed Development on Cultural Heritage and Archaeology is included in Chapter 15 of this EIAR. During construction of the Proposed Development there will be interactions between the land, soil and geology and the Archaeology during the excavations of soils across the site with the potential for disturbance of archaeological remains.

5.13 References & 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).

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

Environmental Protection Agency, 2023. EPA Envision Maps. https://gis.epa.ie/EPAMaps/. Consulted on 05/07/2023.

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, 2023. GSI web mapping. https://dcenr.maps.arcgis.com/apps/MapSeries/index.html?appid=a30af518e87a4c0ab2fbde2aaac3c228. Consulted on 03/07/2023.

Google Earth Pro, 2023. Consulted on 05/07/2023.

IGSL Ltd., 2020. Report on a Site Investigation for a Proposed Housing Development at Rathgowan, Mullingar

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); and

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

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;

Tobin Consulting Engineers, 2023. Preliminary Construction Environmental Management Plan Proposed Residential Development at Rathgowan, Mullingar.

Tobin Consulting Engineers, 2023. Construction Demolition & Operational Waste Management Plan Proposed Residential Development at Rathgowan, Mullingar.

Westmeath County Council, 2021. Westmeath County Development Plan 2021-2017 (WCC, 2021);

Westmeath County Council, 2014. Mullingar Local Area Plan 2014-2020 as extended to 2025 (WCC, 2014).

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 6

Hydrology & Hydrogeology

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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6 Hydrology and Hydrogeology

6.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the Proposed Development on the receiving hydrology and hydrogeology (water) environment at Rathgowan, Mullingar, Co. Westmeath (hereafter referred to as the site) 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.
- 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; and
- 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 5 Land, Soil and Geology, Chapter 13 Material Assets – Service Infrastructure and Utilities and Chapter 14 Biodiversity of the EIAR and other information provided by the Applicant pertaining to the design proposals for the Proposed Development.

6.2 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, with over 10 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:

- Strategic Housing 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; and
- Strategic Housing Development at Claremont, Howth Road, Howth, Co. Dublin

6.3 Proposed Development

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

6.3.1 Aspects Relevant to this Assessment

The Proposed Development will include the following components which are of particular relevance with respect to hydrology and hydrogeology.

6.3.1.1 Construction Phase

The Construction Phase of the Proposed Development will include:

- Cut and fill to maintain the maximum and minimum road gradient of 1/21 and 1/200 and to ensure units are level.
    - Maximum fill depths up to 1.6m, typically 0.5 to 1.0m.
    - Maximum cut depths up to 1.2m
- Excavation to reduce the levels to construction the building foundations to a maximum depth of 1.0 meter below ground level (mbGL).
- Excavation for construction of drainage infrastructure to a maximum depth of 3.5mbGL.
- It is anticipated that groundwater will not be encountered during excavations and thus the requirement for dewatering during the Construction Phase of the Proposed Development is not anticipated.
- Construction of new foul and mains water connections in accordance with UE Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03), UE's Code of Practice for Water Infrastructure (IW-CDS-5020-03).
    - There will be two (2No.) foul water connections; one (1No.) gravity and one (1No.) pumped. The gravity network will convey foul water from circa. 99No. units to the existing UE 225mm sewer to the south of the Proposed Development. The remaining 82No. units will discharge via a 110mm PE rising main along the C-Link Road, to the existing UE 525mm foul sewer.
    - There will be one (1No.) main water connection to the existing UE 400mm watermain located along the R394 to the northwest of the entrance to the Proposed Development, and a second connection to the existing UE 100mm watermain located within Ashe Road in the southern corner of the site.
- Temporary stockpiling of excavated material for the re-use on site.
- Construction of new surface water drainage designed in accordance with Sustainable Drainage Systems (SuDS) principals. Connection to the surface water network for the approved Phase 3 development (Planning Reference No. 22/515) located along the R394-C Link Road.

6.3.1.2 Operational Phase

Surface Water Drainage

As outlined in the Civil Works Design Report (Tobin Consulting Engineers Ireland, 2023c included in Volume 3 of this EIAR), surface water from the Proposed Development will be managed in accordance with the principles and objectives of Sustainable Drainage Systems (SuDS) and the Greater Dublin Sustainable Drainage System (GDSDS) to treat and attenuate water.

The Proposed Development has been divided into four (4No.) catchment areas (A, B, C and D). These networks will each direct flow through a petrol interceptor before discharging into the four (4No.) proposed soakaways designed in accordance with BRE Digest 365, Soakaway Design, 2007 Edition.

Controlled overflow from the proposed soakaways will flow via gravity to the northern boundary of the site before discharging at green field runoff rates to the surface water network for the approved Phase 3 residential development (Planning Reference No. 22/515) located along the R394-C Link Road. It is understood by Enviroguide Consulting, that surface water from the Proposed Development will ultimately discharge to the Brosna River (River Waterbody Code: IE_SH_25B090100).

The surface water drainage for the Proposed Development has been designed to cater for surface water runoff from all hard surfaces including roadways, carparks, and roofs, and will adequately accommodate the 1 in 100year rainfall event plus 20% to account for the effects of climate change.

The following attenuation and sustainable drainage systems (SuDs) measures will be incorporated into the Proposed Development as detailed in the Civil Works Design Report (Tobin Consulting Engineers Ireland, 2023c as included in Volume 3 of this EIAR),

- Water butts;
- Rain gardens;
- Tree pits;
- Permeable Paving;
- Drainage kerbs with infiltration trenches/swales;
- Petrol / Oil Separators; and
- Soakaways.

Foul Water

As outlined in the Civil Works Design Report (Tobin Consulting Engineers Ireland, 2023c included in Volume 3 of this EIAR), the proposed foul network has been divided into two (2No.) networks prior to discharging offsite as follows:

- Foul water for two thirds the Proposed Development will discharge under gravity to the existing UE 225mm foul sewer at the point of connection in the southwest corner of the site.
- Foul water for the remaining one third of the Proposed Development will be pumped via the pumping station located in the north of the site (previously granted planning by WCC (Planning Reference No. 22/515)) to a 110mm PE rising main on the R394 C-Link Road along the northwest boundary of the site before discharging to the existing UE 525mm foul sewer located circa. 80m north of the Proposed Development. It is noted that the pump station has been designed with consideration to the Proposed Development to ensure that there is sufficient capacity to accept foul water from the Proposed Development.

The UE Confirmation of Feasibility (CoF) letter dated 3rd of August 2023 states that the foul water connection is feasible subject to upgrades (Ref: CDS23002571). The UE CoF letter notes the following in relation to the WWTP connection:

"We can confirm that there is sufficient capacity in the wastewater treatment facility to cater for this development.

The Development can be facilitated at the existing 525mm sewer north west of the site on the R394. This will require a rising main of approximately 470m along the R394. If feasible a gravity connection

to the sewer should be considered. If this proposed development proceeds to application when all the foul water entering the pumpstation must be pumped to the north."

As documented in the Civil Design Report (Tobin Consulting Engineers 2023c included in Volume 3 of this EIAR) foul water from the Proposed Development will be pumped via the pump station previously granted planning by WCC (Planning Reference No. 22/515) to a 110mm PE rising main on the R394 C-Link Road before discharging to the existing UE 525mm foul sewer. Thereby meeting the UE requirements outlined in the UE CoF letter (Ref: CDS23002571).

Foul water from the Proposed Development will be treated at the Mullingar Wastewater Treatment Plant (WWTP) (EPA Licence No. D0008-01) before ultimately discharging to Brosna River (River Waterbody Code: IE_SH_25B090100).

Water Supply

As outlined in the Civil Works Design Report (Tobin Consulting Engineers Ireland, 2023c included in Volume 3 of this EIAR), water supply to the Proposed Development will be from the two (2No.) existing UE watermains as follows:

- The existing UE 400mm Asbestos watermain located within the R394 C-Link Road to the northwest of the entrance to the Proposed Development; and
- The existing UE 100mm uPVC watermain located within Ashe Road in the southern corner of the site.

The UE Confirmation of Feasibility letter dated the 3rd August 2023 (COF Reference: CDS23002571) states that the water supply connections are 'feasible subject to updates'. The UE CoF letter notes the following in relation to the watermain connection.

"There is sufficient capacity in the water treatment facility to facilitate the proposed development. Please note, the proposed connection point is off the 400AC main to the north of the proposed development. A new meter and PRV will have to be installed."

As outlined in the Civil Design Report (Tobin Consulting Engineers Ireland, 2023 included in Volume 3 of this EIAR) the upgrades will take place as per UE requirements.

As documented in the Civil Design Report (Tobin Consulting Engineers 2023c included in Volume 3 of this EIAR) the Proposed Development will include a 150mm watermain connection from the existing 400mm watermain which runs along the R394-C Link Road. The proposed 150mm watermain will also connect directly to the existing UE 100mm watermain on Ashe Road. This interconnectivity will fortify the water network in the area as advised by UE, and thereby meeting the UE requirements outlined in the UE CoF letter (Ref: CDS23002571).

6.4 Methodology

6.4.1 Relevant Legislation & Guidance

The methodology adopted for this assessment takes cognisance of the relevant guidelines in particular, the following:

- 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; and
- 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);
- 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; and
- Environmental Protection Agency, May 2022. Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022).

6.4.2 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 Consulting 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 of the Proposed Development 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 the EIAR, extends beyond the site boundaries and includes a 2.0km radius of the 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 of the Proposed Development 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 of the Proposed Development relevant to the hydrological and hydrogeological environment was undertaken by Enviroguide Consulting on the 21st April 2023

The Element 1 stage of the assessment was completed by Enviroguide Consulting and included the review of the following sources of information:

- Environmental Protection Agency (EPA) web mapping (EPA, 2023).
- Geological Survey Ireland (GSI) Datasets Public Viewer and Groundwater web mapping (EPA, 2023).
- National Parks and Wildlife Services (NPWS) web mapping (NPWS, 2023).

- Ordnance Survey Ireland (OSI) web mapping (OSI, 2023).
- Water Framework Directive Ireland (WFD) web mapping (WFD, 2023).
- Office of Public Works (OPW) database on historic flooding and the Catchment Flood Risk Assessment and Management (CFRAM) maps (OPW, 2023); and
- Information provided by the Applicant including:
    - Information pertaining to the design proposals for the Proposed Development; and
    - IGSL Ltd., 2020. Report on a Site Investigation for a Proposed Housing Development at Rathgowan, Mullingar (IGSL, 2020) including trial pit and borehole logs, infiltration tests and site map.

Element 2: Involves Direct and Indirect Site Investigation and Studies stage where necessary to refine the CSM developed as part of Element 1 and evaluate the potential impacts associated with the Proposed Development. It was determined that there was adequate site-specific scientific data available for the assessment and no additional ground investigation in relation to hydrology and hydrogeology was undertaken.

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 Element1 of the assessment were considered in relation to the Construction and 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.

6.4.3 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 6.1

Table 6.1 Criteria for Rating Site Importance of Hydrogeological Features (Source: IGI, 2013)

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.

Importance	Criteria	Typical Example
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.

6.4.4 Description and Assessment of Potential Impact

Impacts will vary in quality from negative, to neutral or positive. The effects of impacts will vary in significance on the receiving environment. Effects will also vary in duration. The terminology and methodology used for assessing the 'impact' significance and the corresponding 'effect' throughout this Chapter are described in Table 6.2 as per EPA,2022 Guidelines on the information to be contained in Environmental Impact Assessment Reports.

Table 6.2. Criteria Assessment of Potential Impacts Terminology and Methodology (Source: EPA, 2022)

Quality of Effects / Impacts	Definition
Negative	A change which reduces the quality of the environment
Neutral	No effects or effects that are imperceptible, within the normal bounds of variation or within the margin of forecasting error.
Positive	A change that improves the quality of the environment
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.

Quality of Effects / Impacts	Definition
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

6.5 Difficulties Encountered

There were no difficulties were encountered in the preparation of this Chapter of the EIAR.

6.6 Baseline Environment

6.6.1 Site Location and Surrounding Land Use

The site of the Proposed Development, which is 5.95 hectares (HA) in area, is located at Rathgowan, Mullingar, Co. Westmeath. The site is accessed via the existing entrance off the roundabout on the R394 Regional Road (known locally as the 'c-link' road) which adjoins the northwest boundary of the site.

The area surrounding the site is characterised by a mix of land uses. The site is bound to the northwest by the R394 or C-Link with agricultural land beyond, to the southwest the R393 (known locally as 'Ashe Road') and an ESB substation with b, and to the northeast and southeast by residential lands comprising two-storey detached and semi-detached dwellings.

The site location is presented in Figure 6.1.

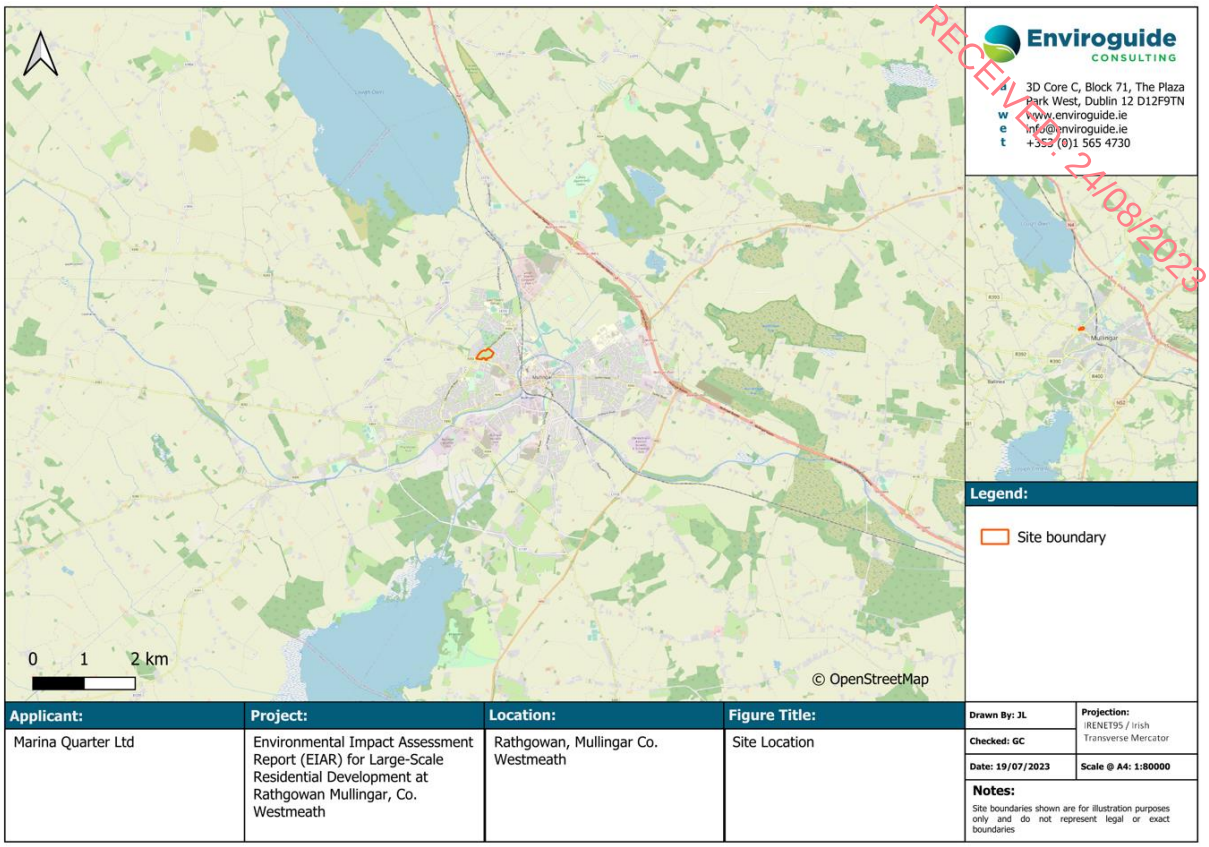

Figure 6.1. Site Location

6.6.2 Current Land Use

The primary land use at the site is currently agricultural farmland within two fields under grass pasture.

6.6.3 Topography

The site is relatively flat with gentle undulations and a slight sloping gradient to the northwest.

The topographic survey, presented in the site investigation report (IGSL, 2020) available in Volume 3 of this EIAR, identified that ground elevation across the site range from approximately 98.5m to 99m along the R394 at the northwest boundary of the site, rising to approximately 105mOD in the south-east corner of the site.

6.6.4 Soil and Geology

The soils and geology at the site are described and assessed in Chapter 5 of this EIAR and summarised as follows:

- The majority of the site is underlain by grey, brown Podzolics, brown Earths (medium-high base status) (IFS Soil Code: BminDW). A small area along the southwest boundary of the site is underlain by surface water Gleys, ground water Gleys (IFS soil code: BminPD).
- The quaternary sediments beneath the site are mapped by the GSI (GSI, 2023) as 'till derived from limestones' (TLs);

- The bedrock underlying the site is mapped as the Lucan Formation (GSI, 2023). The ground investigation (IGSL, 2020 included in Volume 3 of this EIAR) did not encounter bedrock (i.e., bedrock is greater than 5.7 mbGL); and
- There are no karst features within the site boundary or within a 2km radius of the site (GSI, 2023). The closest karst feature to the site is a spring located approximately 4.5km southeast of the site.

6.6.5 Rainfall

The soils and geology at the site are described and assessed in Chapter 5 of this EIAR and summarised as follows:

Monthly rainfall data available for 1km x 1km grids (for the period 1981 to 2010) was sourced from Met Éireann (Walsh, 2012) and is presented in Table 6.3.

Table 6.3 Long Term Mean Monthly Rainfall Data (Source: Walsh, 2012)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Long Term Avg.
94	71	78	66	70	75	73	88	80	107	90	97	990
Note: 1km x 1km Irish Grid Coordinates selected for the site of the Proposed Development = X (Easting): 243000, Y (Northing): 253000												

The closest synoptic meteorological station to the site is Mullingar station located approximately 0.78km northeast of the site. A summary of the long-term average potential evapotranspiration (PE) at Mullingar station for the period 2020-2023 (Met Éireann, 2023) is presented in Table 6.4.

Table 6.4 Average Potential Evapotranspiration (Source: Met Eireann, 2023)

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Long Term Avg.
10.3	17.4	31.0	51.4	71.9	80.5	79.1	65.0	44.0	22.9	10.3	7.5	491.3

The long-term average annual potential evaporation (PE) at the Casement Aerodrome is 491.3mm/year (refer to Table 6.4).

6.6.6 Regional Hydrogeology

6.6.6.1 Groundwater Body

The bedrock aquifer of the Lucan Formation beneath the majority of the site is reported to be within the Inny Groundwater Body (GWB) (EU Code: IE_SH_G_110), with a minor portion of the site (in the southwest corner) located within the Clara GWB (EU Code: IE_SH_G_240).

Groundwater flow paths in the Inny GWB will be short, in general between 30m and 300 m, with groundwater discharging locally to rivers and streams. The majority of groundwater flow is likely to

circulate in the upper tens of metres of bedrock, recharging and discharging in local zones. The dominant recharge process will be diffuse recharge from water percolating through the overlying tills and into the aquifer. Groundwater discharge will be local to the River Inny, located 12.5km northwest of the site at its closest point, and its tributaries (GSI, 2023).

Groundwater flow paths in the Clara GWB are generally short, on the order of 30m to 300m, with groundwater discharging to the streams and rivers that traverse the aquifer and to small springs. Local groundwater flows are determined by the local topography. There is no regional flow system in these aquifers. The majority of groundwater flow is likely to circulate in the upper 15m metres of the bedrock aquifer. The dominant recharge process will be diffuse recharge from water percolating through the overlying tills and into the aquifer. Groundwater discharge will be to gaining streams and rivers crossing the GWB (GSI, 2023).

Based on the topography, regional groundwater flow in the vicinity of the site of the Proposed Development is likely to flow in a north to northeast direction towards the River Brosna.

6.6.6.2 Recharge

The GSI groundwater recharge map provides an estimate of the average amount of rainwater that percolates down 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 what that enters the aquifer at points (e.g., sinkholes) or along linear fractures (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.

The GSI (GSI, 2023) have calculated an average annual capped recharge of 336mm/year for the aquifer beneath the site of the Proposed Development based on the effective rainfall (ER) value of 560mm/year and a recharge coefficient of 60%. The low recharge potential is due to the presence of low permeability subsoil beneath the site.

6.6.6.3 Aquifer Classification and Groundwater Vulnerability

The bedrock aquifer within the Lucan Formation beneath the site is classified by the GSI (GSI, 2023) as a Locally Important Aquifer (LI) which is moderately productive only in local zones. There are no reported gravel aquifers beneath or in the vicinity of the site (GSI, 2023).

The vulnerability categories, and methods for determination, are presented in the Groundwater Protection Schemes publication (DEHLG/EPA/GSI, 1999) and summarised in Table 6.5. 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 6.5 Vulnerability Mapping Criteria (Source: DEHLG/EPA/GSO, 1999)

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	Extreme	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 (GSI, 2023) has a assigned a groundwater vulnerability rating of 'High' (H) for the groundwater beneath the site. The anticipated depth to bedrock based on the low permeability subsoil encountered and the 'high' groundwater vulnerability rating is between 3mbGL and 5mbGL. It is noted that bedrock was not encountered during site investigations at the site to the maximum depth of drilling at 5.7mbGL. Therefore, a groundwater vulnerability rating of 'Moderate' (M) may be considered applicable to the site.

The bedrock aquifer classification and groundwater vulnerability rating maps are provided in Figure 6.2and Figure 6.3 respectively.

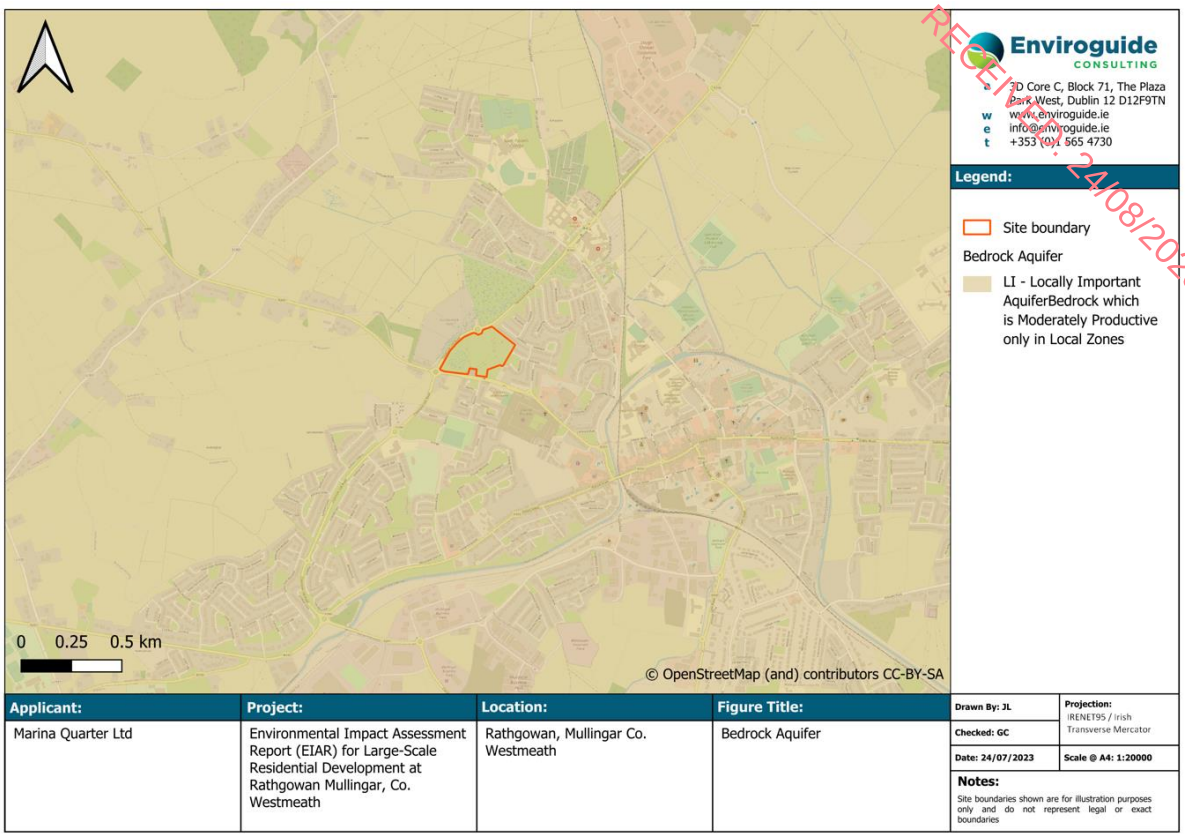

Figure 6.2 Bedrock Aquifer

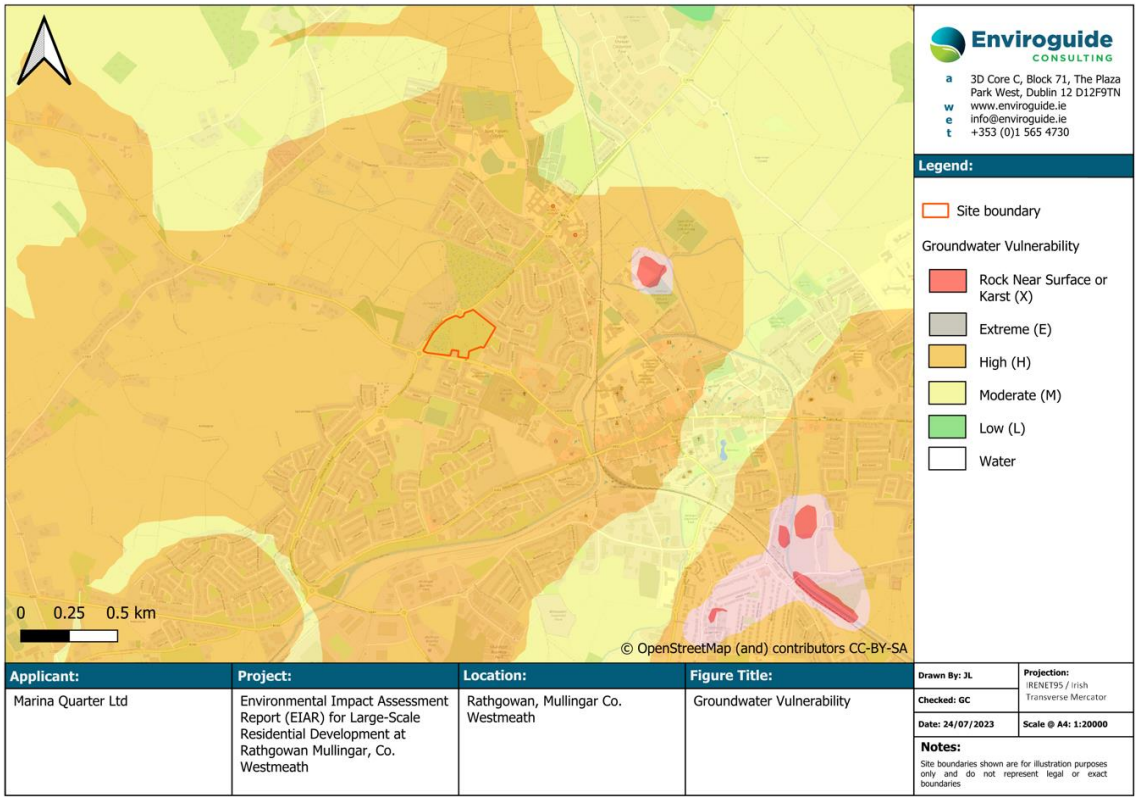

Figure 6.3 Groundwater Vulnerability

6.6.7 Site Hydrogeology

As documented in the ground investigation report (IGSL, 2020 included in Volume 3 of this EIAR), a groundwater strike at 95.46 meters above Ordnance Datum (mOD) / 4.2mbGL was recorded during drilling of borehole BH07. Groundwater was not encountered at remaining borehole and trial pit locations advanced across the site. However, groundwater strikes were also encountered at borehole locations BH02 (96.36mOD / 3.2mbGL)) and BH04(95.46mOD / 3.9mbGL) advanced within the lands to the west of the R394 Regional Road in Mullingar (i.e., Phase 3 of the larger development).

Based on the site topography (refer to Section 6.6.3) and the regional groundwater flow, groundwater flow likely is to the north / northeast towards the River Brosna.

As documented in the ground investigation report (IGSL, 2020 included in Volume 3 of this EIAR), infiltration tests were carried out at four locations (SA05 to SA08 at 1.5mbGL) in accordance with BRE digest 365 'Soakaway' design tests. Infiltration rates were recorded as 'low' (IGSL, 2020). The infiltrations test rate ranged from no infiltration to a maximum rate of 1.05 x 10-3 m/min (IGSL, 2020). The result indicates that the soil and subsoil is of low permeability with limited to no infiltration capacity from the ground surface to the underlying aquifer through the clay subsoils present on site.

6.6.8 Hydrology

The site is located within the Lower Shannon Water Framework Directive (WFD) Catchment (Catchment I.D.: 25A) and the Brosna_SC_010 sub-catchment (Sub-Catchment I.D.: 25A_10). There is a river sub-basin catchment divide at the very most southern corner of the site. The majority of the site is within the Brosna_020 river sub-basin (EU Code: IE_SH_25B090006) and the southeast corner of the site is within the Brosna_030 river sub-basin (EU Code: IE_SH_25B090100) (EPA, 2023). Therefore, flow from the site will ultimately be toward the Brosna River.

The EPA records a number of surface waterbodies with a potential hydraulic connection to the site of the Proposed Development including the following:

- The Brosna River (River Waterbody Code: IE_SH_25B090006) is located approximately 1.27km southeast of the site at its closest point. The Brosna River flows southwest before discharging into Lough Ennel (EU Code: IE_SH_25_188) located approximately 3.94km southwest of the site at its closest point.
- The Brosna North River (River Waterbody Code: IE_SH_25B280390) is located approximately 2.06km northeast of the site at its closest point. The Brosna North River flows southeast before converging with the Brosna River approximately 2.13km northeast of the site.
- The Farranistick Stream (River Waterbody Code: IE_SH_25B280390) is located approximately 1.18km northeast of the site at its closest point and flows north before converging with the Brosna North River approximately 2.06km north east of the site.
- The Irishtown 26 Stream (River Waterbody Code: IE_SH_25B280390) is located approximately 1.27km northeast of the site at its closest point and flows north before converging with the Brosna North River approximately 2.10km north east of the site.
- The Sarsanstown Stream (River Waterbody Code: IE_SH_25B090100) is located approximately 1.14km south of the site. The Sarsanstown Stream flows south before converging with the Brosna River approximately 2.93km south of the site.

- The Royal Canal Main Line (Lower Shannon) (EU Code: IE_25A_AWB_RCMLW) is located approximately 0.57km southeast of the site at its closest point.
- There are also a number of land drains in the area which were constructed as part of the Brosna Arterial Drainage Scheme under the 1945 Arterial Drainage Act. These land drains ultimately discharge to the Brosna River.

The surface water courses and relevant other water bodies to the site are presented in Figure 6.4.

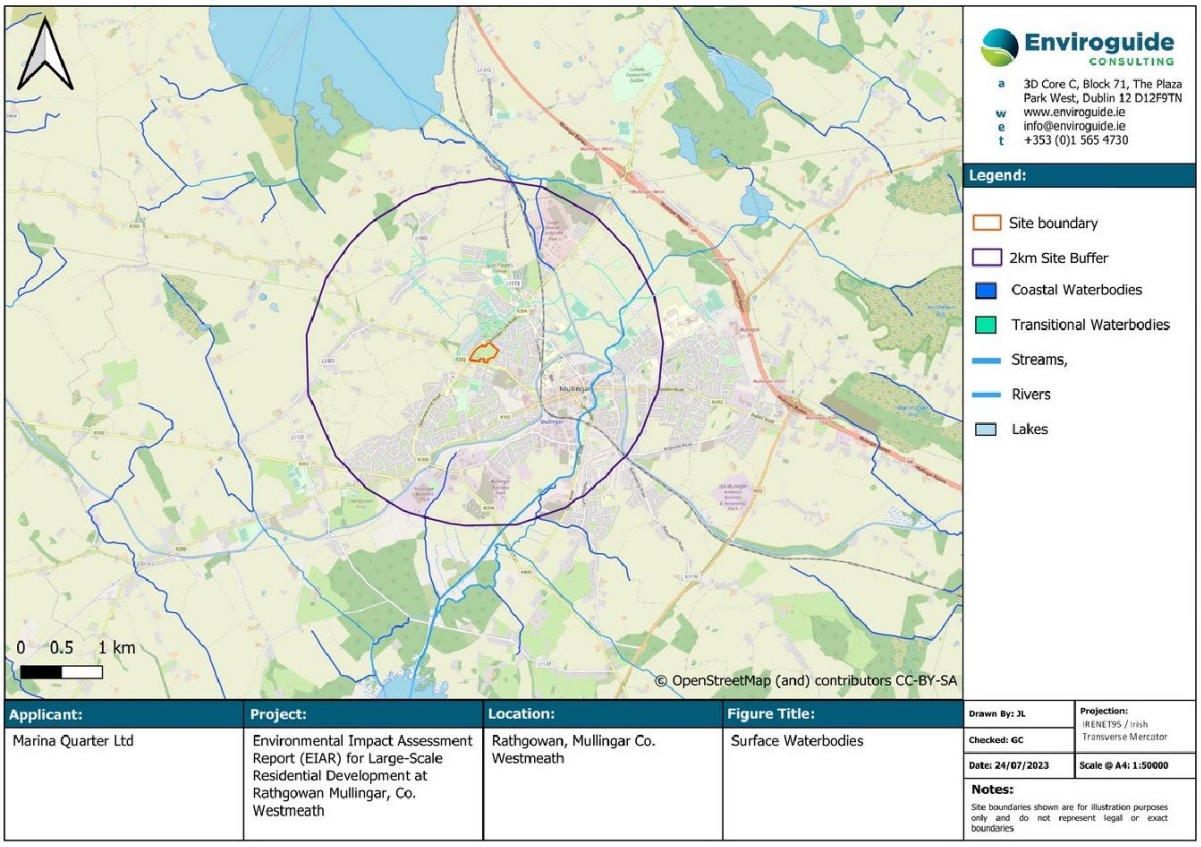

Figure 6.4 Surface Waterbodies within 2km of the site

6.6.8.1 Site Drainage

There is an existing 225mm UE foul sewer located within the site along the southwest boundary of the site. The foul water sewer is connected to the Mullingar WWTP (EPA Licence No. D0008-01) located approximately 1.28km south of the site. Treated effluent from the Mullingar WWTP ultimately discharges to Brosna River.

There are no other surface water drains, drainage ditches or watermains within the site boundary.

6.6.9 Flooding

The detailed flood risk assessment report (FRA) was produced (Tobin Consulting Engineers as included in Volume 3 of the EIAR Flood Risk Assessment - Phase 1 & 2 Residential Development at Rathgowan, Mullingar, County Westmeath; also included in Volume 3 of this EIAR) for the site and Proposed

Development which assessed the potential flood risk associated with fluvial, groundwater, coastal and pluvial flooding.

The FRA, which takes into account the impacts of climate change by allowing a 20% increase in rainfall intensities and flow and 0.5m sea level rise, concludes that the site is located in Flood Zone C where the risk of pluvial flooding to the Proposed Development is minimal, the risk of fluvial flooding is imperceptible and there is no risk of groundwater and coastal flooding.

6.6.10 Water Quality

6.6.10.1 Published Regional Surface Water Quality

The EPA surface water quality monitoring database was consulted and relevant data pertaining to the site was reviewed. There is available EPA water quality monitoring data published for the 'BROSNA - Mullingar- Canal Crossing' (Station Code: RS25B090010), the 'Mullingar: Indust Est Br' (Station Code: RS25B090040) and the 'Butler's Br' (Station Code: RS25B090100) located downstream of the site on the Brosna River (approximately 1.37km east, 1.46km southeast and 3.24km south of the site respectively). There is also available EPA water quality monitoring data published for 'Br SW of Culleen Beg on R394 (u/s Mgr STW)' (Station Code: RS25B280390) located upstream of the site on the Brosna North River (approximately 2.28km northeast of the site).

Table 6.6 EPA Surface Water Quality Data (Source: EPA, 2023)

River I.D.	Location	EPA WFD Parameter Quality & Trend Analysis				
		Parameter	Indicative Quality	Trend	Baseline Conc. (2018)	Q-Value (WFD Status)
Brosna North River (2.28km Upstream)	Br SW of Culleen Beg on R394 (u/s Mgr STW)	Ammonia – Total (as N)	Moderate	Upward	0.175	Poor (2-3) in 2021
		Orthophosphate (as P)- unspecified	Good	Downward	0.037	
Brosna River (1.37km East and Downstream)	BROSNA - Mullingar- Canal Crossing	Ammonia – Total (as N)	No Published Data Available			Poor (3) in 1993
		ortho-Phosphate (as P)- unspecified	No Published Data Available			
Brosna River (1.46km Southeast and Downstream)	Mullingar: Indust Est Br	Ammonia – Total (as N)	No Published Data Available			Poor (3) in 2021
		ortho-Phosphate (as P)- unspecified	No Published Data Available			
Brosna River (3.24km South and Downstream)	Butler's Br	Ammonia – Total (as N)	Good	Downward	0.039	Poor (3) in 2021
		ortho-Phosphate (as P)- unspecified	Moderate	Downward	0.046	

6.6.10.2 Published Regional Groundwater Quality

The EPA (EPA, 2023) 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 (EPA, 2023).

6.6.10.3 Receiving Water Quality – Mullingar

The most recent available Annual Environmental Report (AER) for Mullingar WWTP is 2022 (Irish Water, 2022). The AER identified the final effluent was compliant with the Emission Limit Values (ELV) specified in the discharge license (D0008-01). Importantly the 2022 AER notes:

'Based on ambient monitoring results a deterioration in Ortho-P concentrations downstream of the effluent discharge is noted.

A deterioration in water quality has been identified, however it is not known if it is or is not caused by the WWTP.

As per the 3rd Cycle Lower Shannon (Brosna) Catchment Report (HA 25A), the significant pressures on the At Risk Brosna_030 waterbody are Forestry and Urban Runoff. The Mullingar WWTP is not listed as a significant pressure in the Cycle 3 report.

The discharge from the wastewater treatment plant does not have an observable negative impact on the Water Framework Directive status.'

The Mullingar WWTP AER confirms the capacity of the plant will not be exceeded in the next three years.

6.6.11 Water Use and Drinking Water Source Protection

A review of the GSI wells and springs database (GSI, 2023) has identified one (1No.) groundwater well within a 2km radius of the site.

- Borehole (GSI Name: 2325SWW007) – Agri & Domestic Use with "Moderate" yield (65.5m3/day) located approximately 1.93km northwest of the site.

The site is located within an area serviced by mains water supply and there were no groundwater sources identified at the site during the site walkover.

The location of the groundwater sources recorded by the GSI (GSI, 2022) in the vicinity of the site is presented in Figure 6.5.

There are no mapped Groundwater Source Protection Areas (SPAs) located within a 2km radius of the site. The groundwater SPA is the Toberdaly Public Water Supply (PWS) 'outer protection area', located 21.6km southeast of the site.

There are no surface water drinking water sources, under Article 7 of the Water Framework Directive, identified by the EPA (EPA, 2022) within a 2km radius of the site. The closest surface water drinking water source to the site is identified by the EPA (EPA, 2023) as Lough Owel (EE Code: IE_SH_26_703) located approximately 2.84km northwest of the site. Lough Owel is the main source of drinking water for the town of Mullingar and surrounding areas. Lough Owel is groundwater fed and forms part of a

complex hydrological setting, where water levels on the lake cannot fall below 98.90 m O.D (as per the Lough Owel abstraction licence requirements). The lake also is linked to a feeder canal to the Royal Canal pNHA (Irish Water, 2021).

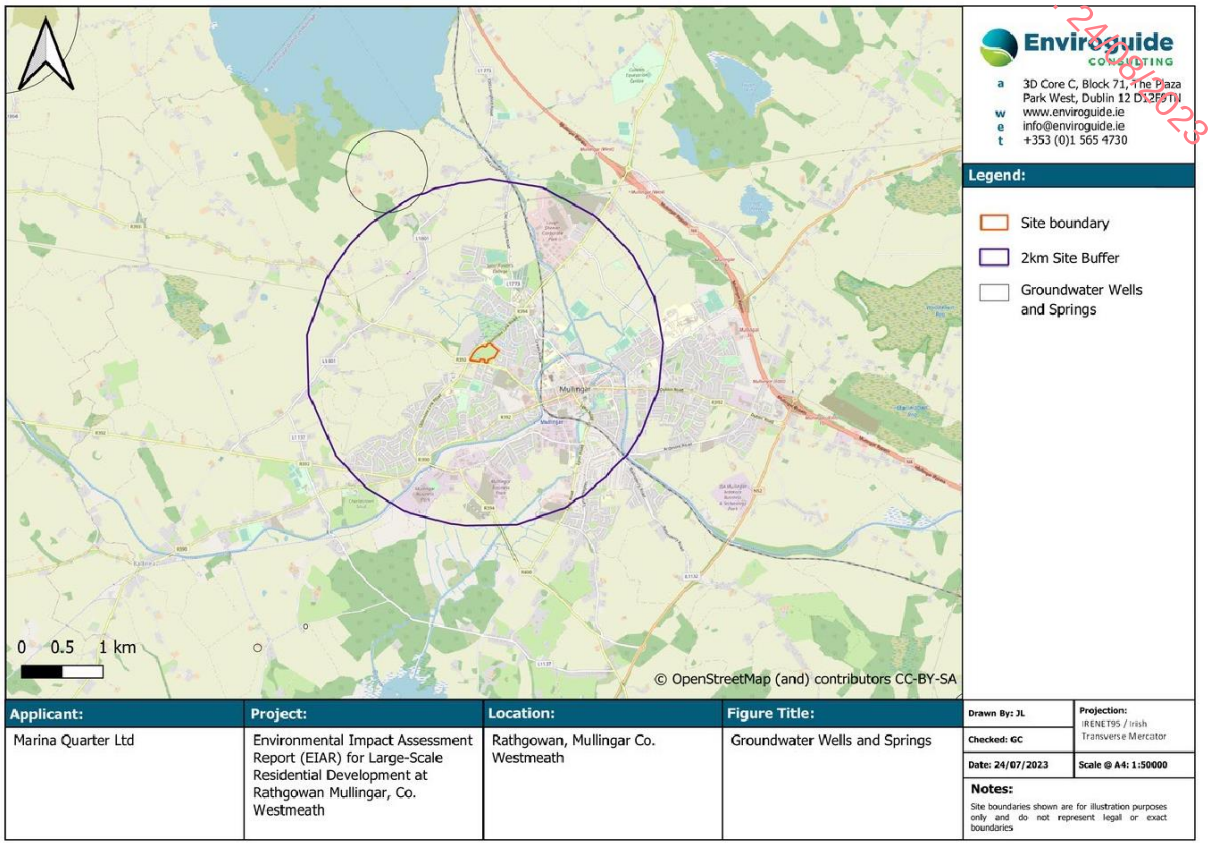

Figure 6.5. Groundwater Wells and Springs

6.6.12 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, 2023) in accordance with European Communities (Water Policy) Regulations 2003 (SI no. 722/2003) are provided in Table 6.7 and presented in Figure 6.6.

It is noted that the Farranistick Stream and the Irishtown 26 Stream are part of the Brosna_010 WFD waterbody.

Table 6.7 WFD Risk and Waterbody Status (Source: EPA, 2023)

Waterbody Name	Water body; EU code	Location from Site	Distance from Site (km)	WFD water body status (for the period of 2016-2021)	WFD 3rd cycle Risk Status	Hydraulic Connection to the Site
Surface Water Bodies						
Brosna_010	IE_SH_25B28 0390	Northwest	1.18	Poor	At Risk	No, upstream of the site
Brosna_020	IE_SH_25B09 0006	Southeast	1.27	Poor	At Risk	Yes, downstream of the site
Brosna_030	IE_SH_25B09 0100	Southeast	1.53	Poor	At risk	Yes, downstream of the site
Brosna_040	IE_SH_25B09 0200	South	3.25	Moderate	At risk	Yes, downstream of the site
Lake Water Bodies						
Ennell	IE_EA_09L012 360	South	3.94	Good	Review	Yes, downstream of the site
Groundwater Bodies						
Inny	IE_SH_G_110	Underlying	n/a	Good	Not at Risk	Yes, underlying the majority of the site
Clara	IE_SH_G_240	Underlying	n/a	Good	Not at Risk	Yes, underlying the southwest corner of the site

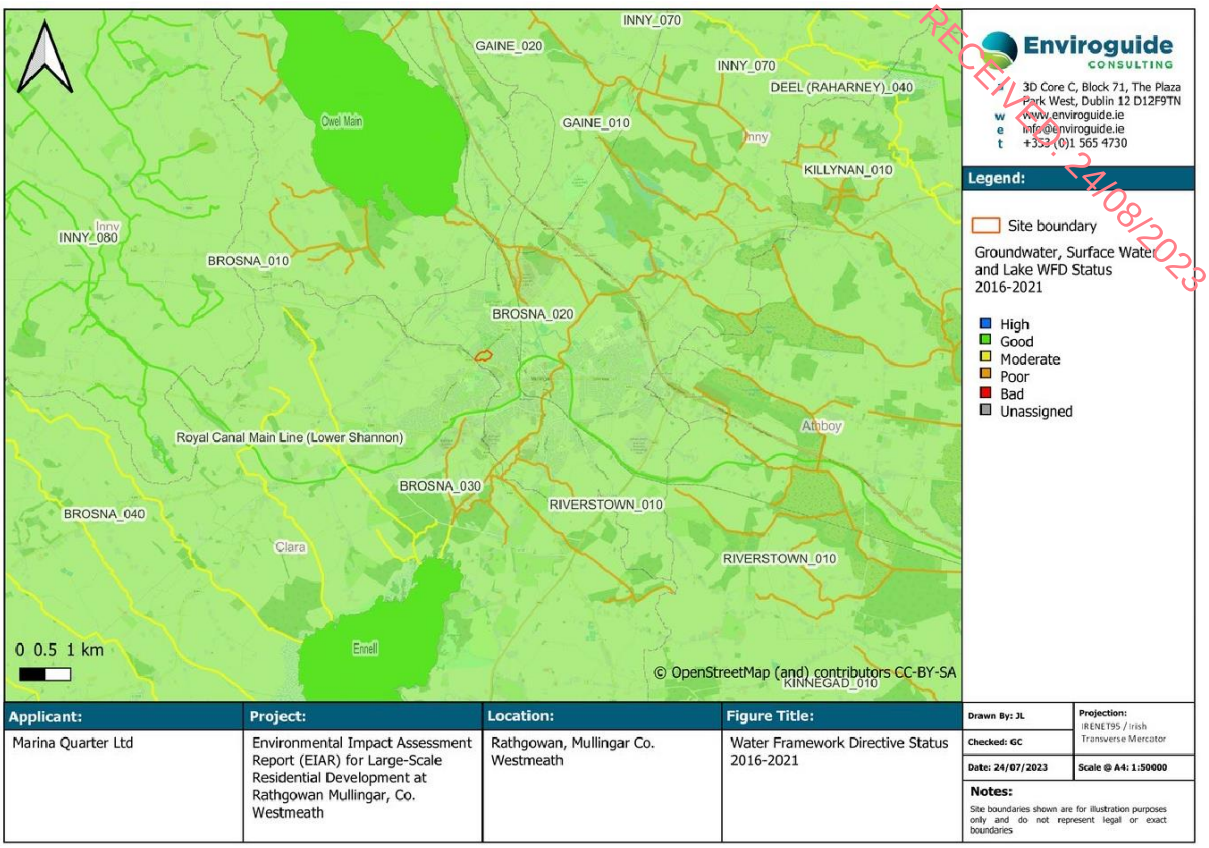

Figure 6.6. WFD Waterbody Status

6.6.13 Designated and Protected Sites

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).

There are ten (5No.) sites located within a 15km radius of the site that are identified as SACs and five (5No.) sites that are identified as SPAs. There are also six (6No.) Natural Heritage Areas (NHA) and eight (8No.) proposed NHAs (pNHA).

The SACs, SPAs, , NHAs, and pNHAs with a potential hydraulic connection with the Proposed Development are highlighted in Table 6.8 and presented in Figure 6.7.

Chapter 8 (Biodiversity) of this EIAR provides further details regarding the designated and protected sites. For the purposes of this assessment, the closet hydraulically connected natura 2000 sites are considered to be Lough Ennell SAC (Site Code: 000685) and Lough Ennell SPA (Site Code: 004044).

Table 6.8. Designated and Protected Sites (Source: NPWS, 2023)

Site Name (Site Code)	Distance to the Site	Hydraulic Connection to the Site
Special Area of Conservation		
Lough Owel SAC (000688)	2.84km northwest	No identified hydraulic connection. It is noted that Lough Owel is the main source of drinking water for the town of Mullingar and surrounding areas.
Garriskil Bog SAC (000679)	14.00km northwest	No identified hydraulic connection.
Wooddown Bog SAC	5.20km east	No identified hydraulic connection.
River Boyne And River Blackwater SAC	13.00km east	No identified hydraulic connection.
Lough Ennell SAC (000685)	3.94km south	Yes, will receive surface water flow from the site via the Brosna River.
Split Hills and Long Hill Esker SAC (001831)	17.07km southwest	Yes, will receive surface water flow from the site via the Brosna River ad Lough Ennel. However, given the distance from the site significant dilution will occur.
Special Protection Areas (SPA)		
Lough Owel SPA (004047)	2.84km northwest	No identified hydraulic connection. It is noted that Lough Owel is the main source of drinking water for the town of Mullingar and surrounding areas.
Lough Iron SPA (004046)	8.96km northwest	No identified hydraulic connection.
Garriskil Bog SPA (004102)	14.00km northwest	No identified hydraulic connection.
Lough Derravaragh SPA (004043)	7.80km northwest	No identified hydraulic connection.
Lough Ennell SPA (004044)	3.94km south	Yes, will receive surface water flow from the site via the Brosna River.
Natural Heritage Areas (NHA)		
Lough Garr NHA (001812)	14.10km northwest	No identified hydraulic connection.
Garriskil Bog NHA (000679)	14.00km northwest	No identified hydraulic connection.
Lough Derravaragh NHA (000684)	7.80km northwest	No identified hydraulic connection.
Nure Bog NHA (001725)	10.20km southwest	No identified hydraulic connection.
Wooddown Bog NHA (000694)	4.09km east	No identified hydraulic connection.
Cloncrow Bog (New Forest) NHA (000677)	14.7km south	No identified hydraulic connection.
Proposed Natural Heritage Areas (pNHA)		
Royal Canal pNHA (002103)	0.55km east	Yes, located within Inny and Clara GWB. While there are no surface water pathways, there is a potential for groundwater discharge.

Site Name (Site Code)	Distance to the Site	Hydraulic Connection to the Site
Walshestown Fen pNHA (001731)	3.06km west	No identified hydraulic connection.
Lough Sheever Fen/Slevin's Lough Complex (000690)	3.06km northeast	No identified hydraulic connection.
Lough Owel pNHA (000688)	2.84km northwest	No identified hydraulic connection. It is noted that Lough Owel is the main source of drinking water for the town of Mullingar and surrounding areas.
Lough Iron pNHA (000687)	8.96km northwest	No identified hydraulic connection.
Scragh Bog pNHA (000692)	4.87km northwest	No identified hydraulic connection.
Ballynafid Lake And Fen pNHA (000673)	6.52km northwest	No identified hydraulic connection.
Lough Ennell pNHA (000685)	3.94km south	Yes, will receive surface water flow from the site via the Brosna River.

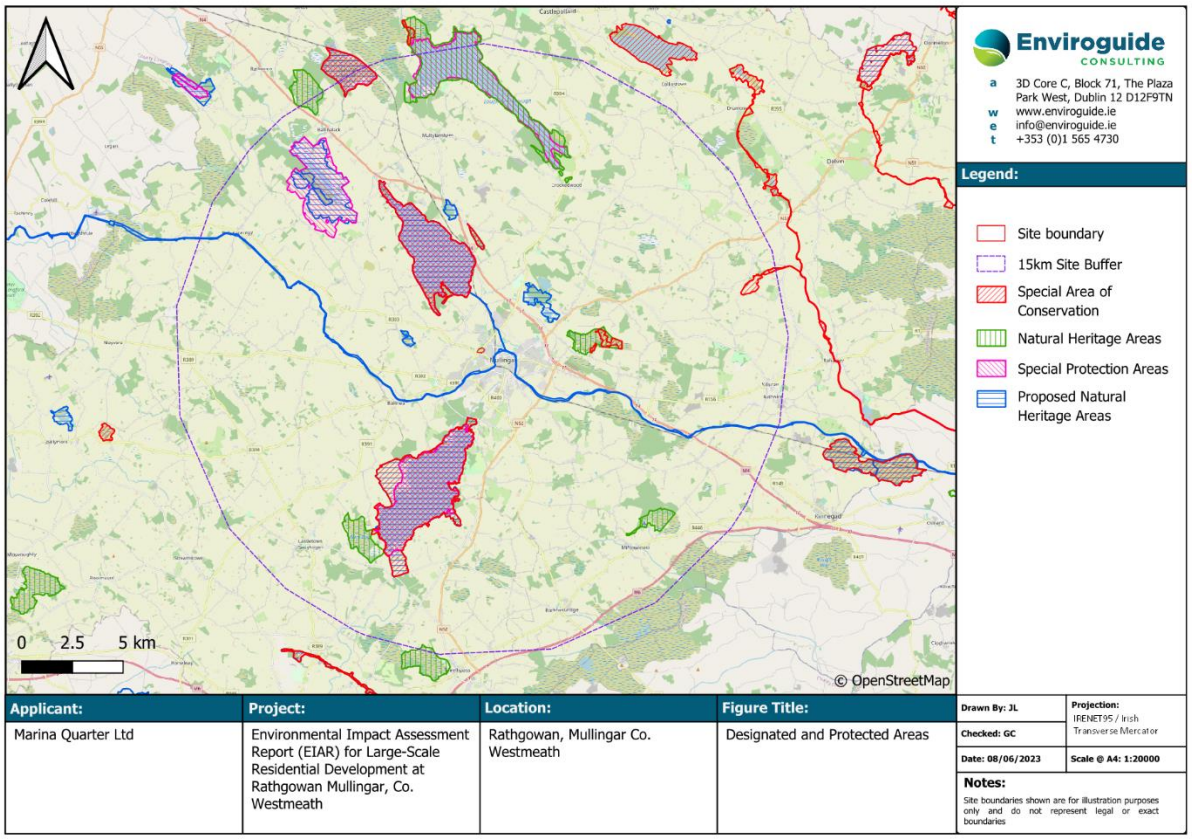

Figure 6.7. Designated and Protected Sites

6.6.14 Summary of Receiving Environment

The site of the Proposed Development comprises undeveloped lands sloping gently to the northwest.

The site is located within the Brosna_SC_010 sub-catchment. The closest surface water feature to the site is the Brosna River located approximately 1.27km southeast of the site at its closest point. The Brosna River flows southwest before discharging into Lough Ennel approximately 3.94km southwest of the site at its closest point.

The soils beneath the site are mapped as having 'low' permeability. The subsoils are mapped as 'till derived from limestones'. The ground investigation (IGSL, 2020 included in Volume 3 of this EIAR) encountered silt / clay to the maximum extent of investigation (up to 5.7mbGL). Bedrock was not encountered (i.e., the depth to bedrock is greater than 5.7 mbGL) is mapped by the GSI (GSI, 2023) as the Lucan Formation.

The Lucan formation is classified by the GSI (GSI, 2023) as a Locally Important Aquifer (LI) which is moderately productive only in local zones. The aquifer beneath the majority of the site is reported to be within the Inny GWB, with a minor portion of the site (in the southwest corner) located within the Clara GWB.

The GSI (GSI, 2023) has a assigned a groundwater vulnerability rating of 'High' (H) for the groundwater beneath the site. However, given that the depth to bedrock across the site is greater than 5.7mbGL, it is considered that a groundwater vulnerability rating of 'Moderate' (M) may be considered applicable to the site where the depth to bedrock is expected between 5mbGL and 10mbGL.

The recharge coefficient for rainfall to site is 60%.. The majority of rainfall to the site will discharge to the drains on site as overland flow, the drainage channels are connected to the Brosna River.

The GSI (GSI, 2023) have calculated an average annual capped recharge of 336mm/year for the aquifer beneath the site due to the presence of low permeability subsoil beneath the site. The majority of rainwater across the site will percolate through the overlying tills and into the aquifer before discharging to streams and rivers crossing the GWBs. Based on the topography, regional groundwater flow in the vicinity of the site of the Proposed Development is likely to flow in a north to northeast direction towards the Brosna River.

There is only one (1No.) groundwater source (agricultural and domestic use) identified within a 2km radius of the site (GSI, 2023).

The WFD Status has been assigned as 'good' for the underling Inny GWB and Clara GWB. The WFD status has been assigned as 'poor' to moderate for the Brosna River downstream of the site (i.e., the Brosna_010 though Brosna_040) and 'good' for Lough Ennel to which the Brosna River discharges.

The closet hydraulically connected Natura 2000 sites are considered to be Lough Ennell SAC (Site Code: 000685) and Lough Ennell SPA (Site Code: 004044).

6.6.15 Importance of Receiving Environment

In accordance with Table 6.1 and taking account of the receiving hydrological and hydrogeological environment, the importance of the site is considered to be of "medium" importance given that the bedrock aquifer of the Lucan Formation is classified as a Locally Important Aquifer (LI) and considering there is only one recorded water well within a 2km radius of the site (i.e., potable water is supplying less than 50 homes).

6.7 The 'Do nothing' Scenario

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 and site walkover to assess the degree to which these receptors will be impacted upon in the absence of mitigation.

If the Proposed Development did not proceed the site would remain as undeveloped lands. There would be no change to the drainage at the site or to the hydrological and hydrogeological regime at the site.

6.8 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 and site walkover to assess the degree to which these receptors will be impacted upon in the absence of mitigation.

The assessment will identify the likely impacts during the Construction Phase and Operational Phase of the Proposed Development. This will involve assessing the significance of any potential effects by determining the sensitivity of the receptors and the magnitude of the potential effect.

6.8.1 Construction Phase

Hydrogeological Flow Regime

While dewatering to lower groundwater levels in the aquifer is not anticipated, there may be a requirement for sump dewatering of localised shallow groundwater to enable working in dry excavations, any drawdown which will occur is considered to be localised in the immediate area surrounding excavations and temporary.

During the Construction Phase, soil and subsoils will be exposed and excavated with temporary increased potential for infiltration of rainfall to the underlying aquifer. This will be reduced over the course of the construction of the Proposed Development with an overall increase in impermeable areas and reduced infiltration potential. Infiltration tests carried out across the site indicate 'low' infiltration potential. Overall, it is considered that the impact of the Proposed Development on the hydrogeological regime within the aquifer will be 'neutral' 'imperceptible' and 'permanent'.

Water Quality

Sources of contamination that could impact on water quality from the construction of the Proposed Development include:

- Storage and use of fuels, oils and chemicals used during the construction which in the event of an accidental release could infiltrate the underlying groundwater or migrate via surface water runoff to offsite water bodies;

- Use of concrete and cementitious materials or other potential hazardous material during the construction in particular for below ground structures and foundations where shallow groundwater may be encountered;
- Accidental release of wash-water or foul water from facilities at the site (e.g., wheel wash and temporary welfare facilities); and
- Release of foul water from existing foul water drainage during connection to live sewers.

The potential pathway and pollutant linkages for the construction phase are identified as:

- Infiltration of contaminated to the substrate and bedrock aquifer via potential conduits introduced through groundworks;
- Infiltration through subsoils during excavation where the groundwater vulnerability is increased (i.e., the thickness of low permeability materials is reduced this there is a more direct pathway for surface contaminates to underlying bedrock aquifer)
- Lateral migration within the bedrock aquifer; and
- Discharge of water (groundwater/ surface water runoff) to sewer, watercourses, or groundwater in accordance with all statutory requirements and obligations. Unauthorised discharge of water during the construction phase of the Proposed Development will not be permitted.

The potential receptors from the subject site include:

- Underlying Lucan Formation bedrock aquifer which is part of the Inny and Clara GWBs
- The land drains constructed as part of the Brosna Arterial Drainage Scheme;
- The Brosna River, Lough Ennel and downstream receiving waterbodies;
- The Royal Canal Main Line; and
- Groundwater users.

There is only one (1No.) groundwater user identified within a 2km radius of the site, which is located c. 1.93km to the northwest. The groundwater flow direction beneath the site is considered to be to the north/northeast. Both the Inny GWB and the Clara GWB beneath the site are considered to have short groundwater flow paths (in the order of 30 to 300m), with groundwater discharging to nearby streams, rivers (Inny GWB and Clara GWB) and springs (Clare GWB only). Therefore, there is no perceived pathway from groundwater beneath the site to the identified groundwater user and thus this receptor is not considered further.

The Royal Canal Main Line is not hydraulically connected to the site and thus this receptor is not considered further.

There is a potential risk to the underlying bedrock aquifer due to any accidental release deleterious materials (e.g., fuels, cementitious material or other hazardous materials), through the failure of secondary containment or a materials handling accident at the site, to exposed granular subsoils which may create a direct pathway to the bedrock aquifer. The groundwater vulnerability will temporarily be increased during the 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 the receiving hydrogeological and hydrological environment depending on the nature of the incident.

There is a risk of contamination entrained in surface water run-off entering the land drains to the north of the site, discharging to the Brosna River, and tracking downstream. In the absence of mitigation measures, there is a potential 'negative' 'significant' and 'long term' impact on the receiving waterbodies including the Clare and Inny GWB, the Land Drains and the Brosna River. Based on the distance downstream and dilution which will occur in the land drains and Brosna River, there is no perceived risk to downstream waterbodies including the Lough Ennel.

The appointed contractor ensures that any run-off from the site or any areas of exposed soil will be managed as required with temporary pumping. Dewatering of excavation is not anticipated however where water must be pumped from 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 licences issued by UE under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from WCC 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 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', 'negligible' and 'temporary' impact on the receiving water environment.

The appointed Contractor will ensure that any run-off from the site will be managed for the duration of the Construction Phase to ensure that surface water runoff is contained, attenuated and treated onsite prior to discharge to surface water / groundwater.

6.8.2 Operational Phase

Hydrogeological Flow Regime

The site is currently undeveloped greenfield lands. The construction of the Proposed Development will convert a percentage of the surface to impermeable surfaces due to the construction of buildings, roads and other infrastructure.

Infiltration tests carried out across the site indicate 'low' infiltration potential. The SuDS measures adopted across the site will allow discharge of surface water run-off from the site to ground. Thus, the overall change in recharge to the underlying aquifer will be negligible. Overall, it is considered that the impact of the Proposed Development on the hydrogeological regime within the aquifer will be 'neutral' 'imperceptible' and 'permanent'.

Drainage and Flood Risk

The Civil Works Design Report (Tobin Consulting Engineers, 2023c as included in Volume 3 of the EIAR) noted that the surface water drainage at the Proposed Development has been designed in accordance with principles of Sustainable urban Drainage Systems (SuDS) as embodied in the recommendations of the Greater Dublin Strategic Drainage Study (GDSDS) 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; and

- Criterion 4 – River Flood Protection

The FRA (Toban Consulting Engineers, 2023d as included in Volume 3 of this EIAR) identifies that while the site is located within Flood Zone C where the risk of flooding is low and the Proposed Development will not result in displacement of any potential flood waters, will not obstruct important flow paths and will not adversely impact on the hydrological regime of the area or increase flood risk elsewhere.

Therefore, it is considered that the potential flooding impacts associated with the Proposed Development will be 'neutral', 'imperceptible' and 'long-term'.

Water Quality

There will be no significant sources of contamination at site during the Operational Phase of the Proposed Development.

There will be no bulk storage of petroleum hydrocarbon- based fuels or other hazardous materials during the Operational Phase.

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 Civil Works Design Report (Tobin Consulting Engineers, 2023c as included in Volume 3 of the EIAR), prior to discharging to the surface water network for the approved Phase 3 residential development (Planning Reference No. 22/515) located along the R394-C Link Road and ultimately the Brosna River via the Brosna Arterial Drainage Scheme land drains identified to the north of the site, all surface water runoff will pass through a treatment train including natural based SuDs (i.e. water butts, rain gardens, infiltration trenches, permeable paving and soakaways etc. as detailed in Section 6.3.1.2) and proprietary system SuDS (i.e., by-pass interceptor). Therefore, it is considered that there will be a 'neutral', 'imperceptible', 'long-term' impact on to the quality of receiving hydrological receptors including the Brosna River.

However, In the worst-case scenario of accidental spillage from a car engine and failure of SuDS there is a potential risk to water quality in the receiving environment. In the absence of mitigation measures, there is a potential 'negative', 'moderate' and 'medium term' impact on the quality of the receiving water environment depending on the nature of the incident.

Foul water from the site will ultimately be treated at the Mullingar WWTP. The WWTP is operated under existing statutory consents and the most recent available data in the 2022 AER verifies that discharge from the WWTP was compliant. Foul water from the Proposed Development will only be discharged to public sewer under agreement from UE and other applicable statutory consents verifying capacity at the WWTP for the Proposed Development. Therefore, on the basis that the foul effluent from the Proposed Development will be treated to the required standard in accordance with relevant statutory consents, it is considered that there will be a 'neutral', 'imperceptible', 'long-term' impact on receiving water quality associated with the discharge of foul water from the Proposed Development. Furthermore, as noted in the 2022 AER and detailed in section 6.6.10.3, the discharge of treated effluent from the Mullingar WWTP will have no observable negative impact on the receiving WFD status.

6.8.3 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.

A search of planning applications located within a 2km radius of the Proposed Development was conducted using online planning resources including the National Planning Applications Database (MyPlan.ie) and Westmeath County Council's online planning database. Any planning application listed as granted, application registered or application pending from within the last five years were assessed for their potential to act in-combination with the Proposed Development and cause likely significant effects on hydrology and hydrogeology. The larger-scale developments identified within the vicinity of the site of the Proposed Development and considered for potential cumulative effects are listed in Table 6.9.

Table 6.9: Planning Applications in the Vicinity of the Site

Planning reference	Location relative to the Proposed Development	Development description
22515	North of the C-Link Road	Permission for the following Large-Scale Residential Development comprising of the construction of 213 no. residential units, 1 no. creche, 1 no. pumping station and all associated ancillary development works including 2 no. ESB sub-stations, footpaths, cycle lane, car and bicycle parking, drainage, bin storage, landscaping/amenity areas and the undergrounding of existing 38KV overhead electricity lines at Rathgowan, Mullingar, Co. Westmeath. Access will be via the existing roundabout on the R394 (C-Link). This development will form Phase 3 of a larger (three-phase) residential development at this location.
Part 8 Application	0.3km east of the Proposed Development.	Part 8 application for the construction of 22 no. dwelling units adjacent to Ashfield/Abbeylands/Green Road and St. Bridget's Terrace, Mullingar, Co. Westmeath.
Part 8 Application	2km east of the Proposed Development	The construction of 17 no. dwelling units on a site at the junction of Delvin & Robinstown Road, Springfield TD, Mullingar, Co. Westmeath.
Part 8 Application	0.8km south of the Proposed Development.	The construction of 15 no. single storey houses on four separate sites at Ennell Court and Trinity Cottages, Mullingar, Co. Westmeath.
Part 8 Application	1.3km east of the Proposed Development.	Proposed Housing Development of 32 no. dwelling units consisting of 19 no. 2 bed units and 13 no. 1 bed units at Friar's Mill Road / Canal Avenue, Mullingar, Co. Westmeath.
21568	0.6 km northwest of the Proposed Development.	An extension of duration was sought for 16/6001: planning reference no: 11/5121 for the construction of a new housing development, consisting of 28 no. houses to be constructed in 3 phases made up of a combination of 26 no. detached 2 storey houses (as per condition no.5 of outline permission planning ref. no. 11/4121) with associated services.

Planning reference	Location relative to the Proposed Development	Development description
196159	This site lies 1.8km south of the Proposed Development.	Planning permission was sought for the construction of 98 no. residential units consisting of 14 no. 2 bed terraced houses, 10 no. 3 bed end-terraced houses, 12 no. 3 bed semi-detached houses, 8 no. 4 bed semi-detached houses and 54 no. duplex units (comprising 27 no. 1 bed units and 27 no. 3 bed units). Provision of a creche and community facility, 142 no. car parking spaces, 8 no. motorcycling spaces and 102 no. bicycle spaces. Access from the R390. All site development and servicing works, bin stores, ESB substation, pumping station, open space, landscaping and boundary treatments.
196121	Directly east of the Proposed Development.	Planning permission was sought for the construction of 18 Apartment units in 2 Blocks (Block A & B). Block A consists of 1 no. 1 bedroom units, 3 no. 2 bedroom units and 2 no. 3 bedroom duplex apartment units in 2 and 3 storey high building with private balconies and patios. Block B consists of 6 no. 1 bedroom units and 6 no. 2 bedroom duplex apartment units in 3 storey high building with private balconies and patios. The Proposed Development will also consist of a new site entrance, shared access road, footpaths, car parking spaces, boundary wall and fence, covered cycle rack, recycling bin storage area, public and private open spaces, partial removal and trimming of existing hedgerows to accommodate proposed site entrance, landscaping and all associated site works and services.

Water Resources:

The Proposed Development will be connected to the existing UE 400mm Asbestos watermain located within the R394 C-Link Road and to the existing UE 100mm uPVC watermain located within Ashe Road subject to agreement with UE. The UE COF dated the 3rd August 2023 states that the water supply connection is feasible subject to upgrades, which will be completed as part of the construction of the Proposed Development. The mains water supply is operated in accordance with relevant existing statutory consents and therefore there will be no cumulative impacts associated with the Proposed Development on the supply network and water resources.

Water Quality

As outlined in the Civil Design Report (Tobin Engineering Consulting 2023 provided in volume 3 of this EIAR). The UE CoF letter dated the 3rd of August 2023 states that the foul water connection is feasible. As documented in the Civil Design Report (Tobin Consulting Engineers 2023c included in Volume 3 of this EIAR) foul water from the Proposed Development will be pumped via the pump station previously granted planning by WCC (Planning Reference No. 22/515) to a 110mm PE rising main on the R394 C-Link Road before discharging to the existing UE 525mm foul sewer. Thereby meeting the UE requirements outlined in the UE CoF letter (Ref: CDS23002571). The Mullingar WWTP is operated with relevant statutory approvals and the available 2022 AER indicates that discharges from the WWTP were compliant with the ELVs specified in the discharge license. Therefore, there will be no identified impact on the receiving environment associated with foul discharges from the Proposed Development via Mullingar WWTP individually or in-combination.

There will be no cumulative impacts on the receiving surface water environment in terms of water quality and flood risk associated with surface water runoff from the Proposed Development and considered offsite developments.

There are no other potential cumulative impacts associated with the Proposed Development.

6.9 Mitigation

The mitigation measures, as outlined below, will ensure that there will be no significant impact on the receiving groundwater and surface water environment. 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 2012 (SI No 327 of 2012), and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016).

6.9.1 Construction Phase Mitigation

A preliminary Construction Environmental Management Plan (CEMP) has been prepared by Tobin Consulting Engineers (Tobin Consulting Engineers, 2023a). Following appointment, the contractor will be required to implement the measures set out CEMP and maintain environmental monitoring records for the duration of the project which shall be made available to representatives from Westmeath County Council for inspection on request. The CEMP is considered as a 'Live Document' and will be updated accordingly throughout the project as required.

Mitigation works will be adopted as part of the construction works for the Proposed Development. The measure will address the main activities of potential impact which include:

- Control and Management of water and surface runoff;
- Control of Management of works nears water courses;
- Control of Management of materials from off-site sources;
- Appropriate fuel and Chemical handling, transport and storage; and
- Management of accidental release of contaminants at the subject site.

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); and

- 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 construction phase of the Proposed Development.

All run-off from the subject site or any areas of exposed soil will be managed as required with temporary pumping and following appropriate treatment as required. Dewatering to lower groundwater levels is not anticipated. However, where surface water runoff must be pumped from excavations, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the CEMP and regulatory consents to minimise the potential impact on the local groundwater flow regime within the soil and bedrock.

Unauthorised discharge of water (groundwater / surface water runoff) to ground, drains or watercourses will not be permitted. works. The appointed Contractor will ensure that the discharge of water to ground, drains or watercourses will be in accordance with the necessary discharge licences issued by UE under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from Westmeath County Council under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water.

A buffer zone of 30m will be maintained between onsite drains of open water located on the site and any stockpiles of loose materials pending re-use onsite. Silt fences will be erected at the toe of stockpiles to prevent run-off. The silt fences will be monitored daily by the main contractor and silt will be removed from required.

A regular review of weather forecast will take place, insofar as possible, ground excavation works will be scheduled during period of dry weather to minimise potential for silt laden run-off.

Handling of Fuels and Hazardous Materials

Fuelling and lubrication of equipment will be carried out in a designated areas of the site away from any existing manholes or gullies. Fuelling and lubrication of equipment will only be carried out in a designated area of the site away from any existing manholes or gullies. At present, it is proposed that fuel and lubricants will be stored adjacent to the office compound.

Bunds will have regard to Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013c). 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.

This bunded area will be roofed appropriately to exclude rainwater. Mobile fuel bowsers may be used for refuelling heavy equipment. Bowsers used will be double skinned and spill kit/drip tray equipment will be used during refuelling which will take place away from any nearby drains or watercourses and from any surface water drainage gulley's (Tobin Consulting Engineers, 2023a).

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.

As outlined in the CEMP (Tobin Consulting Engineers, 2023a), 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.

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 Contractor and in accordance with the CEMP (Tobin Consulting Engineers, 2023a) and relevant industry standards.

All ready-mixed concrete will be delivered to the site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite.

A suitable risk assessment for wet concreting shall be completed prior to works being carried out.

Emergency Procedures

In the event of an environmental incident, the appointed Project Environmental Manager will be notified immediately, and absorbent materials used to prevent the spread of the spill/leak. The contaminated materials will be transferred to leak-proof storage containers and any contaminated soils or gravels excavated and removed off-site. A record of the incident will be kept, and Westmeath County Council will be notified.

Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

- Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site;
- Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants;
- Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained;
- In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the site and compliantly disposed 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 for in the event of accidental fuel spillages; and
- All construction works staff on-site will be fully trained on the use of equipment.

This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving hydrology and Hydrogeology 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. Portaloos will be provided in the compound initially, with a dedicated toilet block installed later. 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.

6.9.1.1 Monitoring

During the 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 that are protective of water quality are fully implemented and effective.
- Discharges to surface water / foul sewers will be monitored where required in accordance with statutory consents (i.e., discharge licence).
- Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with avoidance, remedial and mitigation measures.

6.9.2 Operational Phase Mitigation

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 of the receiving environment.

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.

With regard to the Proposed discharge of treated operational surface water from the Proposed Development the land drains eventually discharging to the Brosna River waterbody, the potential for surface water generated at the Proposed Development to cause significant effects to downstream sensitivities during the operational phase would be considered negligible due in part to the SuDS measures and petrol interceptor incorporated in the overall design.

6.9.2.1 Monitoring

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.

6.10 Water Framework Directive

There are identified potential impacts on the water quality associated with the Proposed Development in the absence of avoidance, remedial and reductive measures that could impact on the WFD Status of the receiving water bodies, taking account of a wors-case scenario.

The Potential impact on WFD status for water bodies was assessed based on the worst-case scenario, taking account of the baseline hydrological and hydrogeological conditions at the site, the WFD Status assigned by the EPA (EPA, 2023) to the waterbodies namely the Brosna River (Brosna_010 to Brosna_040), the Ennell lake waterbodies and the Inny and Clara groundwater bodies.

In the absence of mitigation measures, there could be a 'negative', 'significant' and 'long-term' impact to the WFD status or the potential to achieve 'good; status of the Brosna River waterbody. Taking account of the distance downstream and the dilution which will occur, it is considered there will potential 'negative', 'slight' and 'short-term' impact in the WFD status of the Ennell Lake. There is no perceived impact on any further downstream waterbodies.

The mitigation measures are outlined above, including the SUDS in accordance with the GDSDS and construction mitigation measures, will prevent any impact on the receiving groundwater and surface water environment. 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 2012 (SI No 327 of 2012), and the European Communities Environmental Objectives (Groundwater) Regulations, 2010 (S.I. No. 9 of 2010), as amended 2012 (SI 149 of 2012) and 2016 (S.I. No. 366 of 2016).

Thus, the Proposed Development will not cause a deterioration in the status of water bodies hydraulically connected with the Proposed Development, taking account of design avoidance and mitigation measures that will be implemented. Hydrocarbon interceptors on site will lead to a positive impact on water quality to downstream receptors including the Brosna River. Therefore, the impacts of the Proposed Development on the WFD will be 'neutral', 'imperceptible' and 'permanent'.

6.11 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.

The predicted impacts of the construction phase and operational phase of the Proposed Development are described in Table 6.10 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 hydrology and hydrogeology anticipated regarding this Proposed Development.

Table 6.10 Residual Impacts

Activity	Attribute	Predicted Impact	Quality	Significant	Duration	Type	Mitigation	Residual Impact
Construction Phase								
Construction of Proposed Development	Hydrological Flow Regime	During construction, the recharge potential will increase temporarily in localised areas of the site.	Neutral	Imperceptible	Temporary	Direct	None required. The exposure of the underlying aquifer will be temporary, and that the extent of any impact will be localised to immediate area of excavation. This will be reduced over the course of the construction of the Proposed Development with an overall increase in impermeable areas and reduced infiltration potential.	Imperceptible
Accidental Release of Deleterious Materials (e.g., Fuels or Other Hazardous Materials Being Used Onsite) and cementitious materials	Groundwater and Surface Water Quality / WFD status	Potential for uncontrolled release of deleterious materials to the underlying groundwater and surface water environment with potential impact on the receiving water quality / WFD Status of the land drains to the north of the site, Brosna River, Ennell Lake and the Inny and Clara GWBs.	Negative	Moderate to Significant	Long term	Direct/ Worst Case	The storage of fuels and other hazardous materials, refuelling and lubrication of plant during the Construction Phase will only be carried out in accordance with the requirements and procedures outlined in the CEMP. The cementitious materials will avoid contamination through the use of appropriate design and methods implemented by the appointed Contractor and in accordance with the CEMP and relevant industry standards.	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significant	Duration	Type	Mitigation	Residual Impact
Release of Suspended Solids / Sediments During Groundworks	Water quality	There is a risk of contamination entrained in surface water run-off entering the land drains to the north of the site, discharging to the Brosna River, and tracking downstream.	Negative	Slight	Short term	Direct	Appropriate measures outlined in the CEMP including silt fences and buffer zones to be used to prevent fugitive runoff.	Imperceptible
Discharge of Water to Sewer, Water courses or Ground	Water Quality	Where localised water must be pumped from excavations (i.e., following heavy rainfall), water will be discharged following appropriate treatment (e.g., settlement or hydrocarbon interceptor) to sewer, watercourses or groundwater.	Neutral	Imperceptible	Temporary	Direct	There will be no unauthorised discharge of water (groundwater / surface water runoff) to sewer, watercourses or groundwater during the construction phase of the Proposed Development. All water will be discharged in accordance with the necessary discharge licences issued by UE or WCC.	Imperceptible
Operational Phase								
Proposed Development	Hydrological Flow Regime	The Proposed Development will convert a percentage of the surface to impermeable surfaces due to the construction of buildings, roads and other infrastructure.	Neutral	Imperceptible	Temporary	Direct	Infiltration tests carried out across the site indicate 'low' infiltration potential. The proposed SuDS measures adopted across the site will allow discharge of surface water run-off from the site to ground. Thus, the overall change in recharge to the underlying aquifer will be negligible.	Imperceptible

Activity	Attribute	Predicted Impact	Quality	Significant	Duration	Type	Mitigation	Residual Impact
Surface Water Drainage & Management of SuDS	Water Quality	In the worst-case scenario of accidental spillage from a car engine and failure of SuDs there is a potential risk to water quality in the receiving environment.	Negative	Moderate	Medium-Term	Direct/ Worst Case	Surface water drainage at the Proposed Development has been designed in accordance with SuDS and therefore it is anticipated that there will be an overall positive impact on water quality of groundwater and surface water.	Imperceptible
Proposed Development Drainage	Flood risk and surface water flow regime	The FRA concludes the Proposed Development i appropriately located I Flood Zone C and the Proposed Development will not result in displacement of any potential flood waters, will not obstruct important flow paths and will not adversely impact on the hydrological regime of the area or increase flood risk elsewhere	Neutral	Imperceptible	Long Term	Direct	None Required. Ongoing maintenance of the SUDS and drainage network will be undertaken.	Imperceptible
Surface Water / Foul Drainage	Water Quality	The Proposed Development will not result in any impact on the receiving water quality.	Neutral	Imperceptible	Long Term	Direct (also cumulative)	None required.	Imperceptible
Surface Water / Foul Drainage	WFD Status	There is no identified risk to the WFD status for the Operational Phase.	Neutral	Imperceptible	Long Term	Direct	None required.	Imperceptible.

6.12 Risk of Major Accidents or Disasters

There is no identified risk of flooding at the site.

The site is not located within an area associated with karst geology and therefore risk associated with karst features.

6.13 Significant Interactions

6.13.1 Population and Human Health

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

No public health issues associated with the water (hydrology and hydrogeology) conditions at the site have been identified for the construction phase or operational phase of the Proposed Development.

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

6.13.2 Biodiversity

An assessment of the potential impacts of the Proposed Development on the biodiversity of the subject site, with emphasis on habitats, flora and fauna which may be impacted as is included in Chapter 14 of this EIAR such as potential pollution of waterbodies impacting on flora and fauna in the absence of mitigation measures.

Chapter 14 addresses impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.

6.13.3 Land, Soils and Geology

An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment during the construction phase and operational of the Proposed Development is set out in Chapter 5. In the absence of avoidance and mitigation measures, there is a potential for sediments from excavated soils entering the drainage network and tracking downstream during the construction phase.

6.13.4 Material Assets- Site Services

An assessment of the potential impact on the Proposed Development on the material assets including built services and infrastructure has been set out in Chapter X of this EIAR.

During the Construction Phase of the Proposed Development discharge of water will be accordance with necessary licensing and consent of Westmeath County Council.

During the Operational Phase of the Proposed Development, any discharge to the public foul sewer and water supply will be under consent from UE.

6.14 References & Sources

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Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 7

Air Quality

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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7 Air Quality

7.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on air quality associated with the proposed development at Rathgowan, Mullingar, Co. Westmeath.

It should be read in conjunction with Chapter 12 'Material Assets: Traffic and Transport'.

7.2 Expertise & Qualifications

This chapter was completed by Aisling Cashell, an Environmental Consultant in the air quality section of AWN Consulting Ltd. She holds a BA and an MAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. She is a member of Engineers Ireland. She specialises in the area of air quality, climate and sustainability.

7.3 Proposed Development

The proposed development at Rathgowan, Mullingar, Co. Westmeath. The proposed development will consist of a mix of residential units, landscaping and amenity areas and all associated infrastructure works. A full description of the development can be found in Chapter 2 'Site Location and Project Description'.

The proposed development comprises Phase 1 and Phase 2 of a wider masterplan development; Phase 1 and Phase 2 are located to the east of the R394 with Phase 3 located to the west of the R394. A planning application for Phase 3 was submitted to Westmeath County Council previously. The data pertaining to the Phase 3 application has been reviewed as part of the current assessment and used to inform the cumulative impact assessment.

7.3.1 Aspects Relevant to this Assessment

During the construction phase construction dust emission have the potential to impact air quality. Dust emissions will primarily occur as a result of site preparation works, earthworks and the movement of trucks on site and exiting the site. There is also the potential for engine emissions from site vehicles and machinery to impact air quality. Construction phase impacts will be short-term in duration.

Engine emissions from vehicles accessing the site have the potential to impact air quality during the operational phase of the development through the release of NO_2, PM_{10} and $PM_{2.5}$. Operational phase impacts will be long-term in duration.

7.4 Methodology

7.4.1 Relevant Legislation & Guidance

The principal guidance and best practice documents used to inform the assessment of potential impacts on Air Quality is summarised below.

- 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);
- Advice Note on Preparing Environmental Impact Statements – Draft (EPA, 2015);
- Guidance on the Assessment of Dust from Demolition and Construction Version 1.1 (Institute of Air Quality Management (IAQM), 2014);
- TII Guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a) and TII Road Emissions Model (REM) online calculator tool (TII, 2022b).

7.4.1.1 Ambient Air Quality Standards

In order to reduce the risk to health from poor air quality, National and European statutory bodies, the Department of the Environment, Heritage and Local Government in Ireland and the European Parliament and Council of the European Union, have set limit values in ambient air for a range of air pollutants. These limit values or "Air Quality Standards" are health or environmental-based levels for which additional factors may be considered. For example, natural background levels, environmental conditions and socio-economic factors may all play a part in the limit value which is set.

Air quality significance criteria are assessed based on compliance with the appropriate standards or limit values. The applicable standards in Ireland include the Air Quality Standards Regulations 2022, which incorporate European Commission Directive 2008/50/EC, which has set limit values for numerous pollutants with the limit values for NO_2, PM_{10}, and $PM_{2.5}$ being relevant to this assessment. Council Directive 2008/50/EC combines the previous Air Quality Framework Directive (96/62/EC) and its subsequent daughter directives (including 1999/30/EC and 2000/69/EC) and includes ambient limit values relating to $PM_{2.5}$. The applicable limit values for NO_2, PM_{10}, and $PM_{2.5}$ are set out in Table 7.1.

Table 7.1 Ambient Air Quality Standards & TA Luft

Pollutant	RegulationNote1	Limit Type	Value
Dust Deposition	TA Luft (German VDI 2002)	Annual average limit for nuisance dust	350 mg/m²/day
Nitrogen Dioxide	2008/50/EC	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m³
		Annual limit for protection of human health	40 µg/m³
Particulate Matter (as PM_{10})	2008/50/EC	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m³ PM_{10}
		Annual limit for protection of human health	40 µg/m³ PM_{10}
Particulate Matter (as $PM_{2.5}$)	2008/50/EC	Annual limit for protection of human health	25 µg/m³ $PM_{2.5}$

Note 1 EU 2008/50/EC – Clean Air For Europe (CAFÉ) Directive replaces the previous Air Framework Directive (1996/30/EC) and daughter directives 1999/30/EC and 2000/69/EC

In April 2023, the Government of Ireland published the Clean Air Strategy for Ireland (Government of Ireland 2023), which provides a high-level strategic policy framework needed to reduce air pollution. The strategy commits Ireland to achieving the 2021 WHO Air Quality Guidelines Interim Target 3 (IT3) by 2026, the IT4 targets by 2030 and the final targets by 2040 (shown in Table 7.2). The strategy notes that a significant number of EPA monitoring stations observed air pollution levels in 2021 above the WHO targets; 80% of these stations would fail to meet the final $PM_{2.5}$ target of 5 µg/m³. The strategy also acknowledges that "*meeting the WHO targets will be challenging and will require legislative and societal change, especially with regard to both $PM_{2.5}$ and NO_2*". Ireland will revise its air quality legislation in line with the proposed EU revisions to the CAFE Directive, which will set interim 2030 air quality standards and align the EU more closely with the WHO targets.

Table 7.2 WHO Air Quality Guidelines

Pollutant	Regulation	Limit Type	IT3 (2026)	IT4 (2030)	Final Target (2040)
NO_2	WHO Air Quality Guidelines	24-hour limit for protection of human health	50µg/m³ NO_2	50µg/m³ NO_2	25µg/m³ NO_2
		Annual limit for protection of human health	30µg/ m³ NO_2	20µg/ m³ NO_2	10µg/m³ NO_2
PM (as PM_{10})		24-hour limit for protection of human health	75µg/ m³ PM_{10}	50µg/m³ PM_{10}	45µg/m³ PM_{10}
		Annual limit for protection of human health	30µg/ m³ PM_{10}	20µg/ m³ PM_{10}	15µg/m³ PM_{10}
PM (as $PM_{2.5}$)		24-hour limit for protection of human health	37.5µg/m³ $PM_{2.5}$	25µg/m³ $PM_{2.5}$	15µg/m³ $PM_{2.5}$
		Annual limit for protection of human health	15µg/m³ $PM_{2.5}$	10µg/m³ $PM_{2.5}$	5µg/m³ $PM_{2.5}$

7.4.1.2 Dust Deposition Guidelines

The concern from a health perspective is focused on particles of dust, which are less than 10 microns, and the EU ambient air quality standards outlined in Section 7.4.1.1 have set ambient air quality limit values for PM_{10} and $PM_{2.5}$.

With regard to larger dust particles that can give rise to nuisance dust, there are no statutory guidelines regarding the maximum dust deposition levels that may be generated during the construction phase of a development in Ireland.

However, guidelines for dust deposition, the German TA-Luft standard for dust deposition (non-hazardous dust) (German VDI, 2002) sets a maximum permissible emission level for dust deposition of 350 mg/m^2/day averaged over a one-year period at any receptors outside the site boundary. The TA-Luft standard has been applied for the purpose of this assessment based on recommendations from the EPA in Ireland in the document titled 'Environmental Management Guidelines - Environmental Management in the Extractive Industry (Non-Scheduled Minerals) (EPA, 2006). The document recommends that the TA-Luft limit of 350 mg/m^2/day be applied to the site boundary of quarries. This limit value can be implemented with regard to dust impacts from construction of the Proposed Development.

7.4.2 Site Surveys/Investigation

No on-site surveys were required for the air quality assessment. The baseline air quality environment was established using available long-term EPA monitoring data for representative locations (see Section 7.5.2)

7.4.3 Consultation

A Section 247 and a Section 32B meetings were held with the Council. Additional consultation with specific relevant bodies was not required as part of the air quality assessment.

7.4.4 Construction Phase Methodology

The Institute of Air Quality Management in the UK (IAQM) guidance document 'Guidance on the Assessment of Dust from Demolition and Construction' (2014) outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. The IAQM methodology has been applied to the construction phase of this development in order to predict the likely risk of dust impacts in the absence of mitigation measures and to determine the level of site-specific mitigation required. The use of UK guidance is recommended by Transport Infrastructure Ireland in their guidance document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a).

The major dust generating activities are divided into four types within the IAQM guidance (2014) to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

The magnitude of each of the four categories is divided into Large, Medium or Small scale depending on the nature of the activities involved. The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities. This allows the level of site-specific mitigation to be determined.

Construction phase traffic also has the potential to impact air quality. The TII guidance *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a), states that road links meeting one or more of the following criteria can be defined as being 'affected' by a proposed development and should be included in the local air quality assessment. While the guidance is specific to infrastructure projects the approach can be applied to any development that causes a change in traffic.

- Annual average daily traffic (AADT) changes by 1,000 or more;
- Heavy duty vehicle (HDV) AADT changes by 200 or more;
- Daily average speed change by 10 kph or more;
- Peak hour speed change by 20 kph or more;
- A change in road alignment by 5m or greater.

The construction stage traffic will not increase by 1,000 AADT or 200 HDV AADT and therefore does not meet the above scoping criteria. In addition, there are no proposed changes to the traffic speeds or road alignment. As a result a detailed air assessment of construction stage traffic emissions has been scoped out from any further assessment as there is no potential for significant impacts to air quality.

7.4.5 Operational Phase Methodology

Operational phase traffic has the potential to impact local air quality as a result of increased vehicle movements associated with the proposed development. The TII scoping criteria detailed in Section7.4.4 were used to determine if any road links are affected by the proposed development and

require inclusion in a detailed air dispersion modelling assessment. The proposed development will result in the operational phase traffic increasing by more than 1,000 AADT on a number of road links. Therefore, a detailed air dispersion modelling assessment of operational phase traffic emissions was conducted.

The impact to air quality as a result of changes in traffic is assessed at sensitive receptors in the vicinity of affected roads. The TII guidance (2022a) states a proportionate number of representative receptors which are located in areas which will experience the highest concentrations or greatest improvements as a result of the proposed development are to be included in the modelling. The TII criteria state that receptors within 200m of impacted road links should be assessed; roads which are greater than 200m from receptors will not impact pollutant concentrations at that receptor. The TII guidance (2022a) defines 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. A total of 3 no. high sensitivity residential receptors (R1 – R3) were included in the modelling assessment (see Figure 7.1).

The TII guidance (2022a) states that modelling should be conducted for NO_2, PM_{10} and $PM_{2.5}$ for the base, opening and design years for both the Do Minimum (Do Nothing) and Do Something scenarios. Modelling of operational NO_2, PM_{10} and $PM_{2.5}$ concentrations has been conducted for the Do Nothing and Do Something scenarios using the TII Road Emissions Model (REM) online calculator tool (TII, 2022b).

The following inputs are required for the REM tool: receptor locations, light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type, project county location and pollutant background concentrations. The *Default* fleet mix option was selected along with the *Intermediate Case* fleet data base selection, as per TII Guidance (TII, 2022b). The *Intermediate Case* assumes a linear interpolation between the *Business as Usual* case – where current trends in vehicle ownership continue and the *Climate Action Plan (CAP)* case – where adoption of low emission light duty vehicles occurs.

Using this input data the model predicts the road traffic contribution to ambient ground level concentrations at the identified sensitive receptors using generic meteorological data. The TII REM uses county-based Irish fleet composition for different road types, for different European emission standards from pre-Euro to Euro 6/VI with scaling factors to reflect improvements in fuel quality, retrofitting, and technology conversions. The TII REM also includes emission factors for PM_{10} emissions associated with brake and tyre wear (TII, 2022b). The predicted road contributions are then added to the existing background concentrations to give the predicted ambient concentrations. The ambient concentrations are then compared with the relevant ambient air quality standards to assess the compliance of the proposed development with these ambient air quality standards.

The TII document *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a) details a methodology for determining air quality impact significance criteria for road schemes which can be applied to any project that causes a change in traffic. The degree of impact is determined based on the percentage change in pollutant concentrations relative to the Do Nothing scenario. The TII significance criteria are outlined in Table 4.9 of *Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106* (TII, 2022a) and reproduced in Table 7.3 below. These criteria have been

adopted for the proposed development to predict the impact of NO_2 and PM_{10} emissions as a result of the proposed development.

Table 7.3 Air Quality Significance Criteria

Long Term Average Concentration at Receptor in Assessment Year	% Change in Concentration Relative to Air Quality Standard Value (AQLV)			
	1%	2-5%	6-10%	>10%
75% or less of AQLV	Neutral	Neutral	Slight	Moderate
76 – 94% of AQLV	Neutral	Slight	Moderate	Moderate
95 – 102% of AQLV	Slight	Moderate	Moderate	Substantial
103 – 109% of AQLV	Moderate	Moderate	Substantial	Substantial
110% or more of AQLV	Moderate	Substantial	Substantial	Substantial

Source: TII (2022a) Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106

7.4.5.1 Traffic Data Used in Modelling Assessment

Traffic flow information was obtained from TOBIN Consulting Engineers for the purposes of this assessment. Data for the Base Year 2025 and the Do Nothing and Do Something scenarios for the Opening Year 2025 and Design Year 2040 were provided. Specific cumulative developments have also been included in the traffic data for the assessment. These developments include committed developments Rathgowan Phase 3 (Planning Ref. 22/515). Traffic associated with a number of schools in the area that are not currently at full capacity was also included. Further details of the committed developments can be found in the Traffic and Transport Assessment prepared by TOBIN Consulting Engineers and submitted with this planning application.

The traffic data is detailed in Table 7.4. Only road links that met the TII scoping criteria and that were within 200m of receptors were included in the modelling assessment. Background concentrations have been included as per Section 7.5.2 of this chapter based on available EPA background monitoring data (EPA, 2022).

Table 7.4 Traffic Data used in Operational Phase Air Modelling Assessment

Road Name	Speed (kph)	Base Year	Opening Year		Design Year	
			Do Nothing	Do Something	Do Nothing	Do Something
		LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)	LDV AADT (HDV AADT)
Junction 1 C - R394 (South)	50	11976 (529)	13437 (652)	14819 (652)	16359 (930)	17740 (930)
Junction 2 A - R394 (North)	50	11988 (529)	13450 (652)	14655 (652)	16374 (930)	17579 (930)
Junction 2 C - R394 (South)	50	11988 (529)	13450 (652)	14656 (652)	16374 (930)	17580 (930)

Figure 7.1 Location of Sensitive Receptors used in Operational Phase Air Quality Assessment

7.4.6 Difficulties Encountered

There were no difficulties encountered in compiling this assessment.

7.5 Baseline Environment

7.5.1 Meteorological Data

A key factor in assessing temporal and spatial variations in air quality is the prevailing meteorological conditions. Depending on wind speed and direction, individual receptors may experience very significant variations in pollutant levels under the same source strength (i.e. traffic levels) (WHO, 2006). Wind is of key importance in dispersing air pollutants and for ground level sources, such as traffic emissions, pollutant concentrations are generally inversely related to wind speed. Thus, concentrations of pollutants derived from traffic sources will generally be greatest under very calm conditions and low wind speeds when the movement of air is restricted. In relation to PM_{10}, the situation is more complex due to the range of sources of this pollutant. Smaller particles (less than $PM_{2.5}$) from traffic sources will be dispersed more rapidly at higher wind speeds. However, fugitive emissions of coarse particles ($PM_{2.5}$ - PM_{10}) will actually increase at higher wind speeds. Thus, measured levels of PM_{10} will be a non-linear function of wind speed.

The nearest representative weather station collating detailed weather records is Mullingar meteorological station, which is located less than 1 km north of the proposed development. Mullingar met data has been examined to identify the prevailing wind direction and average wind speeds over a five-year period (see Figure 7.2). For data collated during five representative years (2017 – 2021), the predominant wind direction is southerly to south-westerly with a mean wind speed of 3.9 m/s over the 30-year period 1979 – 2008 (more recent 30-year averages are not available) (Met Eireann, 2023).

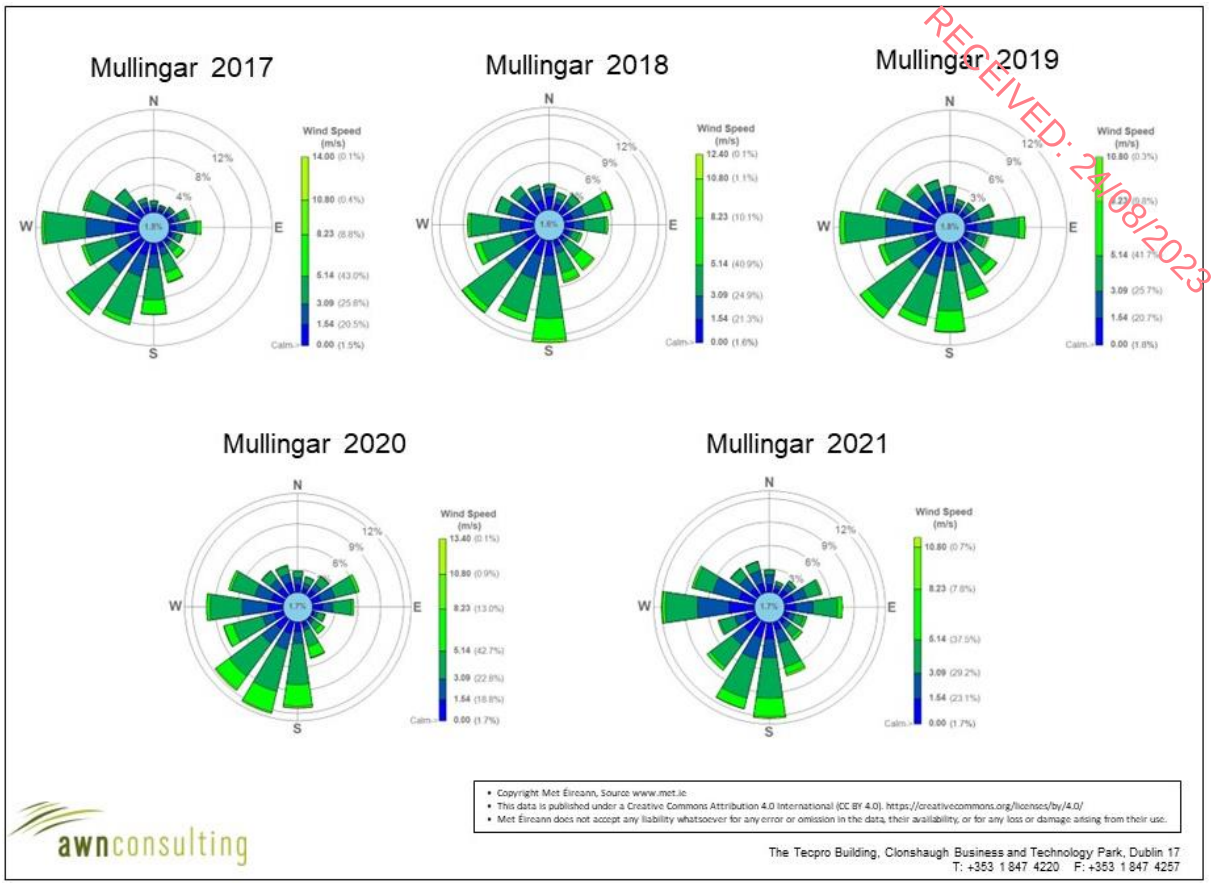

Figure 7.2 Windrose 2017-2021 (Source: Met Eireann, 2023)

7.5.2 Baseline Air Quality

Air quality monitoring programs have been undertaken in recent years by the EPA. The most recent annual report on air quality in Ireland is "Air Quality In Ireland 2021" (EPA, 2022a). The EPA website details the range and scope of monitoring undertaken throughout Ireland and provides both monitoring data and the results of previous air quality assessments (EPA, 2022b).

As part of the implementation of the Framework Directive on Air Quality (1996/62/EC, four air quality zones have been defined in Ireland for air quality management and assessment purposes (EPA, 2022b). Dublin is defined as Zone A and Cork as Zone B. Zone C is composed of 23 towns with a population of greater than 15,000. The remainder of the country, which represents rural Ireland but also includes all towns with a population of less than 15,000, is defined as Zone D.

In terms of air monitoring and assessment, the proposed development site is within Zone C (EPA, 2022b). The long-term monitoring data has been used to determine background concentrations for the key pollutants in the region of the proposed development. The background concentration accounts for all non-traffic derived emissions (e.g. natural sources, industry, home heating etc.).

In 2020 the EPA reported (EPA, 2022a) that Ireland was compliant with EU legal air quality limits at all locations, however this was largely due to the reduction in traffic due to Covid-19 restrictions. The EPA Air Quality in Ireland 2020 report details the effect that the Covid-19 restrictions had on air monitoring stations, which included reductions of up to 50% at some monitoring stations which have

traffic as a dominant source. The report also notes that CSO figures show that while traffic volumes are still slightly below 2019 levels, they have significantly increased since 2020 levels. 2020 concentrations are therefore predicted to be an exceptional year and not consistent with long-term trends. For this reason, they have not been included in the baseline section and previous long-term data has been used to determine baseline levels of pollutants in the vicinity of the proposed development.

7.5.2.1 NO_2

Long-term NO_2 monitoring was carried out at three Zone C locations for the period 2017 – 2021, Kilkenny, Portlaoise and Dundalk (EPA, 2022a). Annual mean concentrations of NO_2 range from 4 – 14 µg/m^3 over the 2017 – 2021 period (Table 7.5). Long term average concentrations are significantly below the annual average limit of 40 µg/m^3. Based on the above information, a conservative estimate of the current background NO_2 concentration in the region of the proposed development is 15 µg/m^3.

Table 7.5 Trends in Zone C Air Quality – Nitrogen Dioxide (NO_2)

Station	Averaging Period Note 1	Year				
		2017	2018	2019	2020	2021
Kilkenny	Annual Mean NO_2 (µg/m^3)	5	6	5	4	4
	99.8 1-hr NO_2 (µg/m^3)	41	45	42	40	35
Portlaoise	Annual Mean NO_2 (µg/m^3)	11	11	11	8	8
	99.8 1-hr NO_2 (µg/m^3)	60	68	60	52	49
Dundalk	Annual Mean NO_2 (µg/m^3)	-	-	12	10	11
	99.8 1-hr NO_2 (µg/m^3)	-	-	69	73	67

Note 1 Annual average limit value - 40 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022). 1-hour limit value - 200 µg/m^3 (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

7.5.2.2 PM_{10}

Continuous PM_{10} monitoring was carried out at four Zone C locations from 2017 – 2021, Galway, Ennis, Portlaoise and Dundalk. Concentrations range from 12 – 120 µg/m^3 over the period (Table 7.6). Average concentrations across the five years (2017 to 2021) was 11.8 µg/m^3 for Portlaoise, 13.4 µg/m^3 for Dundalk and higher at 17.8 µg/m^3 for Ennis. Hence, long term concentrations are significantly below the annual limit value of 40 µg/m^3. In addition, there were at most 19 exceedances (in Ennis) of the 24-hour limit value of 50 µg/m^3 in 2021, albeit 35 exceedances are permitted per year (EPA, 2022a). Based on the EPA data, an estimate of the current background PM_{10} concentration in the region of the development is 14 µg/m^3.

Table 7.6 Trends in Zone C Air Quality – PM_{10}

Station	Averaging Period Note 1	Year				
		2017	2018	2019	2020	2021
Athlone	Annual Mean PM_{10} (µg/m³)	-	-	17	16	12
	24-hr Mean > 50 µg/m³ (days)	-	-	0	3	2
Ennis	Annual Mean PM_{10} (µg/m³)	16	16	18	20	19
	24-hr Mean > 50 µg/m³ (days)	9	4	12	19	17
Portlaoise	Annual Mean PM_{10} (µg/m³)	10	11	15	12	11
	24-hr Mean > 50 µg/m³ (days)	0	1	0	0	1
Dundalk	Annual Mean PM_{10} (µg/m³)	-	15	14	13	12
	24-hr Mean > 50 µg/m³ (days)	-	0	2	2	0

Note1 Annual average limit value - 40 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022). Daily limit value - 50 µg/m³ (EU Council Directive 2008/50/EC & S.I. No. 739 of 2022).

7.5.2.3 $PM_{2.5}$

Average $PM_{2.5}$ levels in Ennis over the period 2017 – 2021 ranged from 10 – 15 µg/m³, with a $PM_{2.5}/PM_{10}$ ratio ranging from 0.63 – 0.8 (EPA, 2022a). Based on this information, a ratio of 0.7 was used to generate an existing $PM_{2.5}$ concentration in the region of the proposed development of 9.3 µg/m³.

The current background concentrations have been used in the operational phase air quality assessment for both the Opening Year and Design Year as a conservative approach in order to predict pollutant concentrations in future years. This is in line with the TII methodology (TII, 2022a).

Based on the above information the air quality in Zone C locations, such as the Mullingar area is generally good, with concentrations of the key pollutants generally well below the relevant limit values. However, the EPA have indicated that road transport emissions are contributing to increased levels of NO_2 with the potential for breaches in the annual NO_2 limit value in future years at locations within urban centres and roadside locations. In addition, burning of solid fuels for home heating is contributing to increased levels of particulate matter (PM_{10} and $PM_{2.5}$). The EPA predict that exceedances in the particulate matter limit values are likely in future years if burning of solid fuels for residential heating continues (EPA, 2022a).

7.5.3 Sensitivity of the Receiving Environment

In line with the UK Institute of Air Quality Management (IAQM) guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*' (2014) prior to assessing the impact of dust from a Proposed Development the sensitivity of the area must first be assessed as outlined below. Both receptor sensitivity and proximity to proposed works areas are taken into consideration. For the purposes of this assessment, high sensitivity receptors are regarded as residential properties where people are likely to spend the majority of their time, schools and hospitals.

In terms of receptor sensitivity to dust soiling, there are a small number of high sensitivity residential properties within 100m of the site boundary (see Figure 7.3). There are 39 properties within 100m, 17

within 50m and 14 within 20m of the site boundary. Therefore, the overall sensitivity of the area to dust soiling impacts is considered high based on the IAQM criteria outlined in Table 7.7.

Table 7.7 Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	**High**	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Source (IAQM, 2014) Guidance on the Assessment of Dust from Demolition and Construction

In addition to sensitivity to dust soiling, the IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to human health impacts. The criteria take into consideration the current annual mean PM_{10} concentration, receptor sensitivity based on type (residential receptors are classified as high sensitivity) and the number of receptors affected within various distance bands from the construction works. A conservative estimate of the current annual mean PM_{10} concentration in the vicinity of the Proposed Development is 11 µg/m^3 and there is 1 no. high sensitivity receptor within 20m of the Proposed Development boundary (see Figure 7.3). Based on the IAQM criteria outlined in Table 7.8, the worst-case sensitivity of the area to human health is considered low.

Table 7.8 Sensitivity of the Area to Dust Related Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number of Receptors	Distance from Source (m)				
			<20	<50	<100	<200	<350
High	< 24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	**Low**	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	< 24 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	< 24 µg/m^3	>1	Low	Low	Low	Low	Low

Source (IAQM, 2014) Guidance on the Assessment of Dust from Demolition and Construction

The IAQM guidelines also outline the assessment criteria for determining the sensitivity of the area to dust-related ecological impacts. Dust emissions can coat vegetation leading to a reduction in the photosynthesising ability of the plant as well as other effects. The guidance states that dust impacts to vegetation can occur up to 50m from the site and 50m from site access roads, up to 500m for the site entrance. The sensitivity of the area is determined based on the distance to the source, the designation of the site, (European, National or local designation) and the potential dust sensitivity of the ecologically important species present.

The closest designated sites are Lough Owel SPA/Lough Owel SAC are 4km to the northwest of the site and Lough Ennell SAC is located 4km to the south of the site. Lough Sheever Fen/Slevin's Lough Complex (pNHA) are 4km to the northeast of the site. The Royal Canal (pNHA) runs easterly from the north to the south of the site. Walshestown Fen (pNHA) is located 4km to the west of the site. High sensitivity ecological receptors are sites with European or National designation with particularly dust sensitive species present. These designated areas will be unaffected by dust emissions due to the distance from the works. The designated sites are all more than 50m away from the proposed development which is the area of potential impact as per IAQM guidelines (IAQm 2014).

Figure 7.3 Sensitive Receptors within 20m, 50m and 100m of Site Boundary

7.6 The 'Do Nothing' Scenario

Under the Do Nothing Scenario no construction works associated with the Phase 1 and Phase 2 development will take place and the previously identified impacts of fugitive dust and particulate matter emissions and emissions from equipment and machinery will not occur. Impacts from increased traffic volumes and associated air emissions from the proposed Phase 1 and Phase 2 development will also not occur. However, the proposed development is part of a wider masterplan site and a planning application for the Phase 3 development has been submitted to Westmeath County Council and granted and therefore development on the site in the absence of Phase 1 and Phase 2 will likely occur.

It is proposed to develop the entire masterplan site on a phased basis, and therefore impacts as a result of construction works and increased traffic will still occur albeit to a lesser extent due to the smaller scale of development. Further details of the construction phasing strategy can be found in Chapter 2 and the CEMP. This scenario is considered neutral in terms of air quality.

7.7 Potential Significant Effects

7.7.1 Construction Phase

7.7.1.1 Air Quality

The greatest potential impact on air quality during the construction phase of the Proposed Development is from construction dust emissions and the potential for nuisance dust. While construction dust tends to be deposited within 350m of a construction site, the majority of the deposition occurs within the first 50 m. The extent of any dust generation depends on the nature of the dust (soils, peat, sands, gravels, silts etc.) and the nature of the construction activity. In addition, the potential for dust dispersion and deposition depends on local meteorological factors such as rainfall, wind speed and wind direction. A review of Mullingar meteorological data indicates that the prevailing wind direction is south-westerly to southerly and wind speeds are generally moderate in nature (see Section 7.5.1). In addition, dust generation is considered negligible on days where rainfall is greater than 0.2 mm. A review of historical 30 year average data for Mullingar meteorological station indicates that on average 209 days per year have rainfall over 0.2 mm (Met Eireann, 2022) and therefore it can be determined that 57% of the time dust generation will be reduced.

In order to determine the level of dust mitigation required during the proposed works, the potential dust emission magnitude for each dust generating activity needs to be taken into account, in conjunction with the previously established sensitivity of the area (see Section 7.5.3). As per Section 7.4.4, the major dust generating activities are divided into four types within the IAQM guidance to reflect their different potential impacts. These are:

- Demolition;
- Earthworks;
- Construction; and
- Trackout (transport of dust and dirt from the construction site onto the public road network).

7.7.1.1.1 Demolition

There are no demolition activities associated with the Proposed Development. Therefore, there is no demolition impact predicted as a result of the works.

7.7.1.1.2 Earthworks

Earthworks primarily involve excavating material, loading and unloading of materials, tipping and stockpiling activities. Activities such as levelling the site and landscaping works are also considered under this category. The dust emission magnitude from earthworks can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: Total site area > 10,000m^2, potentially dusty soil type (e.g. clay which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds > 8m in height, total material moved >100,000 tonnes;

Medium: Total site area 2,500m^2 – 10,000m^2, moderately dusty soil type (e.g. silt), 5 - 10 heavy earth moving vehicles active at any one time, formation of bunds 4m – 8m in height, total material moved 20,000 – 100,000 tonnes;

Small: Total site area < 2,500m^2, soil type with large grain size (e.g. sand), < 5 heavy earth moving vehicles active at any one time, formation of bunds < 4m in height, total material moved < 20,000 tonnes, earthworks during wetter months.

The dust emission magnitude for the proposed earthwork activities can be classified as **large** as the total material moved (both excavations and infilling works) will be more than 100,000 tonnes.

The sensitivity of the area, as determined in Section 7.5.3, is combined with the dust emission magnitude for each dust generating activity to define the risk of dust impacts in the absence of mitigation. As outlined in Table 7.9, this results in an overall high risk of dust soiling impacts and, as outlined in Table 7.8, a low sensitivity of dust related human health impacts as a result of the proposed earthworks activities.

Table 7.9 Risk of Dust Impacts – Earthworks

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	**High Risk**	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

7.7.1.1.3 Construction

Dust emission magnitude from construction can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: Total building volume > 100,000 m^3, on-site concrete batching, sandblasting;

Medium: Total building volume 25,000m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on-site concrete batching;

Small: Total building volume < 25,000m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

The dust emission magnitude for the proposed construction activities can be classified as **medium** as the total building volume is likely between 25,000m^3 and 100,000 m^3. As outlined in Table 7.10, this results in an overall medium risk of dust soiling impacts and a low sensitivity of human health impacts as a result of the proposed construction activities.

Table 7.10 Risk of Dust Impacts – Construction

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	**Medium Risk**	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

7.7.1.1.4 Trackout

Factors which determine the dust emission magnitude are vehicle size, vehicle speed, number of vehicles, road surface material and duration of movement. Dust emission magnitude from trackout can be classified as small, medium or large based on the definitions from the IAQM guidance as transcribed below:

Large: > 50 HGV (> 3.5 t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length > 100 m;

Medium: 10 - 50 HGV (> 3.5 t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 - 100 m;

Small: < 10 HGV (> 3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length < 50 m.

The dust emission magnitude for the proposed trackout can be classified as medium, as at worst-case peak periods there will be between 10 and 50 outward HGV movements per day. As outlined in Table 7.11, this results in an overall medium risk of dust soiling impacts and a low sensitivity risk of human health impacts as a result of the proposed trackout activities.

Table 7.11 Risk of Dust Impacts – Trackout

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	**Medium Risk**	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

7.7.1.1.5 Summary of Dust Emission Risks

The risk of dust impacts as a result of the Proposed Development are summarised in Table 7.12 for each activity. The magnitude of risk determined is used to prescribe the level of site-specific mitigation required for each activity in order to prevent significant impacts occurring.

There is at most a high risk of dust soiling and human health impacts associated with the proposed works. Best practice dust mitigation measures will be implemented to ensure there are no significant impacts at nearby sensitive receptors. In the absence of mitigation, dust impacts are predicted to be temporary, negative and imperceptible.

Table 7.12 Summary of Dust Impact Risk used to Define Site-Specific Mitigation

Potential Impact	Dust Emission Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Emission Magnitude	-	Large	Medium	Medium
Dust Soiling Risk	-	High Risk	Medium Risk	Medium Risk
Human Health Risk	-	Low Risk	Low Risk	Low Risk
Ecological Risk	-	-	-	-

There is also the potential for traffic emissions to impact air quality in the short-term over the construction phase, particularly due to the increase in HGVs accessing the site. The construction stage traffic has been reviewed and a detailed air quality assessment has been scoped out as none of the road links impacted by the Proposed Development satisfy the TII scoping assessment criteria in Section 7.4.4. It can therefore be determined that the construction stage traffic will have an imperceptible, direct, neutral and temporary impact on air quality.

7.7.1.2 Human Health

Dust emissions from the construction phase of the proposed development have the potential to impact human health through the release of PM_{10} and $PM_{2.5}$ emissions. As per Table 7.12, the surrounding area is of low sensitivity to dust-related human health impacts. In addition, there is at most a low risk of dust-related human health impacts as a result of the proposed construction works. In the absence of mitigation there is the potential for short-term, negative and imperceptible impacts to human health as a result of construction dust emissions.

7.7.2 Operational Phase

7.7.2.1 Air Quality

The potential impact of the proposed development has been assessed by modelling emissions from the traffic generated as a result of the development. The traffic data includes the Do Nothing and Do Something scenarios (see Section7.4.5). The impact of NO_2, PM_{10} and $PM_{2.5}$ emissions for the Opening and Design Years was predicted at the nearest sensitive receptors to the development. This assessment allows the significance of the development, with respect to both relative and absolute impacts, to be determined.

The TII guidance PE-ENV-01106 (TII, 2022a) details a methodology for determining air quality impact significance criteria for TII road schemes and infrastructure projects. However, this significance criteria can be applied to any development that causes a change in traffic. The degree of impact is determined based on both the absolute and relative impact of the proposed development. Results are compared against the 'Do-Nothing' scenario, which assumes that the proposed development is not in place in future years, in order to determine the degree of impact.

The results of the assessment of the impact of the proposed development on NO_2 in the Opening Year 2025 and Design Year 2040 are shown in Table 7.13. The annual average concentration is in

compliance with the limit value at the worst-case receptors in 2025 and 2040. Concentrations of NO_2 are at most 47% of the annual limit value in 2025 and 41% of the annual limit value in 2040. There are predicted to be some increases in traffic between the Opening and Design years. Therefore, any decrease in concentration is due to increased uptake in electric vehicles and lower vehicle exhaust emissions. In addition, the TII guidance (2022a) states that the hourly limit value for NO_2 of 200 µg/m^3 is unlikely to be exceeded at roadside locations unless the annual mean is above 60 µg/m^3. As predicted NO_2 concentrations are significantly below 60 µg/m^3 (Table 7.13) it can be concluded that the short-term NO_2 limit value will be complied with at all receptor locations.

The impact of the proposed development on annual mean NO_2 concentrations can be assessed relative to "Do Nothing (DN)" levels. NO_2 concentrations at the receptors assessed will increase as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.27 µg/m^3 at receptor R1, this is a 1.4% change from baseline conditions. Where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 7.1) and there is a less than 5% change in concentrations compared with the Do-Nothing scenario, then the impact is considered neutral as per the TII significance criteria (see Table 7.3). Therefore, the impact of the proposed development on NO_2 concentrations is neutral.

In relation to changes in PM_{10} concentrations due to the proposed development, the results of the assessment can be seen in Table 7.14 for the Opening Year 2025 and Design Year 2040. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2025 and 2040. Concentrations of PM_{10} are at most 42% of the annual limit value in 2025 and 2040. In addition, the proposed development will not result in any exceedances of the daily PM_{10} limit value of 50 µg/m^3. The impact of the proposed development on annual mean PM_{10} concentrations can be assessed relative to "Do Nothing (DN)" levels. PM_{10} concentrations at the receptors assessed will increase as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.12 µg/m^3 at receptor R1, this is a 0.8% change from baseline conditions. As with NO_2, where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 7.1) and there is a less than 5% change in concentrations compared with the Do-Nothing scenario then the impact is considered neutral as per the TII significance criteria (see Table 7.3). Therefore, the impact of the proposed development on PM_{10} concentrations is neutral.

The results of the assessment of changes in $PM_{2.5}$ concentrations due to the proposed development, can be seen in Table 7.15 for the Opening Year 2025 and Design Year 2040. The annual average concentration is in compliance with the limit value at the worst-case receptors in 2025 and 2040. Concentrations of $PM_{2.5}$ are at most 52% of the annual limit value in 2025 and 2040. The impact of the proposed development on annual mean $PM_{2.5}$ concentrations can be assessed relative to "Do Nothing (DN)" levels. $PM_{2.5}$ concentrations at the receptors assessed will increase as a result of the proposed development when compared with the Do-Nothing scenario. There will be at most an increase of 0.08 µg/m^3 at receptor R1, this is a 0.7% change from baseline conditions. As with NO_2 and PM_{10}, where the predicted annual mean concentrations are less than 75% of the air quality standard (see Table 7.1). There is a less than 5% change in concentrations compared with the Do-Nothing scenario then the impact is considered neutral as per the TII significance criteria (see Table 7.3). Therefore, the impact of the proposed development on $PM_{2.5}$ concentrations is neutral.

Overall, the impact of the proposed development on ambient air quality in the operational stage is considered long-term, localised, neutral, imperceptible and non-significant.

Table 7.13 Annual Mean NO_2 Concentrations (µg/m³)

Receptor	Impact Opening Year				
	DN	DS	DS-DN	% Change of AQAL	Description
R1	18.7	18.9	0.27	0.68%	Negligible
R2	18.1	18.3	0.21	0.53%	Negligible
R3	16.9	17.1	0.13	0.32%	Negligible
Receptor	**Impact Design Year**				
	DN	DS	DS-DN	% Change of AQAL	Description
R1	16.3	16.4	0.03	0.08%	Negligible
R2	16.1	16.2	0.03	0.08%	Negligible
R3	15.7	15.7	0.02	0.05%	Negligible

Table 7.14 Annual Mean PM_{10} Concentrations (µg/m³)

Receptor	Impact Design Year				
	DN	DS	DN	% Change of AQAL	DN
R1	15.8	15.9	0.12	0.30%	Negligible
R2	15.6	15.7	0.09	0.23%	Negligible
R3	15.0	15.0	0.06	0.15%	Negligible
Receptor	**Impact Design Year**				
	DN	DS	DN	% Change of AQAL	DN
R1	16.0	16.0	0.04	0.10%	Negligible
R2	15.7	15.7	0.03	0.08%	Negligible
R3	15.0	15.1	0.02	0.05%	Negligible

Table 7.15 Annual Mean $PM_{2.5}$ Concentrations (µg/m³)

Receptor	Impact Design Year				
	DN	DS	DN	% Change of AQAL	DN
R1	12.1	12.2	0.08	0.20%	Negligible
R2	11.9	12.0	0.05	0.13%	Negligible
R3	11.6	11.6	0.04	0.10%	Negligible
Receptor	**Impact Design Year**				
	DN	DS	**DN**	% Change of AQAL	**DN**
R1	12.1	12.2	0.03	0.07%	Negligible
R2	12.0	12.0	0.02	0.05%	Negligible
R3	11.6	11.6	0.01	0.02%	Negligible

7.7.2.2 Human Health

Traffic related air emissions have the potential to impact air quality which can affect human health. However, air dispersion modelling of traffic emissions has shown that levels of all pollutants are below the ambient air quality standards set for the protection of human health. It can be determined that the impact to human health during the operational stage is long-term, direct, neutral and imperceptible.

7.7.3 Cumulative Effects

7.7.3.1 Construction Phase

According to the IAQM guidance (2014) should the construction phase of the proposed development coincide with the construction phase of any other development within 350m then there is the potential for cumulative construction dust impacts. The construction of the proposed development has the potential to coincide with Phase 3 of the overall masterplan development for the area within the Applicant's ownership. When considering the construction of the masterplan site as a whole there is the potential for dust soiling impacts within 100m of site activities. There are a number of high sensitivity residential properties within 100m of the masterplan site boundary.

However, construction works will not be undertaken on the full site at any one time therefore, a smaller number of receptors will be impacted at any one time. Furthermore, a high level of dust control will be implemented across the site which will avoid significant dust emissions. Provided these mitigation measures are in place for the duration of the demolition and construction phase, cumulative dust related impacts to nearby sensitive receptors are not predicted to be significant. Cumulative impacts to air quality will be short-term, localised, negative and imperceptible.

There are no significant cumulative impacts to air quality predicted for the construction phase.

Chapter 7 'Air Quality' of the EIAR prepared for Phase 3 of the masterplan proposed a high level of dust mitigation to prevent significant impacts to nearby sensitive receptors. The measures proposed as part of Chapter 7 of the Phase 3 of the masterplan EIAR are incorporated in to the Construction Environmental Management Plan. The assessment concludes that once mitigation is in place impacts will be short-term, negative localised and imperceptible. In addition, best practice dust control measures will be implemented across the Phase 1 and Phase 2 sites which aligns with that proposed for the Phase 3 site. This will avoid significant dust emissions. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development are deemed short-term, negative, slight and not significant.

There are no significant cumulative impacts to air quality predicted for the construction phase.

7.7.3.2 Operational Phase

The traffic data reviewed for the operational stage impacts to air quality included the cumulative traffic associated with Phase 3 of the overall masterplan development. Any committed developments of significance require inclusion within the traffic assessment and therefore have been assessed as part of Section 7.7.2.1. Therefore, the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be long-term, direct, neutral and imperceptible with regards to air quality.

There are no significant cumulative impacts to air quality predicted for the operational phase.

7.8 Mitigation

7.8.1 Construction Phase Mitigation

The objective of dust control at the site is to ensure that no significant nuisance occurs at nearby sensitive receptors. In order to develop a workable and transparent dust control strategy, the following mitigation measures have been recommended by drawing on best practice guidance from Ireland, the UK (IAQM (2014), BRE (2003), The Scottish Office (1996), UK ODPM (2002)) and the USA (USEPA, 1997). These measures will be incorporated into the Construction Environmental Management Plan (CEMP) prepared for the site.

Site Management

The aim is to ensure good site management by preventing dust from becoming airborne at source. This will be done through good design and effective control strategies.

At the construction planning stage, the siting of activities and storage piles will take note of the location of sensitive receptors and prevailing wind directions in order to minimise the potential for significant dust nuisance (see Figure 7.2 for the windrose for Mullingar Meteorological Station). As the prevailing wind is predominantly westerly to south-westerly, locating construction compounds and storage piles downwind of sensitive receptors will minimise the potential for dust nuisance to occur at sensitive receptors.

Good site management will include the ability to respond to adverse weather conditions by either restricting operations on-site or quickly implementing effective control measures before the potential

for nuisance occurs. When rainfall is greater than 0.2mm/day, dust generation is generally suppressed (IAQM, 2014; UK ODPM, 2002). The potential for significant dust generation is also reliant on threshold wind speeds of greater than 10 m/s (19.4 knots) (at 7m above ground) to release loose material from storage piles and other exposed materials (USEPA, 1986). Particular care should be taken during periods of high winds (gales) as these are periods where the potential for significant dust emissions are highest. The prevailing meteorological conditions in the vicinity of the site are favourable in general for the suppression of dust for a significant period of the year. Nevertheless, there will be infrequent periods were care will be needed to ensure that dust nuisance does not occur. The following measures shall be taken in order to avoid dust nuisance occurring under unfavourable meteorological conditions:

- The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised;
- During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions;
- The name and contact details of a person to contact regarding air quality and dust issues shall be displayed on the site boundary, this notice board should also include head/regional office contact details;
- It is recommended that community engagement be undertaken before works commence on site explaining the nature and duration of the works to local residents and businesses;
- A complaints register will be kept on site detailing all telephone calls and letters of complaint received in connection with dust nuisance or air quality concerns, together with details of any remedial actions carried out;
- It is the responsibility of the contractor at all times to demonstrate full compliance with the dust control conditions herein;
- At all times, the procedures put in place will be strictly monitored and assessed.

The dust minimisation measures shall be reviewed at regular intervals during the works to ensure the effectiveness of the procedures in place and to maintain the goal of minimisation of dust through the use of best practice and procedures. In the event of dust nuisance occurring outside the site boundary, site activities will be reviewed and satisfactory procedures implemented to rectify the problem. Specific dust control measures to be employed are described below.

Preparing and Maintaining the Site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.
- Fully enclose specific operations where there is a high potential for dust production, and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have 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.

- Cover, seed or fence stockpiles to prevent wind whipping.

Operating Vehicles / Machinery and Sustainable Travel

- Ensure all vehicles switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Impose and signpost a maximum-speed-limit of 20 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.
- Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Waste Management

- Avoid bonfires and the burning of waste materials.

Measures Specific to Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Only remove the cover in small areas during work and not all at once.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.

- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.

Measures Specific to Trackout

Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK ODPM, 2002).

- A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles.
- Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use. If sweeping using a road sweeper is not possible due to the nature of the surrounding area then a suitable smaller scale street cleaning vacuum will be used.
- Avoid dry sweeping of large areas.
- Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
- Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- Record all inspections of haul routes and any subsequent action in a site log book.
- Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.
- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
- Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
- Access gates to be located at least 10 m from receptors where possible.

Summary of Dust Mitigation Measures

The pro-active control of fugitive dust will ensure that the prevention of significant emissions, rather than an inefficient attempt to control them once they have been released, will contribute towards the satisfactory performance of the contractor. The key features with respect to the control of dust will be:

- The specification of a site policy on dust and the identification of the site management responsibilities for dust issues;
- The development of a documented system for managing site practices with regard to dust control;
- The development of a means by which the performance of the dust minimisation measures can be regularly monitored and assessed; and
- The specification of effective measures to deal with any complaints received.

7.8.2 Operational Phase Mitigation

The impact of the operational traffic associated with proposed development on air quality is predicted to be imperceptible with respect to the operational phase in the long term. Therefore, no site-specific mitigation measures are required.

7.8.3 Cumulative Mitigation

The construction phase mitigation measures proposed for this application are in line with those proposed for the Phase 3 development. Therefore, no additional measures are required.

7.9 Residual Impact Assessment

7.9.1 Construction Phase

7.9.1.1 Air Quality

Once the dust minimisation measures outlined in Section 7.8.1 are implemented, the impact of the proposed development in terms of dust soiling will be short-term, negative, localised and imperceptible at nearby receptors.

7.9.1.2 Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active control of dust and other air pollutants to minimise generation of emissions at source. The mitigation measures that will be put in place during construction of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development will be negative, short-term and imperceptible with respect to human health.

7.9.2 Operational Phase

7.9.2.1 Air Quality

Air dispersion modelling of operational traffic emissions associated with the proposed development was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO_2, PM_{10} and $PM_{2.5}$ at nearby sensitive receptors as a result of the proposed development will be imperceptible. Therefore, the operational phase impact to air quality is long-term, direct, localised and imperceptible.

7.9.2.2 Human Health

As the air dispersion modelling has shown, emissions of air pollutants are significantly below the ambient air quality standards which are based on the protection of human health, impacts to human health are long-term, direct and imperceptible.

7.9.3 Cumulative Impact

7.9.3.1 Construction Phase

According to the IAQM guidance (2014) should the construction phase of the proposed development coincide with the construction phase of any other developments within 350m then there is the potential for cumulative construction dust related impacts to nearby sensitive receptors. However, provided the mitigation measures outlined in Section 7.8, are implemented throughout the construction phase of the proposed development significant cumulative dust impacts are not predicted.

7.9.3.2 Operational Phase

The traffic data used to assess the operational stage impacts to air quality included the cumulative traffic associated with the proposed development as well as other existing and permitted developments in the local area (see Chapter 12 'Material Assets: Traffic and Transport'). Therefore, the cumulative impact is included within the operational stage impact for the proposed development. The impact is predicted to be long-term and imperceptible with regards to air quality.

7.10 Risk of Major Accidents or Disasters

There are no likely risks of major accidents and disasters in relation to air quality associated with the proposed development and the masterplan development due to the nature and scale of the development. The proposed development is residential in nature and will not require large scale quantities of hazardous materials or fuels.

7.11 Significant Interactions

Air quality does not have a significant number of interactions with other topics. The most significant interactions are between population and human health and air quality. An adverse impact due to air quality in either the construction or operational phase has the potential to cause health and dust nuisance issues. The mitigation measures that will be put in place at the proposed development will ensure that the impact of the proposed development complies with all ambient air quality legislative limits. Therefore, the predicted impact is short-term, imperceptible and negative with respect to population and human health during construction and long-term, imperceptible and neutral during operation phase.

Interactions between air quality and traffic (Chapter 12) can be significant. With increased traffic movements and reduced engine efficiency, i.e. due to congestion, the emissions of vehicles increase. The impacts of the proposed development on air quality are assessed by reviewing the change in annual average daily traffic on roads close to the site. In this assessment, the impact of the interactions between traffic and air quality are considered to be long-term, imperceptible and neutral.

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Change Chapter (Chapter 8). There is no impact on climate due to air quality however the sources of impacts on air quality and climate are strongly linked.

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.

As set out in Chapter 5 (Land, Soils & Geology), dust generation can occur during extended dry weather periods as a result of construction traffic. Dust suppression measures (e.g. dampening down) will be implemented as necessary during dry periods and vehicle wheel washes will be installed, for example. The works involve stripping of topsoil and excavations, which will remove some vegetation such as trees and scrub. It will also generate dust and potentially impact on the air quality in the locality. However, the generation of dust will be temporary during construction phase and is not anticipated to have a significant impact on biodiversity.

The impact of the interactions between land, climate, soils and geology, biodiversity and air quality are considered to be short-term, imperceptible and neutral.

No other significant interactions with air quality have been identified.

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Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 8

Climate Change

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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8 Climate

8.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects on climate associated with the proposed development at Rathgowan, Mullingar, Co. Westmeath.

8.2 Expertise & Qualifications

This chapter was completed by Aisling Cashell, an Environmental Consultant in the air quality section of AWN Consulting Ltd. She holds a BA and an MAI in Civil, Structural and Environmental Engineering from Trinity College Dublin. She is a member of Engineers Ireland. She has experience in mapping software, primarily in ArcGIS and she specialises in the area of air quality, climate and sustainability.

Ciara Nolan assisted in drafting and reviewing this chapter. She is a Senior Environmental Consultant in the air quality section of AWN Consulting Ltd. She holds an MSc. (First Class) in Environmental Science from University College Dublin and has also completed a BSc. in Energy Systems Engineering. She is a Member of both the Institute of Air Quality Management (MIAQM) and the Institution of Environmental Science (MIEnvSc). She has over 6 years of experience in undertaking air quality and climate assessments. She has prepared air quality and climate impact assessments as part of EIARs for numerous developments including residential, industrial, commercial, pharmaceutical and data centres.

8.3 Proposed Development

The proposed development will consist of a mix of residential units, landscaping and amenity areas and all associated infrastructure works. A full description of the development can be found in Chapter 2 of this EIAR.

The proposed development comprises Phase 1 and Phase 2 of a wider masterplan development; Phase 1 and Phase 2 are located to the east of the R394 with Phase 3 located to the west of the R394. A planning application for Phase 3 was submitted to Westmeath County Council previously. The data pertaining to the Phase 3 application has been reviewed as part of the current assessment and used to inform the cumulative impact assessment.

8.3.1 Aspects Relevant to this Assessment

During the construction phase engine emissions from site vehicles and machinery have the potential to impact climate through the release of CO_2 and to a lesser extent, other greenhouse gases (GHGs). Embodied carbon of materials used in the construction of the development along with site activities will impact climate. Impacts to climate are assessed against Ireland's obligations under the EU 2030 GHG targets and sectoral emissions ceilings.

Engine emissions from vehicles accessing the site have the potential to impact climate during the operational phase of the development through the release of CO_2. Operational phase impacts will be

long-term in duration. In addition, the vulnerability of the proposed development in relation to future climate change must be considered during the operational phase. The proposed development has been designed to minimise the impact on climate where possible in line with the most recent development guidelines (Part L of the Building Regulations 2022) and in reference to measures within the Climate Action Plan 2022 (Government of Ireland 2022).

8.4 Methodology

8.4.1 Relevant Legislation & Guidance

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);
- Advice Note on Preparing Environmental Impact Statements – Draft (EPA, 2015);
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (European Commission, 2013);
- European Union (EU) Directive 2011/92/EU (as amended by Directive 2014/52/EU) on the assessment of the effects of certain public and private projects on the environment (the EIA Directive);
- European Union (EU) Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law');
- 2030 Climate and Energy Policy Framework (European Commission 2014);
- 2030 EU Climate Target Plan (European Commission, 2021b);
- Climate Action and Low Carbon Development (Amendment) Act 2021 (the 2021 Climate Act) (No. 32 of 2021) (Government of Ireland, 2021b).
- Climate Action Plan 2023 (Government of Ireland, 2022);
- Assessing Greenhouse Gas Emissions and Evaluating their Significance (Institute of Environmental Management & Assessment (IEMA), 2022);
- PE-ENV-01104: Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching Technical Document (Transport Infrastructure Ireland (TII), 2022a);
- UK 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)

8.4.2 Site Surveys/Investigation

No surveys were required as part of the climate assessment.

8.4.3 Consultation

A Section 247 and a Section 32B meeting were held with the Council; additional consultation with specific relevant bodies was not required as part of the climate assessment.

8.4.4 Criteria for Rating of Impacts

8.4.4.1 Climate Agreements and Policies

In 2015, the Climate Action and Low Carbon Development Act 2015 (No. 46 of 2015) (Government of Ireland, 2015) was enacted (the Act). The purpose of the Act was to enable Ireland '*to pursue, and achieve, the transition to a low carbon, climate resilient and environmentally sustainable economy by the end of the year 2050'* (3.(1) of No. 46 of 2015). This is referred to in the Act as the 'national transition objective'. The Act made provision for a national mitigation plan, and a national adaptation framework. In addition, the Act provided for the establishment of the Climate Change Advisory Council with the function to advise and make recommendations on the preparation of the national mitigation and adaptation plans and compliance with existing climate obligations.

The first Climate Action Plan (CAP) was published by the Irish Government in June 2019 (Government of Ireland, 2019). The Climate Action Plan 2019 outlined the current status across key sectors including Electricity, Transport, Built Environment, Industry and Agriculture and outlined the various broadscale measures required for each sector to achieve ambitious decarbonisation targets. The 2019 CAP also detailed the required governance arrangements for implementation including carbon-proofing of policies, establishment of carbon budgets, a strengthened Climate Change Advisory Council and greater accountability to the Oireachtas. The Government published the second Climate Action Plan in November 2021 (Government of Ireland, 2021a) and a third update in December 2022 (Government of Ireland, 2022) with an Annex of Action published in March 2023.

Following on from Ireland declaring a climate and biodiversity emergency in May 2019, and the European Parliament approving a resolution declaring a climate and environment emergency in Europe in November 2019, the Government approved the publication of the General Scheme in December 2019, followed by the publication of the Climate Action and Low Carbon Development (Amendment) Bill 2021 (hereafter referred to as the 2021 Climate Bill) in March 2021. The Climate Act was signed into Law on the 23rd July 2021, giving statutory effect to the core objectives stated within the CAP.

The purpose of the 2021 Climate Act (Government of Ireland, 2021b) is to provide for the approval of plans "for the purpose of pursuing the transition to a climate resilient, biodiversity rich and climate neutral economy by no later than the end of the year 2050". The 2021 Climate Act will also "provide for carbon budgets and a decarbonisation target range for certain sectors of the economy". The 2021 Climate Act defines the carbon budget as "the total amount of greenhouse gas emissions that are permitted during the budget period".

In relation to carbon budgets, the 2021 Climate Action and Low Carbon Development (Amendment) Act states '*A carbon budget, consistent with furthering the achievement of the national climate objective, shall be proposed by the Climate Change Advisory Council, finalised by the Minister and approved by the Government for the period of 5 years commencing on the 1 January 2021 and ending on 31 December 2025 and for each subsequent period of 5 years (in this Act referred to as a 'budget period')*'. The carbon budget is to be produced for 3 sequential budget periods, as shown in Table 8.1. The carbon budget can be revised where new obligations are imposed under the law of the European Union or international agreements or where there are significant developments in scientific knowledge in relation to climate change. In relation to the sectoral emissions ceiling, the Minister for the Environment, Climate and Communications (the Minister for the Environment) shall prepare and submit to government the maximum amount of Greenhouse Gas (GHG) emissions that are permitted in different sectors of the economy during a budget period and different ceilings may apply to different sectors. The sectorial emission ceilings for 2030 were published in July 2022 and are shown in Table 8.2. Industry and Buildings (Residential) have a 35% and 40% reduction requirement respectively and a 2030 emission ceiling of 4 Mt CO_{2eq}[1].

Table 8.1 5-Year Carbon Budgets 2021-2025, 2026-2030 and 2031-2025

Sector	Reduction Required	2018 Emissions (Mt CO_2eq)
2021-2025	295 Mt CO_2eq	Reduction in emissions of 4.8% per annum for the first budget period.
2026-2030	200 Mt CO_2eq	Reduction in emissions of 8.3% per annum for the second budget period.
2031-2035	151 Mt CO_2eq	Reduction in emissions of 3.5% per annum for the third provisional budget.

Note 1 Table derived Department of the Taoiseach press release 28 July 2022 from Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change

[1] Mt CO_{2eq} denotes million tonnes carbon dioxide equivalent.

Table 8.2 Sectoral Emission Ceilings 2030

Sector	Reduction Required	2018 Emissions (Mt CO_2eq)	2030 Emission Ceiling (Mt CO_2eq)
Electricity	75%	10.5	3
Transport	50%	12	6
Buildings (Commercial and Public)	45%	2	1
Buildings (Residential)	40%	7	4
Industry	35%	7	4
Agriculture	25%	23	17.25
Other (F-Gases, Waste and Petroleum refining)	50%	2	1

Note 1 Table derived Department of the Taoiseach press release 28 July 2022 from Government announces sectoral emissions ceilings, setting Ireland on a pathway to turn the tide on climate change

In December 2022, CAP23 was published (Government of Ireland 2022). This is the first CAP since the publication of the carbon budgets and sectoral emissions ceilings, and it aims to implement the required changes to achieve a 51% reduction in carbon emissions by 2030. The CAP has six vital high impact sectors where the biggest savings can be made: renewable energy, energy efficiency of buildings, transport, sustainable farming, sustainable business and change of land-use. CAP23 states that the decarbonisation of Ireland's manufacturing industry is key for Ireland's economy and future competitiveness. There is a target to reduce the embodied carbon in construction materials by 10% for materials produced and used in Ireland by 2025 and by at least 30% for materials produced and used in Ireland by 2030. CAP23 states that these reductions can be brought about by product substitution for construction materials and reduction of clinker content in cement. Cement and other high embodied carbon construction elements can be reduced by the adoption of the methods set out in the Construction Industry Federation 2021 report Modern Methods of Construction. In order to ensure economic growth can continue alongside a reduction in emissions, the IDA Ireland will also seek to attract businesses to invest in decarbonisation technologies.

8.4.4.2 Climate Assessment Significance Criteria

The climate assessment is divided into two distinct sections – a greenhouse gas assessment (GHGA) and a climate change risk assessment (CCRA).

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

The significance criteria for each assessment are described below.

8.4.4.2.1 Significance Criteria for GHGA

The Transport Infrastructure Ireland (TII) guidance document entitled *PE-ENV-01104 Climate Guidance for National Roads, Light Rail and Rural Cycleways (Offline & Greenways) – Overarching*

Technical Document (TII 2022a) outlines a recommended approach for determining the significance of both the construction and operational phases of a development. The approach is based on comparing the '*Do Something*' scenario and the net project GHG emissions (i.e. *Do Something – Do Minimum*) to the relevant carbon budgets (Department of the Taoiseach 2022). With the publication of the Climate Action Act in 2021, sectoral carbon budgets have been published for comparison with the Net CO_2 project GHG emissions from the proposed development. The Industry and Buildings (Residential) sectors emitted approximately 7 Mt CO_{2eq} in 2018 and has a ceiling of 4 Mt CO_{2eq} in 2030 which is a 35% reduction over this period (see Table 8.2).

The significance of GHG effects set out in PE-ENV-01104 (TII, 2022a) is based on IEMA guidance (IEMA, 2022) which is consistent with the terminology contained within Figure 3.4 of the EPA's (2022) 'Guidelines on the information to be contained in Environmental Impact Assessment Reports'.

The 2022 IEMA Guidance (IEMA, 2022) sets out the following principles for significance:

- When evaluating significance, all new GHG emissions contribute to a negative environmental impact; however, some projects will replace existing development or baseline activity that has a higher GHG profile. The significance of a project's emissions should therefore be based on its net impact over its lifetime, which may be positive, negative or negligible;
- Where GHG emissions cannot be avoided, the goal of the EIA process should be to reduce the project's residual emissions at all stages; and
- Where GHG emissions remain significant, but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

The criteria for determining the significance of effects are a two-stage process that involves defining the magnitude of the impacts and the sensitivity of the receptors (i.e. Ireland's National GHG targets). In relation to climate, there is no project specific assessment criteria, but the project will be assessed against the recommended IEMA significance determination. This takes account of any embedded or committed mitigation measures that form part of the design which should be considered.

TII (TII, 2022a) states that professional judgement must be taken into account when contextualising and assessing the significance of a project's GHG impact. In line with IEMA Guidance (IEMA, 2022), TII 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*[2] *by 2050*".

Significance is determined using the criteria outlined in

Table 8.3 (derived from Table 6.7 of PE-ENV-01104 (TII, 2022a)) along with consideration of the following two factors:

[2] Net Zero: "*When anthropogenic emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.*" Net zero is achieved where emissions are first educed in line with a 'science-based' trajectory with any residual emissions neutralised through offsets.

- The extent to which the trajectory of GHG emissions from the project aligns with Ireland's GHG trajectory to net zero by 2050; and
- The level of mitigation taking place.

Table 8.3 GHGA Significance Criteria

Effects	Significance Level	Description
Significant adverse	Major adverse	▪ The project's GHG impacts are not mitigated. ▪ The project has not complied with do-minimum standards set through regulation, nor provided reductions required by local or national policies; and ▪ No meaningful absolute contribution to Ireland's trajectory towards net zero.
	Moderate adverse	▪ The project's GHG impacts are partially mitigated. ▪ The project has partially complied with do-minimum standards set through regulation, and have not fully complied with local or national policies; and ▪ Falls short of full contribution to Ireland's trajectory towards net zero.
Not Significant	Minor adverse	▪ The project's GHG impacts are mitigated through 'good practice' measures. ▪ The project has complied with existing and emerging policy requirements; and ▪ Fully in line to achieve Ireland's trajectory towards net zero.
	Negligible	▪ The project's GHG impacts are mitigated beyond design standards. ▪ The project has gone well beyond existing and emerging policy requirements; and ▪ Well 'ahead of the curve' for Ireland's trajectory towards net zero.
Beneficial	Beneficial	▪ The project's net GHG impacts are below zero and it causes a reduction in atmosphere GHG concentration. ▪ The project has gone well beyond existing and emerging policy requirements; and ▪ Well 'ahead of the curve' for Ireland's trajectory towards net zero, provides a positive climate impact.

8.4.4.2.2 Significance Criteria for CCRA

The CCRA involves an initial screening assessment to determine the vulnerability of the proposed development to various climate hazards. The vulnerability is determined by combining the sensitivity and the exposure of the proposed development to various climate hazards.

Vulnerability = Sensitivity x Exposure

The vulnerability assessment takes any proposed mitigation into account. Table 8.4 details the vulnerability matrix; vulnerabilities are scored on a high, medium and low scale. Where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

Table 8.4 Vulnerability Matrix

		Exposure		
		High (3)	Medium (2)	Low (1)
Sensitivity	High (3)	9 - High	6 – High	3 - Medium
	Medium (2)	6 - High	4 - Medium	2 - Low
	Low (1)	3 - Medium	2 – Low	1 - Low

8.4.5 Construction Phase Methodology

8.4.5.1 Greenhouse Gas Assessment

As per the EU guidance document *Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment* (European Commission, 2013) the climate baseline is first established with reference to EPA data on annual GHG emissions (see Section 8.6). The impact of the proposed development on climate is determined in relation to this baseline. As per the IEMA guidance (2022) where expected emissions will not increase by over 1% compared with the baseline scenario then no further assessment is required as there is no potential for significant impacts to climate. The construction stage activities and potential for GHG emissions have been reviewed as part of the construction stage climate assessment and a qualitative assessment conducted.

8.4.6 Operational Phase Methodology

8.4.6.1 Climate Change Vulnerability Assessment

The operational phase assessment involves determining the vulnerability of the proposed development to climate change. This involves an analysis of the sensitivity and exposure of the development to climate hazards which together provide a measure of vulnerability.

PE-ENV-01104 (TII, 2022a) states that the CCRA is guided by the principles set out in the overarching best practice guidance documents:

- EU (2021) Technical guidance on the climate proofing of Infrastructure in the Period 2021-2027 (European Commission, 2021a); and
- The Institute of Environmental Management and Assessment, Environmental Impact Assessment Guide to: Climate Change Resilience and Adaptation (2nd Edition) (IEMA, 2020).

The baseline environment information provided in Section 8.6, future climate change modelling and input from other experts working on the proposed development (i.e. hydrologists) should be used in order to assess the likelihood of a climate risk.

The initial stage of an assessment is to establish a scope and boundary for the assessment taking into account the following criteria:

- **Spatial boundary**: As per PE-ENV-01104 (TII, 2022a), the study area with respect to the GHGA is Ireland's Climate budget. The study area with respect to the CCRA can be considered the project boundary and its assets. The study area will be influenced by current and future baselines (Section 8.6). This study area is influenced by the input of other experts within the EIAR team;
- **Climate hazards**: The outcomes of the climate screening i.e. vulnerability assessment and baseline assessment; and
- **Project receptors**: TII state that the project receptors are the asset categories considered in the climate screening. In addition, any critical connecting infrastructure and significant parts of the surrounding environment e.g. water bodies that should be considered as a part of the indirect, cumulative and in combination impact assessment should also be considered project receptors.

Technical guidance on the climate proofing of infrastructure in the period 2021-2027 (European Commission, 2021a) outlines an approach for undertaking a climate change risk assessment where there is a potentially significant impact on the proposed development due to climate change. The risk assessment assesses the likelihood and consequence of the impact occurring, leading to the evaluation of the significance of the impact. The role of the climate consultant in assessing the likelihood and impact is often to facilitate the climate change risk assessment process with input from the design team or specific specialists such as hydrology.

The climate screening risk assessment or vulnerability assessment is carried out by determining the sensitivity and exposure of the project to climate change. Firstly the project asset categories must be assigned a level of sensitivity to climate hazards irrespective of the project location (example: Sea level rise will affect seaport projects regardless of specific location). PE-ENV-01104 (TII, 2022a) provide the below list of asset categories and climate hazards to be considered. The asset categories will vary for project type and need to be determined on a project by project basis.

- **Asset categories** - Pavements; drainage; structures; utilities; landscaping; signs, light posts, buildings, and fences.

- **Climate hazards** - Flooding (coastal, pluvial, fluvial); extreme heat; extreme cold; wildfire; drought; extreme wind; lightning and hail; landslides; fog.

The sensitivity is based on a High, Medium or Low rating with a score of 1 to 3 assigned as per the criteria below.

- **High sensitivity:** The climate hazard will or is likely to have a major impact on the asset category. This is a sensitivity score of 3.

- **Medium sensitivity:** It is possible or likely the climate hazard will have a moderate impact on the asset category. This is a sensitivity score of 2.

- **Low sensitivity:** It is possible the climate hazard will have a low or negligible impact on the asset category. This is a sensitivity score of 1.

Once the sensitivities have been identified the exposure analysis is undertaken. The exposure analysis involves determining the level of exposure of each climate hazard at the project location irrespective of the project type for example: flooding could be a risk if the project location is next to a river in a floodplain. Exposure is assigned a level of High, Medium or Low as per the below criteria.

- **High exposure:** It is almost certain or likely this climate hazard will occur at the project location i.e. might arise once to several times per year. This is an exposure score of 3.
- **Medium exposure:** It is possible this climate hazard will occur at the project location i.e. might arise a number of times in a decade. This is an exposure score of 2.
- **Low exposure:** It is unlikely or rare this climate hazard will occur at the project location i.e. might arise a number of times in a generation or in a lifetime. This is an exposure score of 1.

Once the sensitivity and exposure are categorised, a vulnerability analysis is conducted by multiplying the sensitivity and exposure to calculate the vulnerability, as shown in Table 8.4. TII guidance (TII, 2022a) and the EU technical guidance (European Commission, 2021a) note that if all vulnerabilities are ranked as low in a justified manner, no detailed climate risk assessment may be needed. The impact from climate change on the proposed development can therefore considered to be not significant. However, where residual medium or high vulnerabilities exist the assessment may need to be progressed to a detailed climate change risk assessment and further mitigation implemented to reduce risks.

8.4.6.2 Climate and Traffic Emissions

Emissions from road traffic associated with the proposed development have the potential to emit carbon dioxide (CO_2) which will impact climate.

The UK Highways Agency DMRB guidance document in relation to climate impact assessments *LA 114 Climate* (UK Highways Agency, 2019) contains the following scoping criteria to determine whether a detailed climate assessment is required for a proposed project during the operational stage. If any of the road links impacted by the proposed development meet or exceed the below criteria, then further assessment is required.

- A change of more than 10% in AADT;
- A change of more than 10% to the number of heavy duty vehicles; and
- A change in daily average speed of more than 20 km/hr.

There are a small number of road links that will experience a change of over 10% in the AADT during the operational phase as a result of the proposed development. As a result a detailed assessment of traffic related carbon dioxide (CO_2) emissions was conducted.

PE-ENV-01104 (TII, 2022c) states that road traffic related emissions information should be obtained from an Air Quality Practitioner to show future user emissions during operation without the development in place. The Air Quality Practitioner calculated the traffic related emissions through the use of the TII REM tool (TII, 2022b) which includes detailed fleet predictions for age, fuel technology, engine size and weight based on available national forecasts. The output is provided in terms of CO_2eq for the Base Year 2022, Opening Year 2026 and Design Year 2041. Both the Do Nothing and Do

Something scenarios are quantified in order to determine the degree of change in emissions as a result of the proposed development. Traffic data was obtained from TOBIN Consulting Engineers for the purpose of this assessment. Inputs include light duty vehicle (LDV) annual average daily traffic movements (AADT), annual average daily heavy duty vehicles (HDV AADT), annual average traffic speeds, road link lengths, road type and project county location. See Chapter 7 Air Quality and Chapter 12 Material Assets – Transport for further details on the traffic data.

8.5 Difficulties Encountered

There were no significant difficulties encountered in compiling the specified information for this EIA chapter.

8.6 Baseline Environment

PE-ENV-01104 (TII, 2022c) states that a baseline climate scenario should identify, consistent with the study area for the project, GHG emissions without the project for both the current and future baseline.

Ireland declared a climate and biodiversity emergency in May 2019 and in November 2019 there was European Parliament approval of a resolution declaring a climate and environment emergency in Europe. This, in addition to Ireland's current failure to meet its EU binding targets under Regulation 2018/842 (European Union, 2018) results in changes in GHG emissions either beneficial or adverse being of more significance than previously considered prior to these declarations.

8.6.1 Greenhouse Gas Emissions

Data published in 2022 (EPA, 2022b) predicts that Ireland exceeded (without the use of flexibilities) its 2021 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 3.29 Mt CO_2eq. The sectoral breakdown of 2021 GHG emissions is shown in Table 8.5. The sector with the highest emissions in 2021 was agriculture at 38% of the total, followed by transport at 17.7%. For 2021 total national emissions (excluding LULUCF) were estimated to be 62.11 Mt CO_2eq as shown in Table 8.5 (EPA, 2022b).

The future baseline with respect to the GHGA can be considered in relation to the future climate targets which the assessment results will be compared against. In line with TII (TII, 2022c) and IEMA Guidance (IEMA, 2022) the future baseline is a trajectory towards net zero by 2050, "*whether it* [the project] *contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*".

The future baseline will be determined by Ireland meeting its targets set out in the CAP23, and future CAPs, alongside binding 2030 EU targets. In order to meet the commitments under the Paris Agreement, the European Union (EU) enacted 'Regulation (EU) 2018/842 on binding annual GHG emission reductions by Member States from 2021 to 2030 contributing to climate action to meet commitments under the Paris Agreement and amending Regulation (EU) No. 525/2013' (hereafter referred to as the Regulation) (European Union, 2018). The Regulation aims to deliver, collectively by the EU in the most cost-effective manner possible, reductions in GHG emissions from the Emission Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30%, respectively, by 2030

compared to 2005. The ETS is an EU-wide scheme which regulates the GHG emissions of larger industrial emitters including electricity generation, cement manufacturing and heavy industry. The non-ETS sector includes all domestic GHG emitters which do not fall under the ETS scheme and thus includes GHG emissions from transport, residential and commercial buildings and agriculture.

Table 8.5 Total National GHG Emissions in 2021

Category	2021 Mt CO_2eq	% of Total GHG emissions
Agriculture	23.63	38.0%
Transport	10.99	17.7%
Energy Industries	10.27	16.5%
Residential	6.92	11.1%
Manufacturing Combustion	4.62	7.4%
Industrial Processes	2.48	4.0%
F-Gases	0.77	1.2%
Commercial Services	0.84	1.3%
Public Services	0.66	1.1%
Waste	0.94	1.5%
Total	**62.11**	**100.0%**

8.6.2 Climate Change Vulnerability

Impacts as a result of climate change will evolve with a changing future baseline, changes have the potential to include increases in global temperatures and increases in the number of rainfall days per year. Therefore, it is expected that the baseline climate will evolve over time and consideration is needed with respect to this within the design of the proposed development.

Ireland has seen increases in the annual rainfall in the north and west of the country, with small increases or decreases in the south and east including in the region where the proposed development will be located (EPA, 2021b). The EPA have compiled a list of potential adverse impacts as a result of climate change including the following which may be of relevance to the proposed development (EPA, 2021b):

- More intense storms and rainfall events;
- Increased likelihood and magnitude of river and coastal flooding;
- Water shortages in summer in the east;
- Adverse impacts on water quality; and
- Changes in distribution of plant and animal species.

The EPA's State of the Irish Environment Report (Chapter 2: Climate Change) (EPA, 2020c) notes that projections show that full implementation of additional policies and measures, outlined in the 2019 Climate Action Plan, will result in a reduction in Ireland's total GHG emissions by up to 25 per cent by 2030 compared with 2020 levels. Climate change is not only a future issue in Ireland, as a warming of approximately 0.8°C since 1900 has already occurred. The EPA state that it is critically important for the public sector to show leadership and decarbonise all public transport across bus and rail networks to the lowest carbon alternatives. The report (EPA, 2020c) underlines that the next decade needs to

be one of major developments and advances in relation to Ireland's response to climate change in order to achieve these targets and that Ireland must accelerate the rate at which it implements GHG emission reductions. The report states that mid-century mean annual temperatures in Ireland are projected to increase by between 1.0°C and 1.6°C (subject to the emissions trajectory). In addition, heat events are expected to increase by mid-century (EPA, 2020c). While individual storms are predicted to have more severe winds, the average wind speed has the potential to decrease (EPA, 2020c).

TII's Guidance document PE-ENV-01104 (TII, 2022c) states that for future climate change a moderate to high Representative Concentration Pathways (RCP) should be adopted. RPC4.5 is considered moderate while RPC8.5 is considered high. Representative Concentration Pathways (RCPs) describe different 21st century pathways of GHG emissions depending on the level of climate mitigation action undertaken.

Future climate predictions undertaken by the EPA have been published in 'Research 339: High-resolution Climate Projections for Ireland – A Multi-model Ensemble Approach (EPA 2020d). The future climate was simulated under both Representative Concentration Pathway 4.5 (RCP4.5) (medium-low) and RCP8.5 (high) scenarios. This study indicates that by the middle of this century (2041–2060), mid-century mean annual temperatures are projected to increase by 1 to 1.2°C and 1.3 to 1.6°C for the RCP4.5 and RCP8.5 scenarios, respectively, with the largest increases in the east. Warming will be enhanced at the extremes (i.e. hot days and cold nights), with summer daytime and winter night-time temperatures projected to increase by 1 to 2.4°C. There is a projected substantial decrease of approximately 50%, for the number of frost and ice days. Summer heatwave events are expected to occur more frequently, with the largest increases in the south. In addition, precipitation is expected to become more variable, with substantial projected increases in the occurrence of both dry periods and heavy precipitation events. Climate change also has the potential to impact future energy supply which will rely on renewables such as wind and hydroelectric power. Wind turbines need a specific range of wind speeds to operate within and droughts or low ground water levels may impact hydroelectric energy generating sites. More frequent storms have the potential to damage the communication networks requiring additional investment to create resilience within the network.

The EPA's Critical Infrastructure Vulnerability to Climate Change report (EPA, 2021b) assesses the future performance of Irelands critical infrastructure when climate is considered. With respect to road infrastructure, fluvial flooding and coastal inundation/coastal flooding are considered the key climate change risks with snowstorm and landslides being medium risks. Extreme winds and heatwaves/droughts are considered low risk to road infrastructure. One of the key outputs of the research was a framework that will provide quantitative risk-based decision support for climate change impacts and climate change adaptation analysis for infrastructure.

8.7 The 'Do Nothing' Scenario

Under the Do Nothing Scenario construction works associated with the Phase 1 and Phase 2 development will not take place. Impacts from increased traffic volumes and associated emissions from the proposed Phase 1 and Phase 2 development will also not occur. However, the proposed development is part of a wider masterplan site and a planning application for the Phase 3 development

has been submitted to Westmeath County Council. Impacts to climate associated with the Phase 3 development will still occur. Additionally, the climate baseline will continue to develop in line with the identified trends (see Section 8.6).

8.8 Potential Significant Effects

8.8.1 Construction Phase

8.8.1.1 Greenhouse Gas Assessment

There is the potential for greenhouse gas emissions to atmosphere during the construction of the development. As per the IEMA guidance (2022) where expected emissions will not increase by over 1% compared with the baseline scenario then no further assessment is required as there is no potential for significant impacts to climate. The baseline scenario has been determined in Section 8.6.1 by reference to Ireland's national GHG emissions for 2021. Total national GHG emissions (excluding LULUCF) were estimated to be 62.11 Mt CO_{2eq} in 2021 (EPA, 2022b). GHG emissions associated with the proposed development will be a small fraction of this and are unlikely to significantly alter the baseline.

8.8.1.2 Climate Change Risk Assessment

Examples of potential climate impacts are included in Annex D (Climate proofing and environmental impact assessment) of the technical guidance on the climate proofing of infrastructure (European Commission, 2021a). Potential impacts to the proposed development as a result climate change include:

- Flood Risk due to increased precipitation, and intense periods of rainfall. This includes fluvial and pluvial flooding;
- Increased temperatures potentially causing drought, wildfires and prolonged periods of hot weather;
- Reduced temperatures resulting in ice or snow;
- Geotechnical impacts; and
- Major Storm Damage – including wind damage.

Each of these potential risks are considered with respect to the operational phase of the proposed development as detailed in Section 8.8.2.1. During the construction phase no assessment is required however consideration will be given to the project's vulnerability to climate impacts. During construction, the Contractor will be required to mitigate against the effects of extreme rainfall / flooding through site risk assessments and method statements. The Contractor will also be required to mitigate against the effects of extreme wind / storms, temperature extremes through site risk assessments and method statements. All materials used during construction will be accompanied by certified datasheets which will set out the limiting operating temperatures. Temperatures can affect the performance of some materials, and this will require consideration during construction.

During construction, the Contractor will be required to mitigate against the effects of fog, lighting and hail through site risk assessments and method statements.

8.8.2 Operational Phase

8.8.2.1 Climate Change Risk Assessment

In order to determine the vulnerability of the proposed development to climate change the sensitivity and exposure of the development to various climate hazards must first be determined. The following climate hazards have been considered in the context of the proposed development: flooding (coastal, pluvial, fluvial), extreme heat, extreme cold, wildfire, drought, extreme wind, lightning, hail, landslides and fog. Wildfire and landslides were not considered relevant to the proposed development due to the project location and have been screened out of the assessment.

The sensitivity of the proposed development to the above climate hazards is assessed irrespective of the project location. Table 8.6 details the sensitivity of the proposed development on a scale of high (3), medium (2) and low (1). Once the sensitivity has been established the exposure of the proposed development to each of the climate hazards is determined, this is the likelihood of the climate hazard occurring at the project location and is also scored on a scale of high (3), medium (2) and low (1). The product of the sensitivity and exposure is then used to determine the overall vulnerability of the proposed development to each of the climate hazards as per Table 8.4. The results of the vulnerability assessment are detailed in Table 8.6.

Table 8.6 Climate Change Vulnerability Assessment

Climate Hazard	Sensitivity	Exposure	Vulnerability
Flooding (Coastal, Pluvial, Fluvial)	1 (Low)	1 (Low)	1 (Low)
Extreme Heat	1 (Low)	2 (Medium)	2 (Low)
Extreme Cold	1 (Low)	2 (Medium)	2 (Low)
Drought	1 (Low)	1 (Low)	2 (Low)
Extreme Wind	1 (Low)	1 (Low)	1 (Low)
Lightning & Hail	1 (Low)	1 (Low)	1 (Low)
Fog	1 (Low)	1 (Low)	1 (Low)

The proposed development has at most low vulnerabilities to the identified climate hazards. A Flood Risk Assessment prepared for the development applications states that flooding is not a risk at the project location. Adequate attenuation and drainage have been incorporated into the design of the development which allows for additional rainfall as a result of climate change thereby reducing the risk for the site.

In relation to extreme temperatures, both extreme heat and extreme cold, these have the potential to impact the building materials and some related infrastructure. However, the building materials

selected at the detailed design stage will be of high quality and durability. Therefore, extreme temperatures are not considered a significant risk.

8.8.2.2 Climate and Traffic Emissions

There is the potential for increased traffic volumes to impact climate during the operational phase. The predicted concentrations of CO_2 for the future years of 2025 and 2040 are detailed in Table 8.7. These are significantly less than the 2025 and 2030 targets set out under EU legislation (targets beyond 2030 are not available). It is predicted that in 2025 the proposed development will increase CO_2 emissions by 0.00020% of the EU 2025 target. Similarly low increases in CO_2 emissions are predicted to occur in 2040 with emissions increasing by 0.00017% of the EU 2030 target.

Table 8.7 Traffic Emissions GHG Impact Assessment

Year	Scenario	CO_2eq
		(tonnes/annum)
2025	Do Nothing	1,055
	Do Something	1,133
2040	Do Nothing	1,061
	Do Something	1,118
Increment in 2025		78
Increment in 2040		57
Emission Ceiling (Tonnes) 2025		**38,991,362**
Emission Ceiling (Tonnes) 2030		**33,381,312**
Impact in 2025 (%)		0.00020%
Impact in 2040 (%)		0.00017%

Note 1 Target under Commission Implementing Decision (EU) 2020/2126 of 16 December 2020 on setting out the annual emission allocations of the Member States for the period from 2021 to 2030 pursuant to Regulation (EU) 2018/842 of the European Parliament and of the Council

8.8.3 Cumulative Effects

With respect to the requirement for a cumulative assessment PE-ENV-01104 (TII, 2022c) states that *"for GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable*."

However, by presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential

for the project to affect Ireland's ability to meet its national carbon reduction target. Therefore, the assessment approach is considered to be inherently cumulative.

The traffic data used for the operational phase assessment included cumulative traffic from existing developments in the surrounding area and the full masterplan development. Therefore, this impact assessment is cumulative.

8.9 Mitigation

8.9.1 Construction Phase Mitigation

Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate:

- Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods.
- Ensure all plant and machinery are well maintained and inspected regularly.
- Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site.
- Waste materials will be re-used on site where possible and where re-use is not possible on-site they will be sent off-site for recycling, re-use or recovery.
- Sourcing materials locally where possible to reduce transport related CO_2 emissions.

8.9.2 Operational Phase Mitigation

A number of measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. These measures have been considered when assessing the vulnerability of the proposed development to climate change (see Section 8.8.2.1).

A number of incorporated design mitigation measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible. The development will be in compliance with the requirements of the Near Zero Energy Building (NZEB) Standards and will achieve a Building Energy Rating (BER) in line with the NZEB requirements. Renewable technologies will be implemented for the energy or heating requirements of the units to meet the RER of the NZEB requirements. Durable building material will be selected to prevent the need for frequent replacement or maintenance thereby reducing the embodied footprint of the development. These identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals of the Climate Change Action Plan.

8.9.3 Cumulative Mitigation

No specific cumulative mitigation is required.

8.10 Residual Impact Assessment

The impact to climate as a result of a proposed development must be assessed as a whole for all phases. The proposed development will result in some impacts to climate through the release of GHGs. TII state that the crux of assessing significance is "*not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050*". The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible. As per the assessment criteria in

Table **8.3** the impact of the proposed development in relation to GHG emissions is considered long-term, minor adverse and not significant.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change.

8.11 Risk of Major Accidents or Disasters

As detailed in Section 8.6, climate change has the potential to alter weather patterns and increase the frequency of rainfall in future years. However, the potential for flooding on site has been reviewed and adequate attenuation and drainage have been provided for to account for increased rainfall in future years. Therefore, the impact will be neutral and imperceptible.

8.12 Significant Interactions

Climate has the potential to interact with a number of other environmental attributes.

The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas in accordance with a minimum 1 in 100-year event plus 20% climate change allowance. 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. In addition, climate impacts will interact with the proposed developments design both with respect to embodied carbon but also through its vulnerability to future climate change impacts (e.g. wind loading, extreme temperatures). The building detailed design will be finalised with potential future climate hazards in mind. Building design will also take into account energy efficiency measures to reduce construction phase and operational carbon emissions. The impact of the interactions between design considerations (flood mitigation design, landscaping design and building design) and climate are considered to be long-term and significant.

Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts. Air quality modelling outputs are utilised within the Climate Chapter. There is no impact on climate due to air quality however the sources of impacts on air quality and climate are strongly linked.

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Transport Infrastructure Ireland (TII) (2022b) GE-ENV-01106: TII Carbon Assessment Tool for Road and Light Rail Projects and User Guidance Document

Transport Infrastructure Ireland (2022c) TII Roads Emissions Model (REM) and Model Development Report (GE-ENV-01107)

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Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 9

Noise & Vibration

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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9 Noise & Vibration

9.1 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 as detailed in relevant sections below.

This chapter includes a description of the receiving 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, on its surrounding environment. The assessment of direct, indirect and cumulative noise and vibration effects on the surrounding environment have been considered in this chapter.

Mitigation and monitoring measures are included, where relevant, to ensure the proposed development is constructed and operated in an environmentally sustainable manner in order to ensure minimal impact on the receiving environment.

9.2 Expertise & Qualifications

This assessment has been prepared by Mike Simms BE MEngSc MIOA MIET, Principal Acoustic Consultant at AWN, who 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, energy, industrial, commercial and residential. Recent relevant project experience where noise is an important element of the environmental assessment include:

- Player Wills and Bailey Gibson Strategic Housing Developments, Dublin 8;
- St Marnock's Bay Phase 1C, Portmarnock, Co Dublin;
- Havelock House mixed-use development, Ormeau Road, Belfast, and;
- Newtownmoyaghy housing development, Kilcock, County Kildare.

9.3 Proposed Development

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

9.3.1 Aspects Relevant to this Assessment

When considering a development of this nature, the potential noise and vibration impact on the surroundings is considered for each of two distinct stages:

- Construction Phase, and;
- Operational Phase.

The construction phase will involve site clearing and excavations, piling of foundations, services installations, construction of building frame and envelope landscaping and construction of internal

roads. This phase will generate the highest potential noise impact due to the works involved, however, the phase is short-term and expected to be completed within 24 months .

The primary sources of outward noise in the operational context are long-term and will comprise traffic movements to site using the existing road network and building services plant noise. These issues are discussed in the relevant sections of this Chapter.

9.4 Methodology

9.4.1 Relevant Legislation & Guidance

The assessment of effects has been undertaken with reference to the guidance documents listed below relating to environmental noise and vibration:

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (2022);
- British Standard Institute (BSI) BS 5228-1:2009 +A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (BSI, 2014);
- British Standard Institute (BSI) BS 5228-2:2009+A:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (BSI, 2014);
- British Standard Institute (BSI) BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (BSI, 1993);
- UK Department of Transport (UK DOT) Calculation of Road Traffic Noise (UK DOT, 1988);
- British Standard Institute (BSI) BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound;
- United Kingdom Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2 (UKHA, 2020);
- International Organization for Standardization (ISO) ISO 1996: 2017: Acoustics – Description, measurement, and assessment of environmental noise (ISO, 2017).
- World Health Organisation Environmental Noise Guidelines for the European Region, 2018
- Professional Practice Guidance on Planning & Noise (ProPG) Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH) (2017)
- Westmeath County Council Noise Action Plan 2018-2023
- Transport Infrastructure Ireland Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2014)

The study has been undertaken using the following methodology:

- An environmental noise survey has been undertaken in the vicinity of the subject site in order to characterise the existing baseline noise environment;
- A review of the most applicable standards and guidelines has been conducted 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 during the construction phase of the project at the nearest sensitive locations to the development site;
- Predictive calculations have been performed to assess the potential effects associated with the operation of the development at the most sensitive locations surrounding the development site,
- The inward noise impact has been assessed according to ProPG and appropriate acoustic performances of the building envelope are presented;
- A schedule of mitigation measures has been proposed to reduce, where necessary, the identified potential outward effects relating to noise and vibration from the proposed development.

9.4.1.1 Westmeath County Council Noise Action Plan

Westmeath County Council Noise Action Plan 2018-2023 states the following regarding its role in the planning process, on page 30:

> *Westmeath County Council will consider using the Planning Process, where necessary:*
>
> > *To integrate Noise Action Plans into the County Development Plan*
> >
> > *To integrate noise planning guidelines into planning processes to ensure that new developments take cognisance of noise pollution and noise mitigation*
> >
> > *To ensure that future developments are designed and constructed in such a way as to minimise noise disturbances.*
> >
> > *To incorporate any suitable National guidance on the treatment of noise into local policy.*

On page 27, possible mitigation measures in respect of noise are discussed:

Some examples of acoustical measures to tackle noise are given below:

Screening noise

a) Noise barriers are less effective at reducing disturbance than reducing the volume of traffic.

b) Roadside barriers can be erected at the boundaries of properties.

c) Local sources of noise pollution must be taken into account when planning and designing new residences.

d) Orientation of building

Soundproof Glazing

Soundproofing with dual or triple glazing or equivalent product is a possibility for further protection against noise.

Changing road surfaces

To a low noise surface and replacing rough paving with smooth asphalt.

These mitigation measures will be taken into account in the environmental noise assessment presented in this Chapter.

9.4.2 Construction Phase Assessment Criteria

9.4.2.1 Noise

There is no published statutory Irish guidance relating to the maximum permissible noise level that may be generated during the construction phase of a project. Local Authorities typically control construction activities by imposing limits on the hours of operation and consider noise limits at their discretion.

In order to set appropriate construction noise limits for the development site, reference has been made to *BS 5228 2009+A1 2014 Code of practice for noise and vibration control on construction and open sites*. Part 1 of this document Noise provides guidance on selecting appropriate noise criteria relating construction works.

The approach adopted here 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. This then sets a threshold noise value that, if exceeded at this location, indicates a potential significant noise impact is associated with the construction activities.

BS 5228-1:2009+A1:2014 sets out guidance on permissible noise levels relative to the existing noise environment. Table 9.1 sets out the values which, when exceeded, signify a significant effect at the facades of residential receptors.

Table 9.1 Example 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 (08:00 – 19:00) and Saturdays (08:00 – 14:00)	65	70	75
Evenings and weekends [D]	55	60	65
Night-time (23:00 to 07:00hrs)	45	50	55

A. Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values.
B. Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values.
C. Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values.
D. 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

It should be noted that this assessment method is only valid for residential properties.

For the appropriate periods (i.e. daytime, evening and night time) the ambient noise level is determined and rounded to the nearest 5 dB. Baseline monitoring carried out at the nearest noise sensitive locations and considered in this assessment indicate that Category A, as detailed in Table 9.1, is appropriate in this instance.

9.4.2.2 Vibration

There are two aspects to the issue of vibration that are addressed in the standards and guidelines: the risk of cosmetic or structural damage to buildings; and human perception of vibration. In the case of this development, vibration levels used for the purposes of evaluating building protection and human comfort are expressed in terms of Peak Particle Velocity (PPV) in mm/s.

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 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (BSI 2014); and
- British Standard BS 7385-2 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (BSI 1993).

BS 5228-2 and BS 7385-2 define the following thresholds for cosmetic damage to residential or light commercial buildings: PPV should be below 15 mm/s at 4 Hz to avoid cosmetic damage. This increases to 20 mm/s at 15 Hz and to 50 mm/s at 40 Hz and above. At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded. This is summarised in Table 9.2 below.

Table 9.2 Allowable Vibration during Construction Phase

Type of building	Peak component particle velocity in frequency range of predominant pulse	
	4 Hz to 15 Hz	15 Hz and above
Unreinforced or light framed structures. Residential or light commercial buildings.	15 mm/s at 4 Hz increasing to 20 mm/s at 15 Hz	20 mm/s at 15 Hz increasing to 50 mm/s at 40 Hz and above

9.4.3 Operational Phase Assessment Criteria

9.4.3.1 Additional Vehicular Traffic on Surrounding Roads

There are no specific guidelines or limits relating to traffic related sources along the local or surrounding roads. Given that traffic from the development will make use of existing roads already carrying traffic volumes, it is appropriate to assess the calculated increase in traffic noise levels that will arise because of vehicular movements associated with the development. In order to assist with the interpretation of the noise associated with additional vehicular traffic on public roads, Table 9.3, is taken from *Design Manual for Roads and Bridges LA 111 Sustainability & Environmental Appraisal. Noise and Vibration Rev 2* (2020),with the appropriate EPA Significance of Effect also noted.

Table 9.3 Significance in Change of Noise Level – Operational Phase Traffic

Change in Sound Level (dB)	Subjective Reaction	DMRB Magnitude of Impact	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	Significant
10+	Doubling of loudness and above	Major	Very significant

The guidance outlined in Table 9.3 will be used to assess the predicted increases in traffic levels on public roads associated with the proposed development and comment on the likely long-term effects during the operational phase.

9.4.3.2 Building Services Plant Noise

The most appropriate standard used to assess the impact of a new continuous source (i.e. plant items) to a residential environment is BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*. This standard describes a method for assessing the impact of a specific noise source at a specific location with respect to the increase in "background" noise level that the specific noise source generates. The standard provides the following definitions that are pertinent to this application:

- "*Specific sound level, $L_{Aeq,\ Tr}$*" is equivalent continuous A-weighted sound pressure level produced by the specific sound source at the assessment location over a given reference time interval, *T*. This level has been determined with reference to manufacturers information for specific plant items.
- *"Rating level"* $L_{Ar,Tr}$ is the specific noise level plus adjustments for the character features of the sound (if any), and;
- *"Background noise level"* is the sound A-weighted sound pressure level that is exceeded by the residual sound at the assessment location for 90% of a given time interval, T. This level is expressed using the L_{A90} parameter. These levels were measured as part of the baseline survey.

The assessment procedure in BS4142 is outlined as follows:

- determine the specific noise level;
- determine the rating level as appropriate;
- determine the background noise level, and;
- subtract the background noise level from the specific noise level in order to calculate the assessment level.

The lower the rating level is relative to the measured background sound level, the less likely it is that the specific source will have an adverse impact or a significant adverse impact. A difference of +10dB or more is a likely to be an indication of a significant adverse impact. A difference of around +5dB is likely to be an indication of an adverse impact, dependent on the context. Where the rated plant noise level is equivalent to the background noise level, noise effects are typically considered to be neutral.

9.4.3.3 Vibration

The development is a residential in nature, therefore it is not anticipated that there will be any outward impact associated with vibration for the operational phase.

9.4.4 Inward Noise Impact Criteria

The Professional Guidance on Planning & Noise (ProPG) document was published in May 2017. The document was prepared by a working group comprising members of the Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH). Although not a UK or Irish government document, since it's publication it has been generally considered as a best practice guidance and has been widely adopted in the absence of equivalent Irish guidance.

The ProPG outlines a systematic risk based 2-stage approach for evaluating noise exposure on prospective sites for residential development. The two primary stages of the approach can be summarised as follows:

- Stage 1 - Comprises a high level initial noise risk assessment of the proposed site considering either measured and or predicted noise levels; and,
- Stage 2 – Involves a full detailed appraisal of the proposed development covering four "key elements" that include:
    - Element 1 - Good Acoustic Design Process;

- Element 2 - Noise Level Guidelines;
- Element 3 - External Amenity Area Noise Assessment, and;
- Element 4 - Other Relevant Issues.

A summary of the ProPG approach is illustrated in **Figure 9.1**.

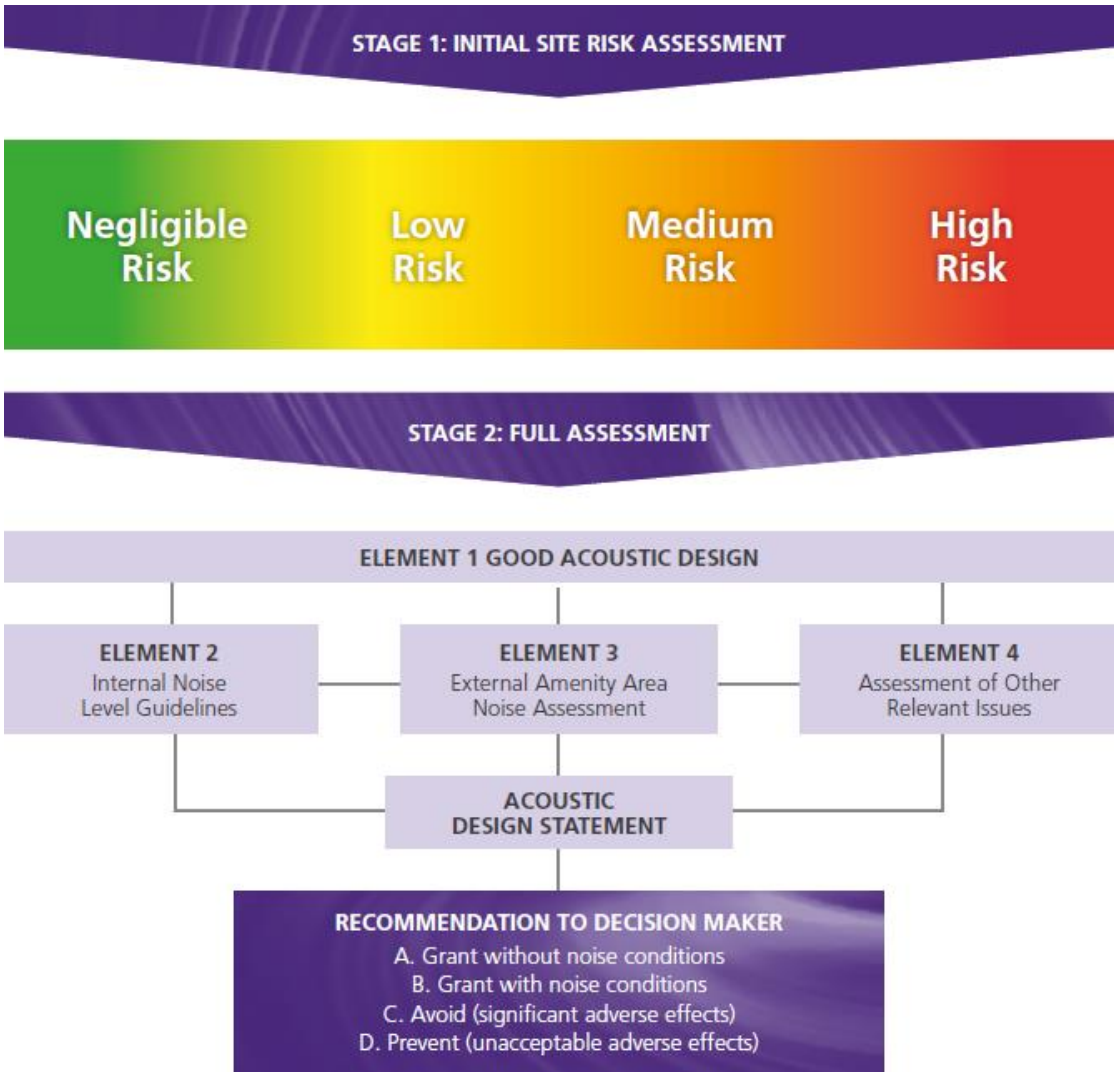

Figure 9.1 ProPG Approach (Source: ProPG)

The initial noise risk assessment is intended to provide an early indication of any acoustic issues that may be encountered. It calls for the categorisation of the site as a negligible, low, medium or high risk based on the pre-existing noise environment. Figure 9.2 presents the basis of the initial noise risk assessment; it provides appropriate risk categories for a range of continuous noise levels either measured and/or predicted on site.

It should be noted that a site should not be considered a negligible risk if more than 10 L_{AFmax} events exceed 60 dB during the night period and the site should be considered a high risk if the L_{AFmax} events exceed 80 dB more than 20 times a night.

Paragraph 2.9 of ProPG states that,

> *"The noise risk assessment may be based on measurements or prediction (or a combination of both) as appropriate and should aim to describe noise levels over a "typical worst case" 24 hour day either now or in the foreseeable future."*

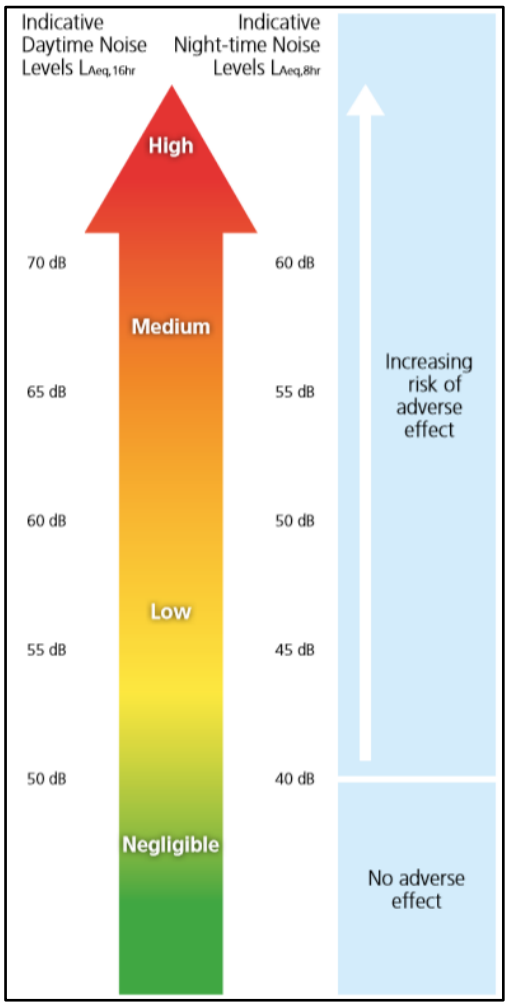

Figure 9.2 Initial Noise Risk Assessment

9.5 Difficulties Encountered

No difficulty was encountered in the preparation of this chapter.

9.6 Baseline Environment

9.6.1 Environmental Noise Survey

9.6.1.1 Site Location

The site is located to the northwest of the town centre. It is located to the northwest of the junction of the of the R394 and R393 roads. For the site layout and boundary please refer to Figure 1.1 in Chapter 1 of the EIAR.

9.6.1.2 Baseline Noise Survey Locations

An environmental noise survey was 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*.

The noise measurement locations were selected to represent the noise environment at Noise sensitive locations surrounding the proposed development. The selected locations are shown in Figure 9.3 and described as below:

- N1 – Attended noise measurements undertaken to the east of the proposed development site, at the western end of the Ashfield housing estate.
- N2 – Attended noise measurements undertaken near the south-eastern corner of the proposed development site, near the roundabout at the intersection of the R393 and R394 roads.
- N3 – Attended noise measurements undertaken near the norther boundary of the site, within the Brookfield housing estate.
- UN1 – Unattended noise measurements undertaken near the eastern boundary of the site.

Figure 9.3 Noise Monitoring Locations

9.6.1.3 Survey Periods

Attended surveys were conducted from 13:30 to 16:45 on Tuesday 20 September 2022. Over the course of the survey the weather was generally dry, calm and mild. Temperatures were approximately 10°C, wind speeds were approximately 4 to 5 m/s.

An unattended survey was carried out form 13:30 on 20 September to 14:15 on 22 September 2022.

9.6.1.4 Personnel and Instrumentation

AWN installed and collected the noise monitoring equipment. The following instrumentation was used in conducting the noise and surveys:

Table 9.4 Instrumentation Details

Equipment	Type	Serial Number	Calibration Date	Calibration Due
Sound Level Meter (Attended)	Rion NL-42	1076330	20/10/2020	20/10/2022
Sound Level Meter (Unattended)	Rion NL-42	998413	16/03/2022	16/03/2024

9.6.1.5 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_{A10} is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.

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 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 $2x10^{-5}$ Pa.

9.6.1.6 Attended Noise Survey Results

Noise level measurements of 15 minutes duration were taken at location N1 to N3. The results are presented in Table 9.5 to Table 9.7.

Table 9.5 Summary of Measurement Results for Location N1

Time	Subjective Impression of Noise Environment	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)			
		L_{Aeq}	L_{Amax}	L_{A10}	L_{A90}
13:38	Traffic Noise from R394	59	71	63	53
14:47	Occasional vehicle movements within housing estate	60	68	63	53
15:49	Birdsong	60	67	63	55

Noise levels were in the range 59 to 60 dB $L_{Aeq,15min}$ and 53 to 55 dB $L_{A90,15min}$. The main contributors to noise build-up were local and distant road traffic.

Table 9.6 Summary of Measurement Results for Location N2

Time	Subjective Impression of Noise Environment	Measured Noise Levels (dB re. 2x10^{-5} Pa)			
		L_{Aeq}	L_{Amax}	L_{A10}	L_{A90}
14:01	▪ Traffic Noise from R393 and R394 ▪ Pedestrian activity	64	74	68	56
15:01		67	79	71	57
16:01		65	79	68	58

Noise levels were in the range 64 to 67 dB $L_{Aeq,15min}$ and 56 to 58 dB $L_{A90,15min}$. The main contributor to noise build-up was road traffic on surrounding roads.

Table 9.7 Summary of Measurement Results for Location N3

Time	Subjective Impression of Noise Environment	Measured Noise Levels (dB re. 2x10^{-5} Pa)			
		L_{Aeq}	L_{Amax}	L_{A10}	L_{A90}
14:24	Local traffic from housing estate Distant traffic on Regional Roads Pedestrian Activity Increase in road traffic during last measurement period	49	70	48	39
15:27		47	71	43	38
16:30		51	66	52	47

Noise levels were in the range 47 to 51 dB $L_{Aeq,15min}$ and 38 to 47 dB $L_{A90,15min}$. The main contributors to noise build-up were local and distant road traffic.

9.6.1.7 Unattended Noise Survey Results

Measurement equipment was configured to record noise levels over consecutive 15-minture intervals. The equipment was check-calibrated using a sound level meter calibrator at the time of installation and again at collection.

Table 9.8 Summary of Measurement Results for Location UN1 - Daytime

Date	Measured Noise Levels (dB re. 2x10^{-5} Pa)					
	$L_{Aeq,15min}$			$L_{A90,15min}$		
	Highest	Lowest	Average	Highest	Lowest	Average
Tuesday 20 Sept	69	60	67	63	36	55
Wednesday 21 Sept	70	61	68	64	41	56
Thursday 22 Sept	70	66	68	65	48	58

Table 9.9 Summary of Measurement Results for Location UN1 – Night-time

Date	Measured Noise Levels (dB re. 2x10^{-5} Pa)					
	$L_{Aeq,15min}$			$L_{A90,15min}$		
	Highest	Lowest	Average	Highest	Lowest	Average
Tuesday 20 to Weds 21 Sept	66	45	59	49	25	31
Weds 21 to Thurs Sept	67	52	60	52	32	40

Figure 9.4 presents the time history of the unattended noise measurements:

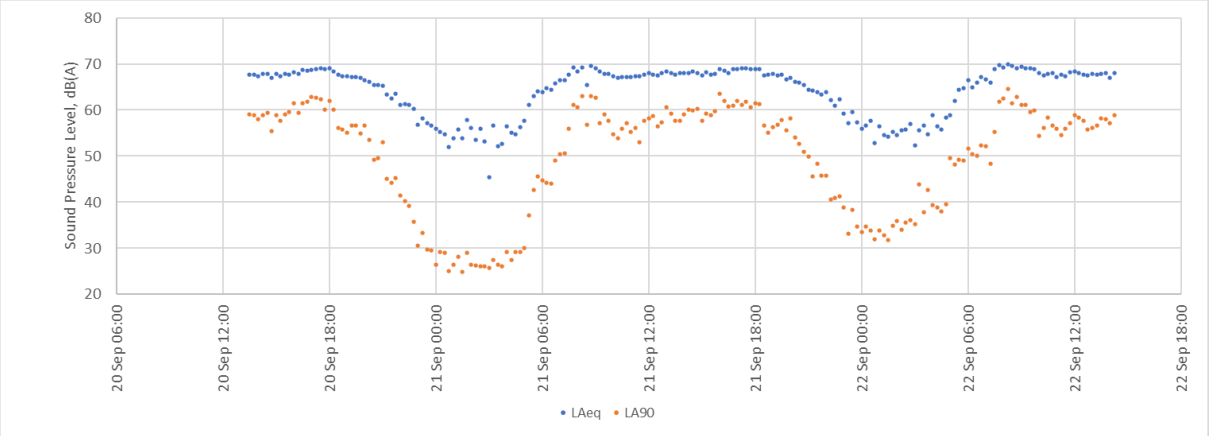

Figure 9.4 Noise Levels Measured by Unattended Sound Level Meter

The L_{AFmax} values were measured over 15-minute intervals over the duration of the unattended monitoring survey. Figure 9.5 presents the number of measured L_{AFmax} events for each decibel level during the night-time periods measured at location UN1. The data shows that a value of 76 dB $L_{AFmax, 15\ min}$ is not typically exceeded at this location.

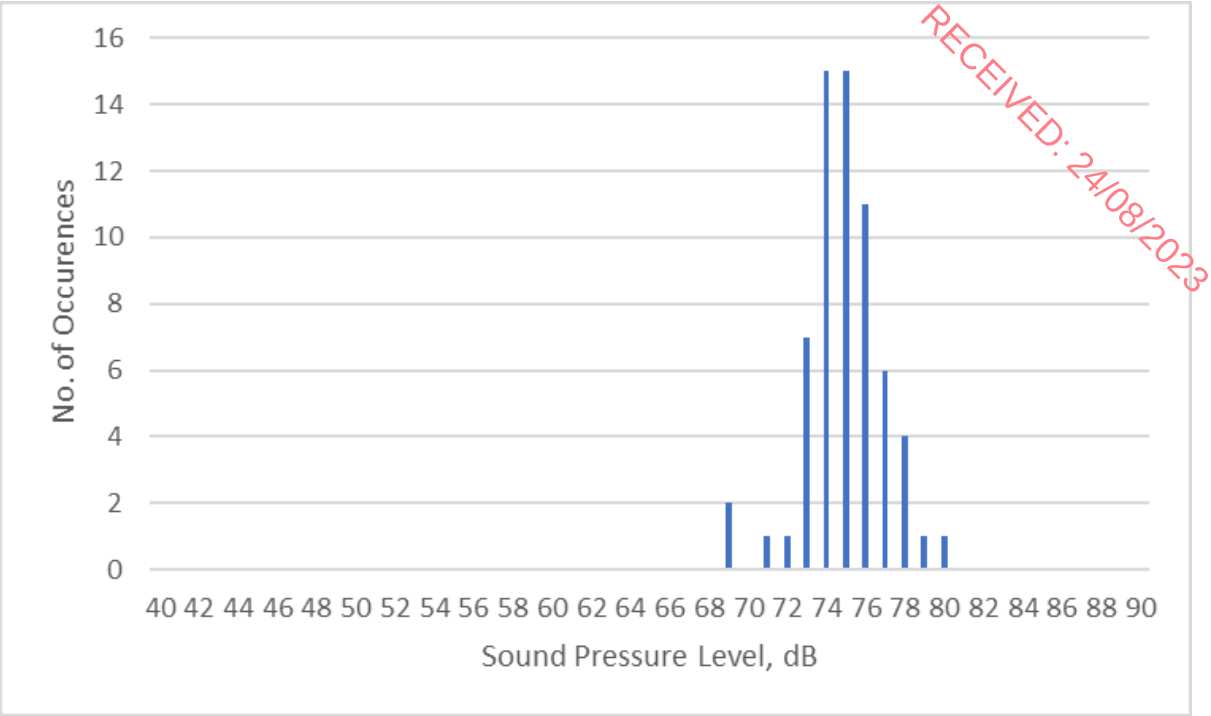

Figure 9.5 Number of $L_{Amax,\ 15\ min}$ events at each decibel level – Night-time period

9.6.1.8 Additional Noise Survey at Ashe Road

An additional daytime noise survey was carried out on 19 July 2023 by AWN for the purposes of quantifying the noise level along Ashe Road and also to ascertain whether the electrical substation could be an intrusive potential noise source for the proposed development. The measurements were taken with a Rion NL-52 what was calibrated on 2 September 2022.

Noise measurements were carried out at four locations as shown in Figure 9.6. The measured noise levels are presented in Table 9.10. Measurements were of 15 minutes' duration at L1 and of 10 minutes duration at L2, L3 and L4.

Table 9.10 Summary of Measurement Results for Additional Noise Survey

Location	Time	Measured Noise Levels (dB re. $2x10^{-5}$ Pa)			
		L_{Aeq}	L_{Amax}	L_{A10}	L_{A90}
L1	14:50	69	84	45	49
	15:54	70	85	49	53
	16:10	70	83	47	51
L2	15:09	58	69	44	50
L3	15:21	57	70	51	54
L4	15:41	58	73	47	51

The dominant noise source was road traffic along Ashe Rd, with the construction activities at the Rathgowan Phase 3 site becoming audible during occasional lulls in road traffic noise.

Close inspection of the substation showed that there was no audible source of noise within the substation compound.

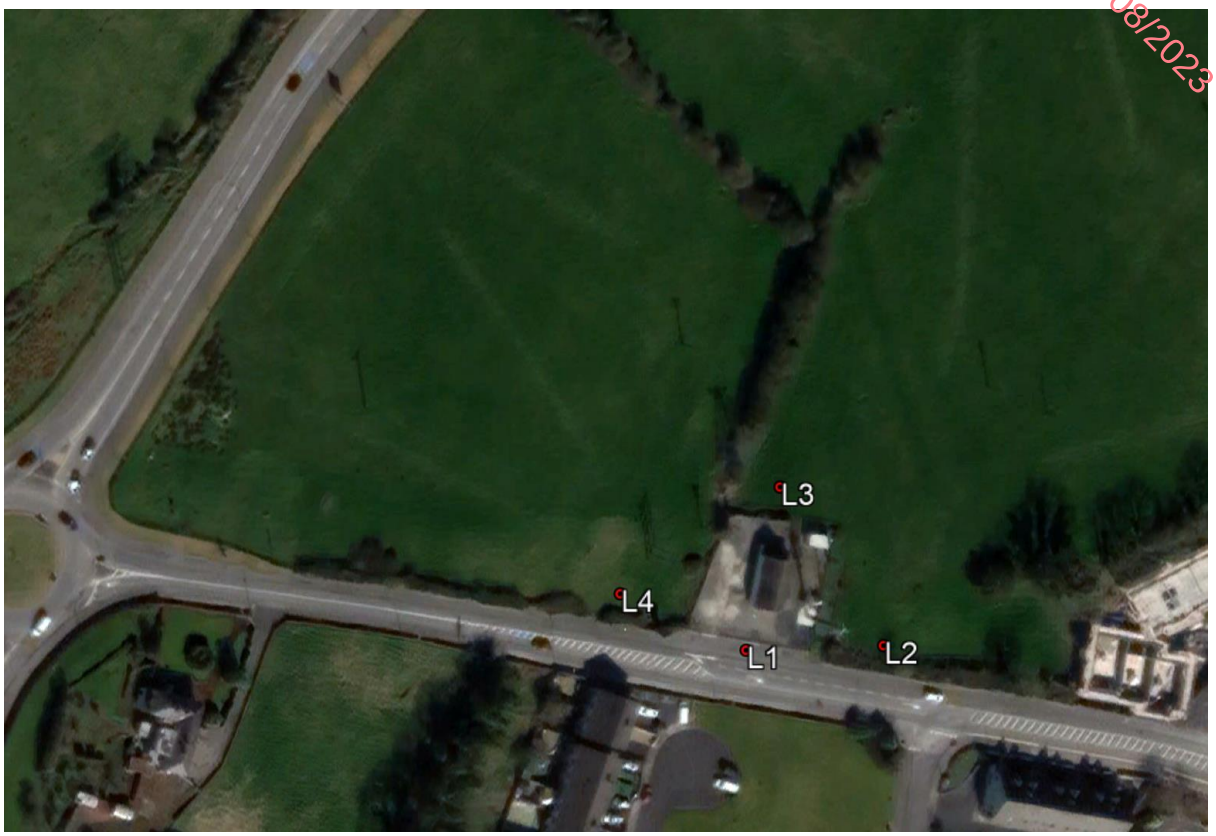

Figure 9.6 Additional Noise Measurement Locations at Mullingar Substation

9.6.2 Road Noise Model

In addition to the noise survey discussed in the previous section, proprietary noise calculation software has been used for the purposes of this impact assessment to calculate road traffic noise levels at various facades across the development site. The selected software, Envirosuite Predictor, calculates noise levels in accordance with the UK's Calculation of Road Traffic Noise (CRTN 1988) which is the recommended procedure for Irish National routes as per Transport Infrastructure Ireland's (TII) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004).

The resultant noise level is calculated taking into account a range of factors affecting the propagation of sound, including:

- The magnitude of the noise source in traffic flow and average velocity;
- The distance between the source and receiver;
- The presence of obstacles such as screens or barriers in the propagation path;
- The presence of reflecting surfaces; and,
- The hardness of the ground between the source and receiver.

In order to determine the noise levels at the various façades of the proposed development, the following information was included in the model:

- Site layout drawings of proposed development, and;
- OS mapping of surrounding environment.

The results of the noise survey were used to calibrate the noise model. In this instance the noise model results are within 1dB of the measured values indicating good agreement between the model and the measurements. Figure 9.7 shows a 3D view of the noise developed model.

Predicted noise levels for day and night periods over the site, in the absence of the proposed development, are presented in Figure 9.8 and **Figure 9.9**. These are used to evaluate the Noise Risk at the site.

Figure 9.7 3D Noise model of site

Figure 9.8 Daytime noise contours in dB(A) over existing site – in the absence of the development

Figure 9.9 Night-time noise contours in dB(A) over existing site – in the absence of the development

Figure 9.10 and Figure 9.11 show the predicted noise level contours over the site with the proposed development in place. Daytime noise levels range from 60 to 65 dB $L_{Aeq,16hrs}$ at the eastern edge of the site, to below 50 $L_{Aeq,16hrs}$ at the western part of the site.

Similarly, night noise levels range from 55 to 60 dB $L_{Aeq,8hrs}$ at the western edge of the site, to below 40 dB $L_{Aeq,8hrs}$ at the eastern part of the site.

Figure 9.10 Daytime Predicted Noise Contours

Figure 9.11 Night-time Predicted Noise Contours

9.6.3 Future Noise Environment

It is important to note that the noise model is based on the measured noise levels and is representative of current traffic volumes. It is acknowledged that an increase in road traffic volumes would give rise to a corresponding increase in noise levels. With road traffic noise, typically a 25% increase in volumes would be expected to give rise to a 1 dB increase in noise levels.

In order to present a worst-case scenario, all predicted façade noise levels and mitigation measures will include a 2 dB increase to account for future traffic growth.

9.6.4 Summary of Assumed Façade Noise Levels on Developed Site

Based on a review of the survey data, the following noise levels are assumed to be incident on the various façades of the development:

Table 9.11 Assumed Façade Noise Levels on Development Site

Period	Assumed Noise Level, dB(A)	
	Facades along R394	Facades along Ashe Road
Daytime $L_{Aeq,16hrs}$	65	67
Night-time $L_{Aeq,8hrs}$	55	60
Night-time L_{Amax}	78	78

9.6.5 Noise Risk Assessment Conclusion

Giving consideration to the noise levels presented in the previous sections, the initial site noise risk assessment has concluded that the level of risk across the site is Negligible to Low Risk across much of the site, to Medium Risk along the eastern edge. ProPG states the following with respect to various levels of risk:

> *Negligible RiskThese noise levels indicate that the development site is likely to be acceptable from a noise perspective, and the application need not normally be delayed on noise grounds.*
>
> *Low Risk At low noise levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.*
>
> *Medium Risk As noise levels increase, the site is likely to be less suitable from a noise perspective and any subsequent application may be refused unless a good acoustic design process is followed and is demonstrated in an ADS which confirms how the adverse impacts of noise will be mitigated and minimised, and which clearly demonstrate that a significant adverse noise impact will be avoided in the finished development.*

Given the above it can be concluded that part of the development site may be categorised as having 'Medium' risk, an Acoustic Design Strategy will be required to demonstrate that suitable care and

attention has been applied in mitigating and minimising noise impact to such an extent that an adverse noise impact will be avoided in the final development.

It should be noted that ProPG states the following with regard to how the initial site noise risk is to be used:

> *"2.12 It is important that the assessment of noise risk at a proposed residential development site is not the basis for the eventual recommendation to the decision maker. The recommended approach is intended to give the developer, the noise practitioner, and the decision maker an early indication of the likely initial suitability of the site for new residential development from a noise perspective and the extent of the acoustic issues that would be faced. Thus, a site considered to be high risk will be recognised as presenting more acoustic challenges than a site considered as risk. A site considered as negligible risk is likely to be acceptable from a noise perspective and need not normally be delayed on noise grounds. A potentially problematical site will be flagged at the earliest possible stage, with an increasing risk indicating the increasing importance of good acoustic design."*

Therefore, following the guidance contained in ProPG does not preclude residential development on sites that are identified as having medium risk noise levels. It merely identifies the fact that a more considered approach will be required to ensure that developments on the higher risk sites are suitable designed to mitigate the noise levels. The primary goal of the approach outlined in ProPG is to ensure that the best possible acoustic outcome is achieved for a particular site.

9.7 The 'Do nothing' Scenario

In the absence of the proposed development being constructed, the noise environment at the nearest noise sensitive locations and within the development site will remain largely unchanged resulting in a neutral and local impact in the long-term. However, there is a housing development on the west side of the R394 (Westmeath County Council File reference 22/515) which is not yet constructed, the impact of which is assessed in the EIAR submitted with that application.

9.8 Potential Significant Effects

9.8.1 Construction Phase

As the construction programme has been established in outline form, construction noise associated with activities on site during this 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.

For site clearance, building construction works, road works and landscaping works (excavators, loaders, dozers, concreting works, mobile cranes, generator), 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 power value of 113 dB L_{WA} 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. This is a highly conservative value as it assumes all items of plant are operating simultaneously along the closest boundary.

Given the nature of the proposed works which will include standard house and apartment building techniques across the site, a cumulative construction noise level of 85 dB L_{Aeq} at 10m represents a conservative noise level used to assess construction activities associated with the earlier stages of construction when, excavation, foundation and piling works will be employed. 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 noise-sensitive location (NSL) .

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 power value of 106 dB L_{WA} 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.

For the purposes of the calculation, the closest noise sensitive location to construction works are the houses to the east of the site, the nearest of which is at a distance of approximately 10 m from a development building. The next nearest noise-sensitive locations are the houses to the south and north at a distance of approximately 20 m from the nearest development building.

Table 9.12 Potential construction noise levels at varying distances

Description of noise source	Sound Pressure Level at 10 m	Calculated noise levels at varying distances (dB $L_{Aeq,T}$)				
		20 m	50 m	75 m	100 m	150 m
Site clearance, excavation, foundations, internal roads and landscaping	85	77	69	65	63	59
General Construction	78	70	62	58	56	52

The calculated noise levels in Table 9.12 show that at the closest residential NSLs to the works, which are at distances of the order of 10 to 20 m from the nearest building, the predicted noise levels are in excess of the adopted criteria of 65 dB $L_{Aeq,1hr}$, leading to a significant impact while construction activity is close to the noise-sensitive location. Mitigation measures in respect of these locations, including a solid site hoarding offering a reduction in noise levels of 10dBm, are discussed in Section 9.10.1.

However, once the construction activity moves to other areas of the site, the noise levels will reduce. For the majority of the construction period at the majority of noise-sensitive locations, the construction noise levels are within the adopted criteria of 65 dB $L_{Aeq,1hr}$.

The construction noise effects are before mitigation is applied therefore at the closest locations, negative, significant and short-term.

Table 9.13 Description of impacts for Construction Noise

Quality	Negative
Significance	Significant at distances less 75m or less, otherwise Moderate
Extent	Local
Probability	Likely
Duration	Short-term

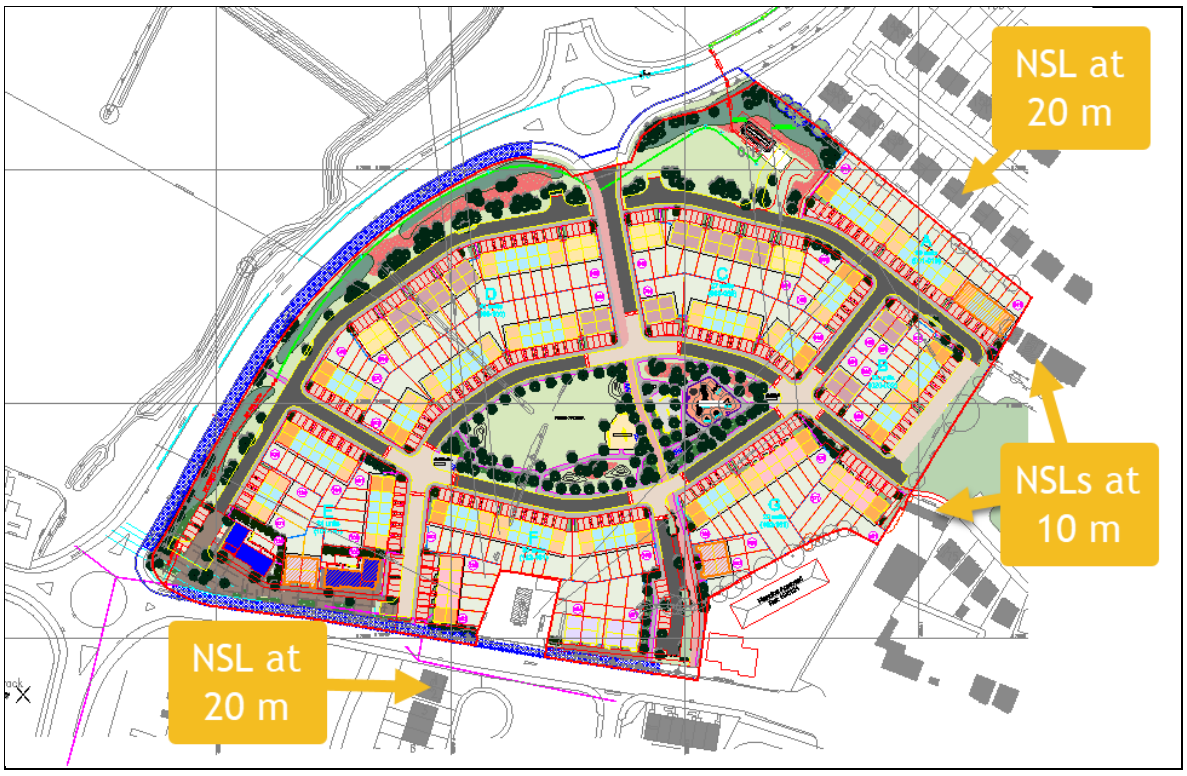

Figure 9.12 Map showing Noise Sensitive Locations

9.8.1.1 Construction Vibration

In terms of construction vibration, it is anticipated that excavations will be made using standard excavation machinery, which typically do not generate appreciable levels of vibration close to the source. Taking this into account and considering the distance that these properties are from the works and the attenuation of vibration levels over distance, the resultant vibration levels are expected to be

well below a level that would cause disturbance to building occupants or even be perceptible. The associated impact is considered neutral, imperceptible and short-term.

Table 9.14 Description of impacts for Construction Vibration

Quality	Negative
Significance	Not Significant
Extent	Local
Probability	Likely
Duration	Short-term

9.8.1.2 Construction Traffic

In terms of the additional traffic on local roads that will be generated as a result of construction of this development the following comment is presented: Considering that in order to increase traffic noise levels by 1dB 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 of this development will not result in a significant noise impact. With reference to Table 9.3, the resultant noise impact is negative, not significant and short-term.

Table 9.15 Description of impacts for Construction Traffic

Quality	Negative
Significance	Not Significant
Extent	Local
Probability	Likely
Duration	Short-term

9.8.2 Operational Phase

9.8.2.1 Additional Vehicular Traffic on Surrounding Roads

During the operational phase of the proposed development, there will be a small increase in vehicular traffic on surrounding roads associated with the site and other planned developments. Details of the traffic assessment are included in Chapter 12 of this EIAR.

For the purposes of assessing potential noise impact, it is appropriate to consider the relative increase in noise level associated with traffic movements on existing roads surrounding the subject site with and without development. Using the information on daily traffic flows in terms of AADT (annual average daily traffic) presented in Chapter 12, the impact from the increase in traffic from the proposed development has been assessed for the year of 2025 and the year of 2040 relative to the Do nothing scenario along the sections of road detailed in Table 9.16.

Table 9.17 repeats the analysis though it assumes that the development planning ref 22/515 is not constructed, therefore the change in traffic flow and traffic noise is greater.

Table 9.16 Predicted Change In Noise Level associated with Vehicular Traffic – Assuming 22/515 is constructed

Road Link	2025		2040	
	Increase in traffic flow	Increase in noise level, dB	Increase in traffic flow	Increase in noise level, dB
Jct 1: A – R394 (North)	2%	0.1	1%	0.1
Jct 1: B – Midland Hospital	1%	0.1	1%	0.0
Jct 1: C – R394 (South)	4%	0.2	3%	0.1
Jct 1: D – Unknown Local Road	1%	0.0	1%	0.0
Jct 2: A – R394 (North)	3%	0.1	3%	0.1
Jct 2: B – Phase 1&2	--	--	--	--
Jct 2: C – R394 (South)	3%	0.1	3%	0.1
Jct 2: D – Phase 3	--	0.0	--	0.0

Table 9.17 Predicted Change In Noise Level associated with Vehicular Traffic – Without 22/515

Road Link	2025		2040	
	Increase in traffic flow	Increase in noise level, dB	Increase in traffic flow	Increase in noise level, dB
Jct 1: A – R394 (North)	4%	0.2	3%	0.1
Jct 1: B – Midland Hospital	3%	0.1	3%	0.1
Jct 1: C – R394 (South)	10%	0.4	8%	0.3
Jct 1: D – Unknown Local Road	2%	0.1	2%	0.1
Jct 2: A – R394 (North)	9%	0.4	7%	0.3
Jct 2: B – Phase 1&2	--	--	--	--
Jct 2: C – R394 (South)	9%	0.4	7%	0.3
Jct 2: D – Phase 3	--	--	--	--

The changes in noise levels are all less that 1dB, therefore in accordance with Table 9.3, the associated effect is neutral to negative, imperceptible to not significant and long-term.

Table 9.18 Description of impacts for Additional Vehicular Traffic on Surrounding Roads

Quality	Neutral
Significance	Imperceptible
Extent	Local
Probability	Likely
Duration	Short-term

9.8.2.2 Building Services Plant

It is expected that the principal items of building and mechanical services plant will be for heating and ventilation of the buildings. These items and their location will be selected at the detailed design stage to ensure that noise emissions to sensitive receivers both external and within the development itself will be within the relevant criteria set out in Section 9.4.3.2. The effects are considered negative, not significant and long-term.

Table 9.19 Description of impacts for Building Services Plant

Quality	Negative
Significance	Not Significant
Extent	Local
Probability	Likely
Duration	Long-term

9.8.3 Cumulative Effects

There are three planning applications of scale: one located on the western side of the R394 road, by the same applicant, reference number 22/515, corresponds to phase 3 of the Rathgowan housing development. This development is currently being constructed.

Application references 21/97 and 21/139 represent earlier applications on the subject site. If the Proposed Development is permitted, then these developments will not be constructed.

9.8.3.1 Construction Phase

There is potential for cumulative construction impacts should the construction phases of the proposed development coincide with that of other developments.

However, as shown in

Figure **9.12**, considering the distances between the proposed and permitted developments, construction works for the permitted developments will be considerably further from these noise-sensitive locations than the that of the subject site, and hence the noise level due to construction at those sites will be commensurately lower.

For the closest noise-sensitive locations, i.e. those at distances of the order of 10 to 20 m from the works, the effects remain negative, significant, local and short-term.

For locations at greater distances greater, the effects remain negative, moderate, local and short-term.

9.8.3.2 Operational Phase

The key potential noise source associated with the proposed development relates to additional traffic on the surrounding road network. The cumulative noise impacts associated with existing, permitted and development-related traffic has been considered within this assessment and the effects are considered neutral to negative, imperceptible to not significant and long-term at all locations.

9.8.4 Summary

The Table below summarises the identified likely effects during the construction phase of the proposed development in the absence of mitigation.

Table 9.20 Summary of Construction Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction of dwellings	Negative	Significant at 20 to 20m distance, otherwise Moderate	Local	Likely	Short-term	Direct
Construction Traffic	Negative	Not Significant	Local	Likely	Short-term	Direct

The Table below summarises the identified likely effects during the operational phase of the proposed development in the absence of mitigation.

Table 9.21 Summary of Operational Phase Likely Significant Effects in the absence of mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Traffic	Neutral to negative	Imperceptible to Not Significant	Local	Likely	Long-term	Direct
Building Services Plant	Negative	Not Significant	Local	Likely	Long-term	Direct

9.9 Inward Impact

This section presents the findings of the ProPG Stage 2 Full Acoustic Assessment.

9.9.1 Element 1 – Good Acoustic Design Process

9.9.1.1 ProPG Guidance

In practice, good acoustic design should deliver the optimum acoustic design for a particular site without adversely affecting residential amenity or the quality of life of occupants or compromising other sustainable design objectives. It is important to note that ProPG specifically states that good acoustic design is not equivalent to overdesign or "gold plating" of all new development but that it seeks to deliver the optimum acoustic environment for a given site.

Section 2.23 of the ProPG outlines the following checklist for Good Acoustic Design:

- Check the feasibility of relocating, or reducing noise levels from relevant sources;

- Consider options for planning the site or building layout;
- Consider the orientation of proposed building(s);
- Select construction types and methods for meeting building performance requirements;
- Examine the effects of noise control measures on ventilation, fire regulation, health and safety, cost, CDM (construction, design and management) etc;
- Assess the viability of alternative solutions; and,
- Assess external amenity area noise.

In the context of the proposed development, each of the considerations listed above have been addressed in the following subsections.

9.9.1.2 Application of GAD Process to Proposed Application

9.9.1.2.1 Relocation or Reduction of Noise from Source

The main noise sources are located outside the redline boundary of the site and therefore it is beyond the scope of this development to introduce any noise mitigation at source.

9.9.1.2.2 Planning, Layout and Orientation

The layout of the site leaves a buffer of approximately 15 m in width between the development facades which are closest to the R394 road and a small buffer of the order of 10m onto the Ashe Road. Also, the open amenity areas within the site are located further back from the road and the noise level in these areas benefits from the acoustic screening offered by the buildings themselves.

9.9.1.2.3 Select Construction Types for meeting Building Regulations

Masonry constructions will be used in constructing the external walls of the development. This construction type offers high levels of sound insulation performance. However, as is typically the case the glazed elements and any required ventilation paths to achieve compliance with Part F of the Building Regulations will be the weakest elements in the façade in terms of sound insulation performance.

Consideration will therefore be given to the provision of upgraded glazing and acoustic vents where required. For units where it will not be possible to achieve the desirable internal acoustic environments with windows open, the proposal here will be to provide dwelling units with glazed elements and ventilators that have good acoustic insulation properties so that when the windows are closed the noise levels internally are good. Inhabitants will be able to open the windows if they wish, however, doing so will increase the internal noise level. This approach to mitigation is supported in ProPG where it states the following (note emphasis has been added in bold),

> *"2.22 Using fixed unopenable glazing for sound insulation purposes is generally unsatisfactory and should be avoided;* ***occupants generally prefer the ability to have control over the internal environment using openable windows, even if the acoustic conditions would be considered unsatisfactory when open****. Solely relying on sound insulation of the building envelope to achieve acceptable acoustic conditions in new residential development, when other methods could reduce the need for this approach, is not regarded as good acoustic design. Any reliance upon building*

envelope insulation with closed windows should be justified in supporting documents "

Note 5 Designing the site layout and the dwellings so that the internal target levels can be achieved with open windows in as many properties as possible demonstrates good acoustic design. Where it is not possible to meet internal target levels with windows open, internal noise levels can be assessed with windows closed, however any façade openings used to provide whole dwelling ventilation (e.g. trickle ventilators) should be assessed in the "open" position and, in this scenario, the internal LAeq target levels should not normally be exceeded

2.34 *Where the LPA accepts that there is a justification that the internal target noise levels can only be practically achieved with windows closed, which may be the case in urban areas and at sites adjacent to transportation noise sources, special care must be taken to design the accommodation so that it provides good standards of acoustics, ventilation and thermal comfort without unduly compromising other aspects of the living environment. In such circumstances, internal noise levels can be assessed with windows closed but with any façade openings used to provide "whole dwelling ventilation" in accordance with Building Regulations Approved Document F (e.g. trickle ventilators) in the open position (see Supplementary Document 2). Furthermore, in this scenario the internal LAeq target noise levels should not generally be exceeded."*

It is very important to note that it is impractical to achieve the good internal noise levels with windows open across the vast majority of development sites in close proximity to major infrastructure such as roads or airports. Such sites would need to be classified as having a negligible risk in accordance with the ProPG noise risk assessment approach. For this reason, there are no guidance documents either at a local level or an international level that AWN is aware of which would support the approach of achieving the ideal internal noise levels only in the open window scenario. It is therefore considered entirely correct and justifiable to provide building facades with a moderate degree of sound insulation such that with windows closed but vents opened a good internal acoustic environment is achieved.

9.9.1.2.4 Impact of noise control measures on fire, health and safety etc

The good acoustic design measures that have been implemented on site, e.g. upgrading the glazing along certain façades are not considered to have effects on fire risk issues or health and safety.

9.9.1.2.5 Assess Viability of Alternative Solutions

The option of introducing additional noise screening along the boundary of the site was considered. In this instance, it was concluded that the benefits of measures of this type would be limited given the proposed buffer between the houses and the surrounding road network.

9.9.1.2.6 Assess External Amenity Area Noise

ProPG provides the following advice with regards to external noise levels for amenity areas in the development:

"The acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB LAeq,16hr."

The values are largely based on WHO guideline values. In Figure 9.10, it is shown that across the majority of the site, the individual gardens and open amenity space are predicted to have noise levels generally within this range.

Good acoustic design principles employed have ensured that there is open space available in the quietest part of the site, which will be available to all occupants of the proposed development.

9.9.1.2.7 Summary

Considering the constraints of the site, in so far as possible and without limiting the extent of the development area, the principles of Good Acoustic Design have been applied to the development.

In terms of viable alternatives to acoustic treatment of façade elements, currently it is not considered likely that there will be further options for mitigation outside of proprietary acoustic glazing and ventilation.

9.9.2 Element 2 – Internal Noise Guidelines

9.9.2.1 Internal Noise Criteria

Element 2 of the ProPG document sets out recommended internal noise targets derived from BS 8233 (2014). The recommended indoor ambient noise levels are set out in Table 9.22 and are based on annual average data, that is to say they omit occasional events where higher intermittent noisy events may occur, such as New Year's Eve.

Table 9.22 ProPG Internal Noise Levels

Activity	Location	(07:00 to 23:00hrs)	(23:00 to 07:00hrs)
Resting	Living room	35 dB $L_{Aeq,16hrs}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hrs}$	-
Sleeping	Bedroom	35 dB $L_{Aeq,16hrs}$	30 dB $L_{Aeq,8hrs}$ 45 dB $L_{Amax,T}$*

*Note The document comments that the internal $L_{AFmax,T}$ noise level may be exceeded no more than 10 times per night without a significant impact occurring.

In addition to these absolute internal noise levels ProPG provides guidance on flexibility of these internal noise level targets. For instance, in cases where the development is considered necessary or desirable, and noise levels exceed the external noise guidelines, then a relaxation of the internal L_{Aeq} values by up to 5 dB can still provide reasonable internal conditions.

9.9.2.2 Discussion on Open/Closed Windows

In the first instance, it is important to note the typical level of sound reduction offered by a partially open window falls in the region of 10 to 15 dB.

Considering the design goals outlined in Table 9.22, and a sound reduction across an open window of 15 dB, the free-field noise levels that would be required to ensure that internal noise levels do not exceed good (i.e. at or below the internal noise levels) or reasonable internal noise levels (i.e. 5 dB above the internal noise levels) have been summarised in Table 9.23.

Table 9.23 External Noise Levels Required to Achieve Internal Noise Levels

Level Desired	Day 07:00 to 23:00hrs	Night 23:00 to 07:00hrs
Good (i.e. at or below the internal noise levels)	50 – 55 dB $L_{Aeq,16hrs}$	45 dB $L_{Aeq,8hrs}$
Reasonable (i.e. 5 dB above the internal noise levels)	55 – 60dB $L_{Aeq,16hrs}$	50 dB $L_{Aeq,8hrs}$

For the buildings closest to the eastern boundary of the site the external noise levels are such that there are façades where it will not be possible to achieve the desired good internal noise levels with windows open, therefore appropriate acoustic specifications to windows and passive vents will be provided to ensure the rooms are adequately ventilated and achieve the good internal noise levels detailed here.

However, for the buildings in the central and western parts of the site, the noise levels are such the good acoustic conditions are possible with windows open.

9.9.2.3 Proposed Façade Treatment

The British Standard BS EN 12354-3: 2000: Building acoustics – Estimation of acoustic performance of buildings from the performance of elements – Part 3: Airborne sound insulation against outdoor sound provides a calculation methodology for determining the sound insulation performance of the external envelope of a building. The method is based on an elemental analysis of the building envelope and can take into account both the direct and flanking transmission paths.

The Standard allows the acoustic performance of the building to be assessed taking into account the following:

- Construction type of each element (i.e. windows, walls, etc.);
- Area of each element;
- Shape of the façade, and;
- Characteristics of the receiving room.

The principles outlined in BS EN 12354-3 are also referred to in BS8233 and Annex G of BS8233 provides a calculation method to determine the internal noise level within a building using the composite sound insulation performance calculated using the methods outlined in BS EN 12354-3. The methodology outlined in Annex G of BS8233 has been adopted here to determine the required performance of the building facades.

9.9.2.4 Glazing

As is the case in most buildings, the glazed elements of the building envelope are typically the weakest element from a sound insulation perspective. In this instance the facades along the first line of buildings as shown in Figure 9.13 will be provided with glazing that, when closed, achieve the indicative minimum sound insulation performance as set out in Table 9.24. See Figure 9.13 for the extent of glazing requirements in red and green zones.

Table 9.24 Sound Insulation Performance Requirements for Glazing, SRI (dB)

Façades	Octave Band Centre Frequency (Hz)						R_w
	125	250	500	1k	2k	4k	
Along Ashe Road (**Red**)	24	25	31	41	43	44	37
Along R394 (Green)	24	25	32	34	36	38	34

Acoustic specifications such as that presented in Table 9.24 can be achieved using double-glazed units with slightly thicker than standard glass. This performance could also be achieved using a suitably specified triple glazing window.

In the context of the acoustic performance specification the 'glazing system' is understood to include any and all of the component parts that form part of the glazing element of the façade, i.e. glass, frames, seals, openable elements etc.

The overall R_w outlined above are provided for information purposes only. The over-riding requirement is that the internal noise criteria is achieved, other combinations of upgraded glazing and ventilation (see below) may provide the same or better performance than those outlined here.

Figure 9.13 Site Plan with Areas for Acoustic Treatment in Red and Green

9.9.2.5 Wall Construction

In general, all wall constructions (i.e. block work or concrete) offer a high degree of sound insulation, much greater than that offered by the glazing systems. Therefore, noise intrusion via the wall construction will be minimal. The calculated internal noise levels across the building façade have assumed a minimum sound reduction index of 50 dB R_w for this construction.

9.9.2.6 Ventilation

The ventilation strategy for the development will be in accordance with Part F of the Building Regulations and will be finalised at the detail design stage. Options which will be considered to achieve compliance with background ventilation requirements will be adjustable hit and miss acoustic ventilators or trickle vents built into the façade or window frames respectively. It is recommended that the wall vents in the facades marked in red in Figure 9.13 are specified to achieve a sound insulation performance as set out in Table 9.25. This specification can be achieved by a range of proprietary vents in either through frame trickle vent or through wall vents.

Table 9.25 Sound Insulation Performance Requirements for Vents, SRI (dB)

Octave Band Centre Frequency (Hz)						$D_{ne,w}$
125	250	500	1k	2k	4k	
41	36	44	45	59	65	44

Similarly, the overall $D_{ne,w}$ outlined above are provided for information purposes only. The over-riding requirement is that the internal noise criteria is achieved, other combinations of upgraded glazing and ventilation may provide the same or better performance than those outlined here.

9.9.2.7 Roofs

There is the potential for the roof structure to allow the passage of sound into the rooms. In order to control potential sound transmission via this route the ceiling / roof construction will need to provide a sound reduction in excess of that required for the windows.

For the proposed houses with pitched tiled roofs, a suitable sound reduction performance would be provided by a standard tiled or slated roof with a single 12.5mm layer plasterboard ceiling and heat insulation layer above the ceiling.

Any penetrations through the ceiling constructions must be as small as possible and made good by fully filling with plaster or with an acoustic sealant.

9.9.2.8 Internal Noise Levels

Taking into account the external façade levels and the specified building envelope the internal noise levels have been calculated. In all instances the good internal noise criteria are achieved for daytime and night-time periods.

9.9.2.9 Element 3 – External Amenity Area Noise Assessment

As previously discussed, Figure 9.10 illustrates that the inhabitants will have access to an outdoor amenity area at the especially in the north-eastern area of the site, which achieves a noise level ≤55dB $L_{Aeq,16hr}$ which is recommended in ProPG.

9.9.2.10 Element 4 – Assessment of Other Relevant Issues

Element 4 gives consideration to other factors that may prove pertinent to the assessment, these are defined in the document as:

- 4(i) compliance with relevant national and local policy
- 4(ii) magnitude and extent of compliance with ProPG
- 4(iii) likely occupants of the development
- 4(iv) acoustic design v unintended adverse consequences
- 4(v) acoustic design v wider planning objectives

Each is discussed in turn below.

9.9.2.10.1 Compliance with Relevant National and Local Policy

There are no National policy documents relating to the acoustic design of residential dwellings. Locally the Westmeath Noise Action Plan specifies that "*Local sources of noise pollution must be taken into account when planning and designing new residences*". This Acoustic Design Statement has been prepared in compliance with the requirements of ProPG and therefore complies with the requirements of local policy.

9.9.2.10.2 Magnitude and Extent of Compliance with ProPG

As discussed within this report the following conclusions have been drawn with regards to the extent of compliance with ProPG:

- All dwellings as part of the development have been designed to achieve the good level of internal noise levels specified within ProPG with windows closed but with the mechanical ventilation systems providing suitable levels of ventilation, and;
- All external amenity areas have been shown to have an external noise level that complies with the recommended criterion set out in ProPG.

Based on the preceding it is concluded that the proposed development is in full compliance with the requirements of ProPG.

9.9.2.10.3 Likely Occupants of the Development

The criteria adopted as part of this assessment are based on those recommended for permanent dwellings and are therefore considered robust and appropriate for the likely occupants.

9.9.2.10.4 Acoustic Design v Unintended Adverse Consequences

Unintended adverse consequences did not occur on this project.

9.9.2.10.5 Acoustic Design v Wider Planning Objectives

With reference to the Westmeath Noise Action Plan (NAP) 2018-2023, this assessment has demonstrated the noise insulation measures required to ensure that the proposed dwelling units achieve a good internal noise environment.

9.10 Mitigation

9.10.1 Construction Phase Mitigation

In this instance the assessment within this document has found that construction noise is expected to be below the level where a significant impact is likely to occur. Notwithstanding this, the contractor will be required to ensure that all best practice noise and vibration control methods will be used to minimise noise and vibration levels.

With regard to construction activities, best practice operational and control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) *Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2.*

BS5228 includes guidance on several aspects of construction site practices, including, but not limited to:

- selection of quiet plant;
- control of noise sources;
- screening (boundary, and or localised plant screening);
- hours of work;
- liaison with the public, and;
- monitoring.

Detailed 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, limiting the hours of work and noise monitoring.

9.10.1.1 Selection of Quiet Plant

This practice is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. To facilitate this, each item of plant equipment will be required to comply with the EC Directive on Outdoor Noise Emissions 2000/14/EC. The least noisy item will be selected wherever possible.

9.10.1.2 Noise Control at Source

If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact.

BS5228 states that "as far as reasonably practicable sources of significant noise should be enclosed". In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators.

BS5228 makes a number of recommendations in relation to "use and siting of equipment". These are all directly relevant and hence are reproduced below. These recommendations will be adopted on site.

> *"Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas.*
>
> *Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy.*
>
> *Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels.*
>
> *Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended.*
>
> *Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material."*

Other forms of noise control at source relevant to the development works are set out below:

- For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. 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 muffler or sound reducing equipment to the breaker 'tool' and ensure any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries.
- For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum.
- For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials.
- Demountable enclosures can also be used to screen operatives using hand tools/ breakers and will be moved around site as necessary.
- All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures.

9.10.1.3 Screening

Typically screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver. Screening may be a useful form of noise control when works are taking place at basement and ground level to screen noise levels at ground floor adjacent buildings.

In addition, careful planning of the site layout will also be considered. The use of localised mobile (mobile hoarding screens and / or acoustic quilts) to items of plant with the potential to generate high levels of noise are an effective noise control measure. These options will be considered when percussive works are taking place in close proximity to the nearest sensitive perimeter buildings.

In particular, screening offering a reduction in noise levels of 10 dB will be required along the boundaries with the Ashfield housing area.

9.10.1.4 Liaison with the Public

A designated noise liaison will be appointed to site during construction works. All noise complaints will be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to particularly noisy construction activity, the liaison officer will inform residents at the nearest noise sensitive locations of the time and expected duration of the noisy works.

9.10.1.5 Hours of Work

Construction works will be undertaken within the times below, taken from the Construction Environmental Management Plan:

- Monday to Friday 07:00 to 18:00hrs
- Saturday 08:00 to 14:00hrs
- Sunday and Public Holidays No work on site.

However, it may be necessary for some construction operations to be undertaken outside these times, for example; connections to public service systems or utilities. Such works will be agreed in advance with Westmeath County Council.

In order to ensure that acceptable operational noise levels at the nearest noise sensitive locations are achieved, the following mitigation measures will be considered during the detailed design stage.

9.10.2 Operational Phase Mitigation

9.10.2.1 Additional Vehicular Traffic on Surrounding Roads

During the operational phase of the development, noise mitigation measures with respect to the impact of traffic from the development are not deemed necessary.

9.10.2.2 Building Services Plant

With consideration at the detailed design stage the selection and location of plant items will ensure that noise emissions to sensitive receivers both external and within the development itself will be within the relevant criteria, therefore no further mitigation is required.

Considering that sensitive receivers within the development are much closer than off-site sensitive receivers, once the relevant noise criteria is achieved within the development it is expected that there will be no negative impact at sensitive receivers off site.

9.10.2.3 Inward Impact

At detailed design stage, glazing and vent specifications such as the indicative values presented in sections 9.9.2.4 and 9.9.2.6 respectively will ensure suitable internal noise levels.

9.10.3 Cumulative Mitigation

9.10.3.1 Construction Phase

No noise mitigation measures are required.

Nonetheless it is recommended that liaison between construction sites is on-going throughout the duration of the construction phase. Contractors should schedule work in a co-operative effort to limit the duration and magnitude of potential cumulative impacts on nearby sensitive receptors.

9.10.3.2 Operational Phase

Not required.

9.11 Residual Impact Assessment

This section describes the degree of environmental change that will occur after the proposed mitigation measures have taken effect.

9.11.1 Construction Phase

During the construction phase of the project there is the potential for short-term noise effects on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable.

Likely noise and vibration effects during the construction phase will be local, negative, short-term and moderate.

9.11.2 Operational Phase

9.11.2.1 Additional Vehicular Traffic on Surrounding Roads

The predicted change noise levels associated with additional traffic is predicted to be of imperceptible impact along the existing road network. In the context of the existing noise environment, the overall effects from noise contribution of increased traffic is considered to be of neutral, imperceptible and long-term effect to nearby noise sensitive locations

9.11.2.2 Building Services Plant

Noise levels associated with operational plant are expected to be well within the adopted day and night-time noise limits at the nearest noise sensitive properties taking into account the site layout, the nature and type of units proposed and distances to nearest residences. Assuming the operational noise levels do not exceed the adopted design goals, the resultant residual noise effects from this source will be of negative, not significant, long-term impact.

9.11.3 Cumulative Impact

The cumulative noise impacts associated with existing and development related traffic, along with the developments mentioned in Section 9.8.3 has been considered within this assessment and the effects are considered neutral, imperceptible and long-term at all locations.

9.11.4 Summary

Table 9.26 summarises the identified likely significant effects during the construction phase of the proposed development following the application of mitigation measures.

Table 9.26 Summary of Construction Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Construction	Negative	Significant up to 20m distance, otherwise Moderate	Local	Likely	Short-term	Direct
Construction Vibration	Negative	Not Significant	Local	Likely	Short-term	Direct
Construction Traffic	Negative	Not Significant	Local	Likely	Short-term	Direct

The Table below summarises the identified likely significant effects during the operational phase of the proposed development post mitigation.

Table 9.27 Summary of Operational Phase Effects Post Mitigation

Likely Significant Effect	Quality	Significance	Extent	Probability	Duration	Type
Building Services	Negative	Not Significant	Local	Likely	Long-Term	Direct
Traffic	Neutral to Negative	Imperceptible to Not Significant	Local	Likely	Long-term	Direct

9.12 Risk of Major Accidents or Disasters

Not applicable.

9.13 Significant Interactions

The noise assessment interacts with the traffic assessment - the additional traffic on roads surrounding the development has been taken into account in the assessment. The associated effect is neutral to negative, imperceptible to not significant and long-term.

9.14 References & Sources

- EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports, (2022);
- British Standard Institute (BSI) BS 5228-1:2009 +A1:2014 Code of Practice for noise and vibration control of construction and open sites - Part 1: Noise (BSI, 2014);
- British Standard Institute (BSI) BS 5228-2:2009+A:2014 Code of Practice for noise and vibration control of construction and open sites - Part 2: Vibration (BSI, 2014);
- British Standard Institute (BSI) BS 7385: 1993 Evaluation and measurement for vibration in buildings Part 2: Guide to damage levels from ground borne vibration (BSI, 1993);
- UK Department of Transport (UK DOT) Calculation of Road Traffic Noise (UK DOT, 1988);
- United Kingdom Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) Sustainability & Environment Appraisal LA 111 Noise and Vibration Revision 2 (UKHA, 2020);
- British Standard Institute (BSI) BS 4142: 2014+A1:2019: Methods for Rating and Assessing Industrial and Commercial Sound;
- International Organization for Standardization (ISO) ISO 1996: 2017: Acoustics – Description, measurement, and assessment of environmental noise (ISO, 2017).
- World Health Organisation Environmental Noise Guidelines for the European Region, 2018
- Professional Practice Guidance on Planning & Noise (ProPG) Association of Noise Consultants (ANC), the Institute of Acoustics (IOA) and the Chartered Institute of Environmental Health (CIEH) (2017)
- Westmeath County Council Noise Action Plan 2018-2023
- Transport Infrastructure Ireland Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2014)

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 10

Landscape & Visual Impact

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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10 Landscape and Visual Impact Assessment

10.1 Introduction

This section of the EIAR appraises the existing landscape of the site at Rathgowan, Mullingar, Co. Westmeath and the greater context within which it lies. It will then assess the likely landscape and visual impacts arising from the proposed development on these lands. The assessment will also take into account the cumulative impact from nearby recent development and unbuilt permitted development. It will also describe the proposed landscape mitigation measures and the resulting residual landscape and visual impacts.

10.1.1 Author Information and Competency

JBA Consulting Engineers and Scientists Ltd has been commissioned to conduct a Landscape and Visual Impact Assessment (LVIA) of the site and environs. The chapter has been prepared by Christos Papachristou (Chartered Senior Landscape Architect), Conor O'Neill (Project Environmental Scientist), and Jemima Kivikoski (Assistant Environmental Scientist).

Christos is a Chartered Member of the Landscape Institute (CMLI) in the UK. Christos has carried out LVIAs and been involved in the preparation of numerous EIARs. Conor holds an MSc in Environmental Science and an Adv. Dip. in Planning and Environmental Law from the King's Inns, and has prepared LVIAs as part of wider EIARs for several housing developments. Jemima holds a BSc in Chemistry and a Pg. Dip. in Environmental Science, and has assisted in preparing LVIAs for a number of developments.

10.1.2 Reference to Guidelines Relevant to Discipline

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 (EC)
- Guidance on Integrating Climate Change and Biodiversity into Environmental Impact Assessment (2013); EC
- Guidelines on Landscape and Landscape Assessment (2000); Department of the Environment, Community and Local Government (DOE)
- National Landscape Strategy 2015-2025; DOE
- National Biodiversity Action Plan (2017-2021)
- Westmeath County Development Plan 2021-2027 (County DP); Westmeath County Council

- Mullingar Local Area Plan 2014-2020 (MLAP); Westmeath County Council
- LCA and LVIA of Specified Infrastructure Projects – Overarching Technical Document (Dec 2020); Transport Infrastructure Ireland (TII)
- Visual Representation of Development Proposals, Landscape Institute (UK, 2019); Technical guidance notes for photomontages
- Amenity Trees and Woodland: A Guide to their Management in Ireland (2010); Tree Council of Ireland

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. In a modern context, aerial images from 1995 to the present also informed landscape changes.

10.1.3 Methodology

The landscape and visual amenity assessment 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 landscape character areas from the permanent physical changes to the site brought about by the development.

The Landscape and Visual Impact Assessment in the EIAR and takes into consideration aerial photography, emerging design drawings, relevant various 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
- Landscape Character Assessment (LCA) of Westmeath County, Chapter 13 of the Westmeath County Development Plan 2021-2027.

Verified photomontages in accordance with the GLVIA guidance are included to facilitate the assessment of visual impacts. The mitigation measures for the protected structures have been agreed following liaison with the Conservation Officer.

10.1.3.1 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.

10.1.3.2 Sensitivity of the Landscape

The sensitivity of the landscape to change is the degree to which a particular Landscape Character Area (LCA) can accommodate changes or new elements without unacceptable detrimental effects to its 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
- Negligible - 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.

10.1.3.3 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.
- Negligible - Changes affecting small or very restricted areas of landscape character. This may include the limited loss of some elements or the addition of some new features or elements that are characteristic of the existing landscape or are hardly perceivable.
- 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.

10.1.3.4 Significance of Landscaped 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 summarised in Table 10.1 below.

Table 10.1 Significance of Landscape and Visual effects based on Magnitude and Sensitivity

	SENSITIVITY				
MAGNITUDE	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

10.1.3.5 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
- Negligible - Changes affecting restricted viewpoints.

10.1.3.6 Magnitude of Visual Impact

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
- Negligible - The proposal would be barely discernible within the available vista and/or it would not detract from, and may even enhance, the visual amenity of the scene.
- 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.

10.1.3.7 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 impacts, see Table 10.1.

10.1.3.8 Impact Classification Terminology

Table 10.2 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 10.2 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.

IMPACT CHARACTERISTICS	TERM	DESCRIPTION
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)
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.

10.1.3.9 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.

The area in which the proposals site is located contains other housing developments and therefore there is potential for cumulative effects on landscape and visual amenity.

10.1.4 Definition of the study area

In order to define the study area of the assessment the primary consideration is the Zone of Theoretical Visibility. This is the area from which it is expected that the proposed development will be visible based on a bare earth scenario. A bare earth scenario does not take into consideration elements that screen views like existing built environment and vegetation. A proportionate approach is taken based on the sensitivity of the landscape, the extents and nature of the proposal.

For developments of similar nature, an area covering 3km radius around the proposals is generally accepted as a proportionate approach.

10.1.5 Difficulties Encountered in Compiling Information

The Famine cemetery located northeast of the site at the southwestern edge of an industrial park was not accessible. Sherwood Park residential estate lies to the southeast of the cemetery and shares similar views. This estate was used to assess views instead of the cemetery. No views to the proposed development are expected.

A high point north of the N4 could not be accessed as it is located within private forestry lands. Fishing ponds which are part of Lough Drin to the south were accessible. The expected impact would be imperceptible.

10.2 Description of Existing Environment

10.2.1 Receiving Environment – Site Context

The proposed development is located at the northwest fringe of Mullingar town just within the town boundary. It lies outside the town centre, but has established links back to the historic core. On a broader scale, the site falls under the Landscape Character type "Central Hills and Lakes (Zone 4)" (County DP). The surrounding terrain (within 1km) would be considered gently undulating, with only modest changes in elevation. Gentle terrain typically limits degree of visibility. Taller hills arise north and west of the site approaching the rural environs around the lakes. Lough Owel lies approximately 3 km northwest and Lough Ennell lies approximately 4 km southwest of the site.

The site is accessed along its northern boundary from the R394, which serves as the spine between the Permitted Phase 3 site and proposed Phase 1/2 site. The R394 is a new relief road, providing peripheral access to the N4 and R390 to Athlone. Consequently, the site is strongly associated with the R394. A wayleave at the southwest corner links the site to the R393 (Longford Road). The R393 continues toward the town centre as the Ashe Road, serving as one of several gateways to the town and providing an immediate urban connection. The Rathgowan Roundabout is the node linking these regional roads.

North and west of the site lie agricultural environs. The lands to the northwest are zoned *Agricultural*, while the large area to the northeast of the site and south of Brookfield Estate is zoned *Open Space*. Further to the south, across the R493, the lands are zoned *Parkland*. With these designations, it can be anticipated that nearby lands will retain some degree of openness and potential recreational activity.

Beyond these two open areas mentioned above, both north and west of the site, residential development in the form of housing estates flanks the R394 northeast and southwest of the site. This has gradually evolved the local character from rural into suburban.

The 2014-20 Mullingar Local Area Plan contains three maps that are valuable when creating a landscape character baseline. These include the Open Space Map (map 04), Greenway Map (map 05) and the Natural Heritage Map (map 08). The site is not designated within any of these maps or contain protected trees or watercourses.

On a larger scale, per the 2021-27 Westmeath County Development Plan, the site is not in the High Amenity Area and the nearest Protected Views (no. 19, 21, 22) are oriented away from the site. An existing Cycle/Walking Route is identified (relief road), but most recreational amenity follows the Grand Canal route.

There are a number of Protected Structures (RPS) within Mullingar Town, but only two have potential intervisibility. *Columb Barracks* (RPS 019-021 to 036) is a cluster of 15 no. protected structures 200m

southeast of the site. However, the high perimeter walls prevent views to the site from within the complex. Views from outside the walls should be considered. The second structure is *Barrack View House* (RPS 019-020) 30m south of the site.

One period home on the National Inventory of Architectural Heritage (NIAH) list is near the site. *Rathgowan House* (NIAH 153310001) sits 225m northwest of the site boundary. The house is no longer extant, but has yet to be removed from the NIAH database. It should be noted that *Barrack View House* listed in the RPS above has been de-listed from the NIAH database (formerly NIAH 15310002). A cluster of buildings at the St. Mary's Hospital complex (both RPS and NIAH) sits 600m to the northeast.

The nearest Archaeological Feature (protected under the National Monuments Act) is a Standing Stone (WM01464) 240m to the southeast, located in the carpark of the Tesco. A Ringfort (WM019-046) lies 580m west of the site surrounded by agricultural pastures within the Sarsanstown townland.

Prior to the establishment of the Relief Road (R394) the site would have been viewed as backland agricultural parcels only seen in the distance from the Ashe Road. The construction of the R394 has created a large public road frontage. To date, this has been undeveloped and forms the largest undeveloped residential parcel along the R394.

Adjacent to the site, the R394 offers an established broad footpath and road level cycle lane, evident in use by both modes of transport during site visits.

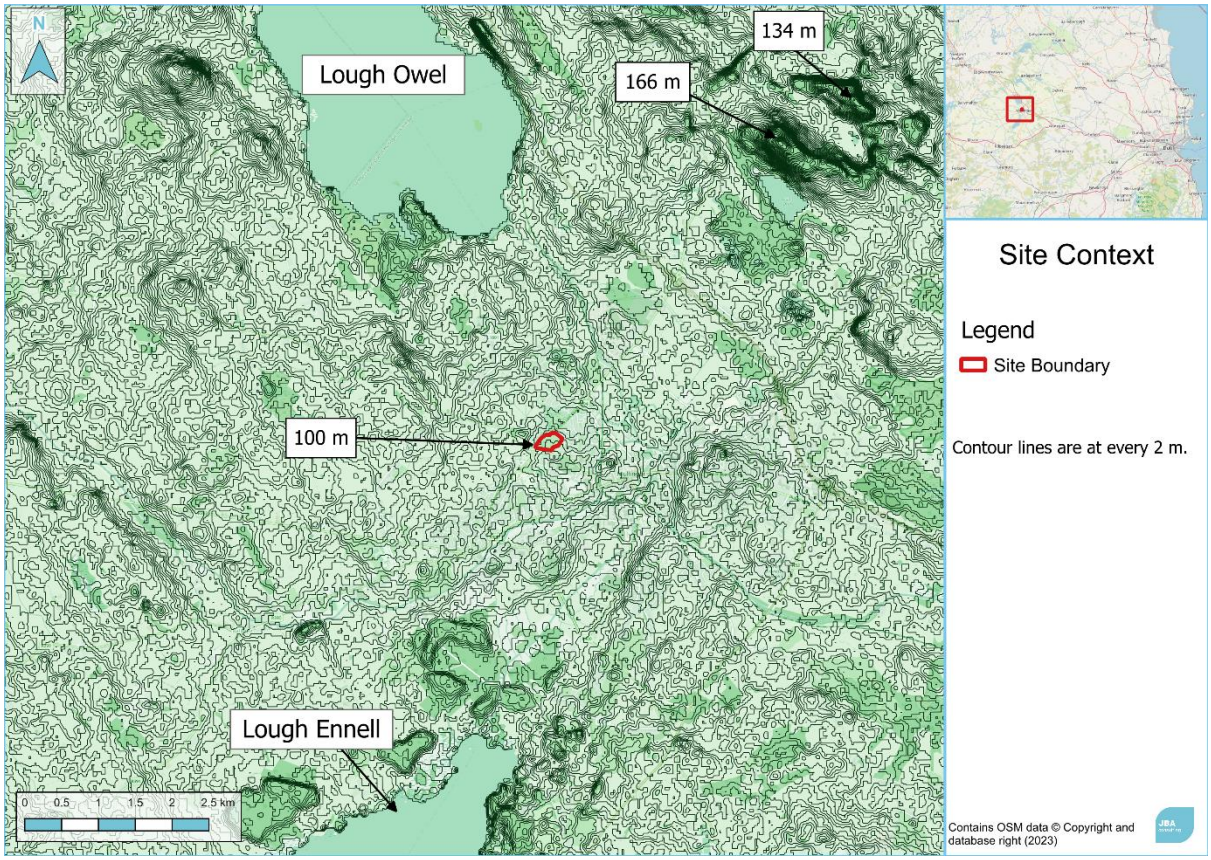

Figure 10.1 Site Context. The site context shows the location of Lough Owel and Lough Ennell in relation to the site. Terrain is generally flat with the landscape becoming more rugged to the north and around the lakes.

10.2.2 Receiving Environment - Site

The site is located on gently rising terrain at the fringe of town centre suburban residential development. The field sizes and parcelling have remained the same since the 6-inch Ordnance Survey maps in the mid 1800's. The R394 was constructed generally along the old field boundary (also the townland boundary) Four different types of boundaries characterise the site.

Northeast and southeast Boundary – Treelines separate the site from Ashefield Estate which hugs the boundary from the northeast around to the south east. A recent development block of apartments (Ref: 19/6121) sits at the southern corner of the site.

North Boundary - The R394 forms the northern boundary, beyond which lies lands zoned as *Open Space* in the Westmeath CDP. Directly to the northwest lies lands upon which construction of Phase 3 of the scheme is currently underway. The site boundary is defined by a sod/stone ditch topped by a mature hedgerow. Most of the trees are Ash, supplemented with Hawthorn and Blackthorn. This hedgerow forms an identifiable boundary to the *Open Space* and is a strong visual buffer for views from the east.

South Boundary – The R393 (Ashe Road) runs directly adjacent to the southern boundary. Accessed from the R393 is an ESB substation which links with the overhead electrical cable poles present within the site.

West Boundary – The western boundary forms a corner which forms a fork between the R394 and R393 at the Rathgowan Roundabout. There are sub shrubs and tall grasses within the site but no hedgerows or treeline. The view from the roundabout is clear.

Internal Tree Line – Within the site, a row of substantial Ash trees (no. 4557-4563) visually reduces the scale of the site and is regularly visible from many of the view receptors. In the Tree Survey report, all trees are graded as "B2" quality, the highest grading on site. As Ash trees, they are late to come into leaf and early to go out of leaf.

It is worthwhile noting that the Tree Survey report did not grade any trees on site as category "A". The highest grading is "B2". 75% of the trees on site have been categorised as "B2", with no trees in such a poor state of health to be categorised as "U" trees (Unsuitable for retention).

Native wildflowers, in particular Ranunculus, appear as part of the natural seed bank.

10.2.3 Zone of Theoretical Visibility

A Zone of Theoretical Visibility (ZTV) was produced for the assessment. The ZTV gives an indication of the surrounding landscape with potential visibility of the proposed development site. For this site, the ZTV maps the area with potential visibility within a 3 km radius from the centre of the site. The ZTV was based on a viewer height of 1.6 m and building heights of 10 – 13 m. The ZTV is based on a digital terrain model (DTM) and represents a bare ground scenario i.e., with no trees, hedgerow or built features present that would provide screening.

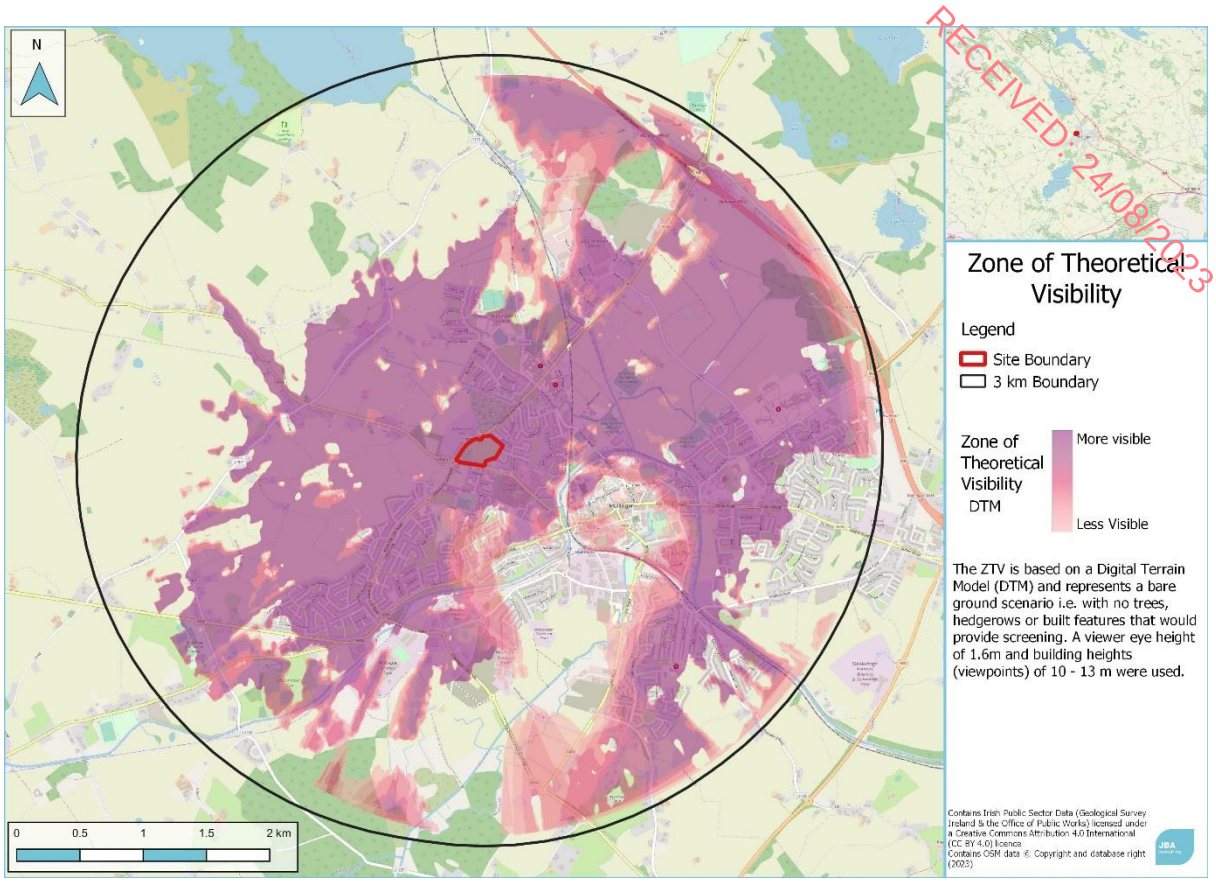

Figure 10.2 Zone of Theoretical Visibility. The ZTV is based on Digital Elevation Models (DEMs). The Digital Terrain Model (DTM) represents a bare ground scenario i.e., with no trees, hedgerows or built features that would provide screening. A viewer eye height of 1.6 m and building heights (viewpoints) of 10 - 13 m were used.

10.3 Characteristics of the Project

Glenveagh Homes Ltd. is seeking planning permission to develop 1& 2 phases of housing, where permission has been granted for phase 3 on adjacent lands on the opposite side of the R394. For the overall project description refer Chapter 2. Interventions and proposals specific to the landscape character and potential impact on visibility are described below.

Modifications to Existing Conditions

The existing hedges and treeline forming the northeastern, eastern and southeastern boundary are to be entirely retained within the development plan with additional planting scheduled. This would result in a slight modification of the existing environment for several nearby receptors. The removal of the internal treeline and hedgerow is noteworthy as these are effective screening elements for receptors to the west.

All overhead ESB wires are to be relocated underground except for one large tower in between the ESB substation and the new block of apartments at the southern corner of the site. These cables and poles are unsightly and their relocation will prove to be an improvement in environmental conditions for receptors to the south.

10.3.1 Proposed Development

The proposed development aims to provide an integrated residential scheme consisting of various house types. No structures appear taller than 3-storeys. The structures are set within a landscape that has a strong emphasis on high quality amenity spaces and a north-south biodiversity link along the R394 and east west along the boundaries. There is significant change to the R394 road frontage and more than 240 semi-mature trees are proposed for planting. The proposed landscape works are illustrated in the Appendix drawing no. LA-104 "Proposed Landscape Masterplan".

Computer Generated Images (CGI's) have been produced for the project, illustrating the internal landscape design and housing style and density.

Internally there are 3 no. large active amenity areas, one includes a children's play area and teen area. Several attenuation buffers underlie green spaces and wild areas two of which flank the entrance from the northern roundabout along the R394. Overall, open space amenity constitutes a higher than average percentage and is considered within statutory parameters.

Tree planting serves to enhance the urban realm and provide commuting links to the various habitats. The aim is to improve visual screening while enhancing biodiversity. The majority of the proposed planting is deciduous at an approximate ratio of 4:1 deciduous to evergreen. There are pockets with clusters of entirely native species and urbanised zones where all of the trees are non-native, for performance in urban conditions. To balance, half of the trees and shrubs will be native. With the embargo on the movement and planting of Ash trees due to *Ash Dieback* disease (Hymenoscyphus fraxineus), none are specified. It is noted that some of the non-native species could, in time, be replaced by Ash if the embargo is lifted. Table 10.3 outlines some of the proposed tree species.

Table 10.3 Tree Species Overview

Tree Planting Species – General Site	
Acer pseudoplatanus (*Sycamore Maple*) 8.5%	Prunus species (*Wild and Bird Cherry*) 15.2%
Amelanchier x grandiflora (*Robin Hill*) 7%	Quercus species (*Oak*) 15%
Betula species (*Birch*) 21%	Sorbus aucuparia (Rowan) 11.8%
Crataegus species (*Hawthorn*) 8.5%	Syringa vulgaris (Common Lilac) 6%
Pinus sylvestris (*Scots Pine*) 3.4%	Other species 4.2%

10.4 Predicted Impacts

10.4.1 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 EIA will be focusing on potential significant and profoundly significant impacts and secondarily on impact 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 10.3 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.

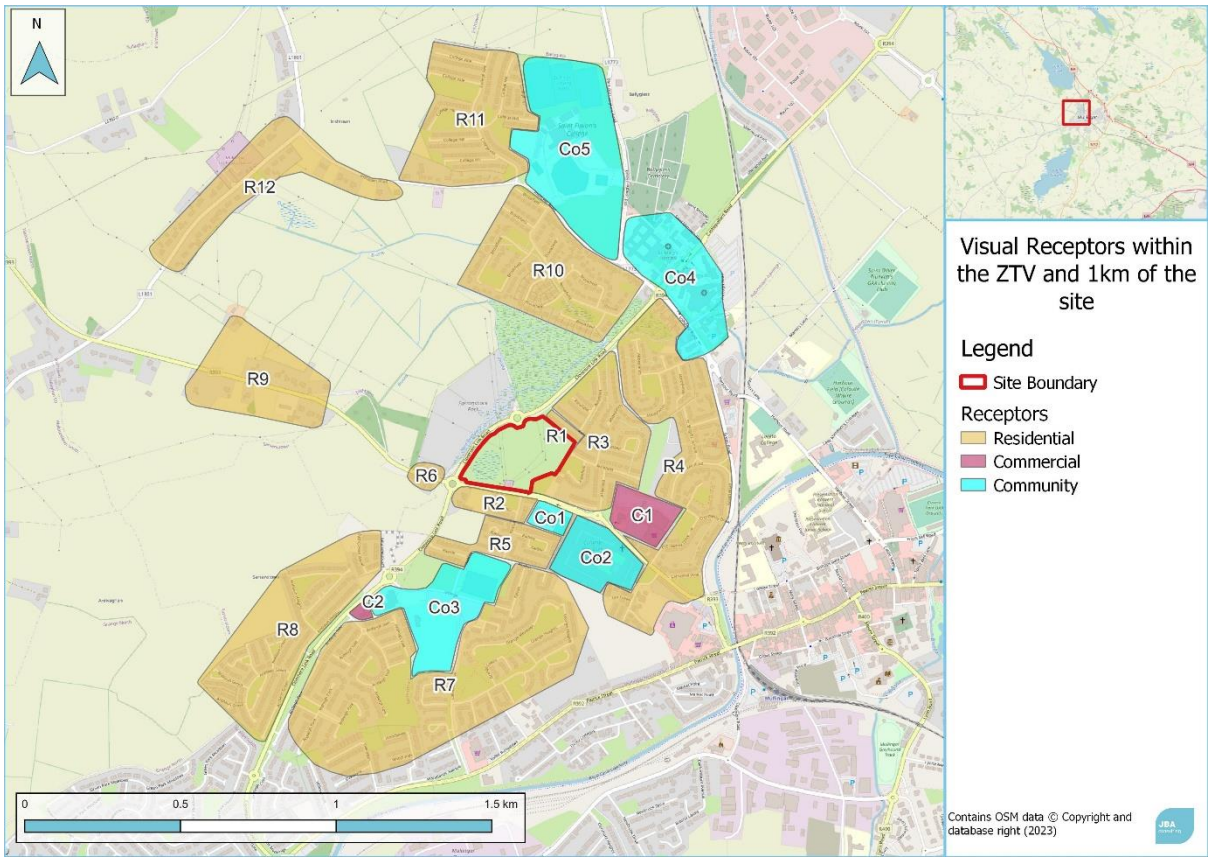

Figure 10.3 Visual Receptor Plan. Receptors fall within an approximate 1 km radius from the site.

7 no. photomontages have been produced showing the expected visual impact of the proposed development from selected points around the site. In photomontages where the proposed development is not clearly discernible, an additional image is included where a white line represents the outline of the extent of proposed buildings. This provides a sense of the degree of screening. The compendium of photomontages is presented in Appendix 10.1 of this EIAR.

With regards *Impact Duration*, impact 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. New woodland tree planting at the eastern end of the site would in itself become a permanent screening feature due to size and density. Street tree planting was considered to have filtering contribution, but as a single tree layer was not a permanent screening element. In this appraisal, *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 association. A negative *Type of Impact* might occur if for example, the proposals diminished the experience of the R394, diluted the character or perception of Mullingar town or had detrimental impact on large volumes of quality existing trees.

10.4.2 Receptor Descriptions

Table 10.4 Visual Impact Summary Table

Receptor No.	Title of receptor	Distance from site	Sensitivity	Magnitude of change	Predicted impact and duration	
					Construction	Operation
R1	8 houses in Ashefield Estate	0 m	High	Medium	*Temporary, moderate, negative*	*Permanent, moderate, negative*
R2	Houses along R393 south of the site	10m	High	Medium	*Temporary, moderate, negative*	*Permanent, slight, positive*
R3	Ashefield estate and Abbeylands	0 – 250m	High	Low	*Temporary, slight, negative*	*Permanent, slight, negative*
R4	Abbeylands, St. Brigids Terrance, Green Road, O'Growney Drive, Cathedral View, and Fair Green estates	400 – 600m	High	Neutral	*Temporary, slight, negative*	*Permanent, imperceptible, negative*
R5	Raithin Estate	100 – 275m	High	Low	*Temporary, slight, negative*	*Permanent, slight, negative*
R6	Houses along R393 west of the site	50 – 170m	High	Low	*Temporary, slight, negative*	*Permanent, slight, negative*
R7	Farran, Grange Meadows, Grange Heights, Grange Lawns, Grange Village, Grange Crescent, Lakeland Drive, Ardleigh Vale, Ardleigh Park, Oaklawns and Woodlands estates	250 – 1050m	High	Negligible – Neutral	*Temporary, slight, negative*	*Permanent, imperceptible, negative*

Receptor No.	Title of receptor	Distance from site	Sensitivity	Magnitude of change	Predicted impact and duration	
					Construction	Operation
R8	Rathgowan Wood, Ardilaun Heights and Ardilaun Green estates south along the R394	300 – 1050m	High	Low – Negligible	*Temporary, slight, negative*	*Permanent, slight, negative*
R9	Residences northwest along R393	480 – 1110m	High	Neutral	*Temporary, imperceptible, negative*	*Permanent, imperceptible, negative*
R10	Brookfield Estate	300 – 775m	High	Low – Negligible	*Temporary, slight, negative*	*Permanent, slight, negative*
R11	College Hill and College Vale estates	780 – 1250m	High	Negligible – Neutral	*Temporary, slight, negative*	*Permanent, imperceptible, negative*
R12	Residences northeast along L1801 and Irishtown Road.	810 – 1250m	High	Low	*Temporary, slight, negative*	*Permanent, slight, negative*
Co1	Gaelscoil an Mhuillinn	75m	Low	Low	*Temporary, imperceptible, negative*	*Permanent, imperceptible, negative*
Co2	Columb Barracks	180m	High	Low	*Temporary, slight, negative*	*Permanent, slight, negative*
Co3	Mullingar Educate Together, Mullingar Presbyterian Church, Grange United Football Pitch and Mullingar Harriers	250 – 600m	Low	Negligible	*Temporary, imperceptible, negative*	*Permanent, imperceptible, negative*
Co4	St. Marys and Midland Regional Hospital Mullingar	580m	Low	Negligible	*Temporary, imperceptible, negative*	*Permanent, imperceptible, negative*
Co5	Saint Finian's College	700m	Low	Negligible	*Temporary, imperceptible, negative*	*Permanent, imperceptible, negative*
C1	Tesco	220m	Low	Negligible	*Temporary, imperceptible, negative*	*Permanent, imperceptible, negative*
C2	Small commercial cluster including a Spar and butcher	500m	Low	Negligible	*Temporary, imperceptible, negative*	*Permanent, imperceptible, negative*

Receptor No.	Title of receptor	Distance from site	Sensitivity	Magnitude of change	Predicted impact and duration	
					Construction	Operation
OS1	Zoned open space	30m	Low	Low	*Temporary, imperceptible, negative*	*Permanent, imperceptible, negative*
OS2	Rathgowan park	210m	Low	Low	*Temporary, imperceptible, negative*	*Permanent, imperceptible, negative*

R1 (*8 no. houses along the northeast boundary with direct views*) – Distance from nearest site boundary = 0m

These houses are oriented along the northeastern boundary of the site such that views of the site from back, upper storey windows are direct in a southwestern direction. A treeline and hedgerow exist along the northeastern boundary which provide partial screening; however, the trees are deciduous and therefore the screening is seasonal. Several electrical pylons within the site are also clearly visible. Northeastern views from front windows are of surrounding residences in Ashefield Estate.

Photomontage V3 in the attached Photomontage Booklet shows the expected view from this receptor group.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High*.

Magnitude The tallest part of the proposed development is located in the eastern corner of the site adjacent to these houses. The retained treeline in combination with new tree planting will provide partial screening to the built aspect of the development, however, majority of tree species are deciduous and this screening will be reduced in the winter. The visual change for these receptors is moderate as the development will change an open space into a built area. However, the change is in keeping with the surrounding environment which is generally urban with rural elements to the north and west and open space to the north. The overall magnitude of change is *Medium*.

Effect During construction the impact will be **Temporary, Moderate, Negative**. Once operational the impact will range from **Permanent, Slight, Negative** for residences with existing vegetation screening their views to **Permanent**, **Moderate, Negative** for those without screening vegetation. In the winter all impacts to views are expected to be **Permanent, Moderate, Negative.**

R2 (*12 no. residences along R393 to the south of the site*) – Distance from nearest site boundary = 10m

One standalone farmhouse at the southeastern corner of Rathgowan Roundabout and 3 no. houses in Raithin Estate have north facing views directly into the site. Other residences in Rathin Estate have indirect east-west views into western and eastern areas of the site. No treeline is present along this

boundary and views are of the substation, boundary shrubs, internal treeline and electrical pylons. Parts of the R394 can also be seen from across the site. Direct views into the site for houses in Rathin Estate are occupied by the electrical substation located along the R393. Houses in Rathin are oriented around a small green space likely used as a kickabout area for residents.

Photomontage V5 in the attached Photomontage Booklet shows the expected view from this receptor group.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High*.

Magnitude Electrical cables are to be relocated underground and the proposed screen planting to the existing substation will offer an improvement to the visual character of the site. Tree pits at the western corner will improve visual character for the farmhouse and houses with indirect east-west facing views. Views across the site to the R394 will be blocked by the development which may bring a minor sense of confinement. The overall magnitude of change is *Low*.

Effect During construction the impact will be **Temporary, Moderate, Negative**. Once operational the impact will be **Permanent**, **Slight, Positive**.

R3 (*large group of residences of Ashefield Estate and Abbeylands Estate located northeast, east and southeast*) – Distance from nearest site boundary = 0 – 250 m

Houses in this receptor group are oriented relative to the development such that their views are either angled, indirect or screened by other dwellings. They are a combination of detached and semi-detached two-storey houses. A hedgerow and treeline along the southeastern boundary provides a natural screening element for houses located closest to the development in this receptor. While views are facing in a northeast – southwest direction for majority of houses, they are located to the east and share no border with the site. The views are entirely occupied by other houses in the estate. Similarly, views from northeastern houses in Ashefield are screened by R1. There may be some filtered views through gaps. Most views of the site will be of boundary treelines and overhead electrical cables.

Photomontage V4 in the attached Photomontage Booklet shows the expected view from this receptor group.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High.*

Magnitude The development would introduce a built element for houses with angled or partially filtered views that may be too far away or screened to benefit from the existing or proposed treelines, however, this would be a small change is in line with the surrounding environment which is a transition from suburban to rural. The retained treelines and new tree planting will reduce the magnitude of this change for houses closer to the development. The overall magnitude of change is *Low*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent**, **Slight, Negative.**

R4 (*Collection of housing estates to the northeast, east and southeast which includes: Abbeylands, St. Brigids Terrance, Green Road, O'Growney Drive, Cathedral View, and Fair Green estates*) – Distance from nearest site boundary = 400 – 600 m

Houses in these estates share similar degrees of screening from houses in R3, and receptors C1 and Co2. Houses along St. Brigids Terrace and Longford Road northeast and east of the site respectively have will have views towards the development from back upper storey windows. These views will be heavily screened by R3, C1 and Co2. Houses with a north-south orientation have no views towards the site. Views from side windows may be present but will be heavily screened, angled or obscured by other receptors and vegetation present along residential streets within the estates.

The surrounding environment for this receptor is chiefly suburban with houses along St. Brigids Terrance and Longford Road could be characterised as more urban being closer to shops and community amenities.

The lefthand side of Ashe Road is fully developed up to this point (where the landscape transitions to Barrack View House). The presence of the substation and numerous ESB pylons and overhead wires do not full evoke the sense of rural environs. However, looking towards the site there is a layering of mature trees, evoking a distant rural hinterland.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High.*

Magnitude The site cannot be viewed clearly from these receptors, however, once constructed, the tallest elements of the development may be visible along the horizon for some residences with partially screened view. For other houses the development would introduce virtually no change in the surrounding environment. The overall magnitude of change will therefore *Negligible*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent, Imperceptible, Negative.**

R5 (*Remaining houses of Rathin Estate, south-southwest of the site*) – Distance from nearest site boundary = 100 – 275 m

This receptor group includes detached, semi-detached and terraced two storey houses. Most of the houses have a northeast-southwest orientation towards the site. Houses to the east border with Co1, Co2 and R7. To the southwest approximately 32 residences are oriented along a cul-de-sac perpendicular to the R394. To the west lies a large area zoned as parkland and to the south lie disused fields, open space and playing pitches. The area is generally less congested with buildings, however, houses at the east of the receptor group are encompassed by built features and other residences. A small field associated with the farmhouse in R2 is bordered by houses in Raithin along its southern and eastern perimeter. Internal hedgerows and trees are present around old farm buildings. This is separated from the houses by a thick treeline running along the eastern boundary. The pasture and treeline are rural features for houses situated at a transition between urban and rural landscapes.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High.*

Magnitude Views for houses in Raithin are screened by houses further north in R2 or the hedgerows and trees present in the adjacent field. The tops of some electrical pylons may be visible from upper storey windows, however, views to the site are largely obstructed. Some views may be partially screened by trees within the adjacent field. Once constructed, views of the development from houses flanked by more rural features could experience a greater change than houses located closer to suburban elements. The overall magnitude of change is *Low*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent**, **Slight, Negative.**

R6 (*9 no. houses Along the R393 west of the Rathgown Roundabout, west of the site*) – Distance from nearest site boundary = 50 – 170 m

5 no. houses lie at the southwestern boundary of the site for Phase 3 of the development. 4 no. houses are located on the opposite side of the R393. All houses are detached bungalows. Hedges are present around some houses. South of these houses lies a large area of zoned parkland which can be characterised as a tree and shrub studded marshy grassland. The R394 forms a barrier between the development site and this receptor group. Bungalows are fitting within rural settings as their low-lying form can be easily obscured by hedgerows.

Rathgowan House (Reg. 15310001) is a delisted NIAH structure located north of this receptor group. It is shrouded by a small, wooded area that extends in a narrow corridor to the R393.

Photomontage V7 in the attached Photomontage Booklet shows the expected view from this receptor group.

Sensitivity Receptors would be residents in their home and therefore sensitivity is *High.*

Magnitude These houses have no views directly oriented towards the development site. As the houses are bungalows, views are confined to the average eye level. Views from front and back gardens may be clearer, however, hedges and trees around garden boundaries will partially or fully screen these views. The tallest elements of the development will be visible through angled or partially screened views; however, proposed treelines will provide natural elements to the horizon in conjunction with built elements.

For residents, spacious countryside will be populated with suburban features diminishing the openness of the landscape. This may negate a sense of separation and afford a sense of connection to Mullingar town. The overall magnitude of visual change will be *Low*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent**, **Slight, Negative.**

R7 (*Estates to the south and southwest of the development including: Farran, Grange Meadows, Grange Heights, Grange Lawns, Grange Village, Grange Crescent, Lakeland Drive, Ardleigh Vale,*

Ardleigh Park, Oaklawns and Woodlands estates) – Distance from nearest site boundary = 250 – 1050 m

This receptor group covers a large area of suburban residences located on the western outskirts of Mullingar town. They are detached and semi-detached two storey dwellings. The houses are oriented in varying directions around curving residential roads and cul-de-sacs. The site with larger green spaces The R393 (Longford Road) is also a busy Regional Road, but has a slightly different character as a point of arrival from Longford and surrounding villages. A key investigation is understanding when the proposed development might be visible when approaching from the south.

Sensitivity Receptors would be residents in their home and therefore sensitivity is *High.*

Magnitude The visual landscape is suburban, with majority of views of the site fully screened by houses or Co3. Any views present will be angled and partially screened. The overall magnitude of change is therefore *Negligible – Neutral*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Imperceptible.**

R8 (*Estates along the R394 southwest of the site including: Rathgowan Wood, Ardilaun Heights and Ardilaun Green estates*) – Distance from nearest site boundary = 300 – 1050 m

These estates are located along the west side of the R394 as it curves south towards Grange South Roundabout. Dwellings are semi-detached and terraced two storey buildings. Rathgowan Wood is closest to the site, while Ardilaun Green is the furthest. Rathgowan Park is adjacent to the east of Rathgowan Wood. These are also several small green areas throughout this receptor group.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High*.

Magnitude Houses are oriented in multiple directions. Those facing east-west in Rathgowan Wood will have the clearest views although these will be angled and partially filtered by R2 and vegetation present in Rathgowan Park. Moving south along R394 houses are oriented in an east-west direction and overlook R7. Houses located off the R394 are arranged in different directions along cul-de-sacs and curved residential roads. Views from these houses will have a higher degree of screening from houses located along the R394. The tallest points of the development may be visible through angled and obscured views through gaps between houses. The overall magnitude of change will range from *Low – Negligible*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent**, **Slight, Negative.**

R9 (*Residences northwest along R393*) – Distance from nearest site boundary = 480 – 1110 m

The 15 no. residences are located northwest of R6 westbound along the R393. The majority of dwellings are bungalows with several dormers as well. These houses lie beyond the boundary of

Mullingar town and sit within a rural environment. Hedgerow partitioned fields and pastures lie to the north and south. Vegetation is abundant between houses, affording a greater sense of privacy.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High*.

Magnitude Majority of views to the site will be limited to the average eye level as many of the houses are bungalows. Orientation of houses is in a northeast-southwest direction with direct views from front or back windows unlikely. Hedges and trees between houses screen eastern views from side windows. Woodland associated with Rathgowan House also provides a screening element such that the development will be hardly visible from any angle. Therefore, the overall magnitude of change will be *Neutral*.

Effect During construction and operation the impact will be **Temporary**, **Imperceptible, Negative** and **Permanent, Imperceptible, Negative** respectively**.**

R10 (*Brookfield Estate and no.20 houses along Irishtown Road, north of the development site*) – Distance from nearest site boundary = 300 – 775 m

Dwellings are a mixture of detached single and two-storey buildings with front and rear gardens with three central green spaces within the estate. Houses along Irishtown Road (L1773) are bungalows or dormers. Directly southwest of Brookfield is a large area zoned as open space. This estate sits on the northwestern boundary of what is considered Mullingar town. With open fields and pastures to the west and suburban landscape and hospitals to the east. The parkland directly to the south west of the estate is a naturalised pasture and provides an important amenity to the residents.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High*.

Magnitude Houses sharing the border with the parkland have views towards the development site. From rear, second storey windows the development would be visible through angled and partially screened views. Views from houses within the estate will have visibility increasing screened by other houses. The retention of treelines along the north and northeast site boundary will aid in the onsite screening of the development. Further southwest of the open space the construction of phase 3 is currently ongoing. The proposed development is fitting with the expanding suburban setting and the overall magnitude of change will be *Low – Negligible*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent**, **Slight, Negative.**

R11 (*College Hill and College Vale estates and 11 no. houses along Irishtown Road, north of the development site*) – Distance from nearest site boundary = 780 – 1250 m

Houses along Irishtown Road are bungalows with front and rear gardens separated by hedges. They are oriented in a slight northwest-southeast direction Houses in College Hill and College Vale estates are semi-detached and two-storey with front and rear gardens. This receptor also forms the boundary of what is considered Mullingar town. To the north, west and south the landscape is rural. St. Finian

College is situated directly to the east and Brookfield estate lies to the southeast. A Met Eireann weather station is located just off the Irishtown Road to the south. Irishtown road is lined with a thick hedgerow that occupies frontal views from the 11 bungalows. The surrounding fields afford a greater sense of openness.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High*.

Magnitude Views of the development site will be clearest from the 11 houses along Irishtown road. However, visibility is restricted to the average eye level and screened by the thick hedgerow. Views will be increasingly screened as one moves away from Irishtown Road into the College Hill and College Vales estates. The overall magnitude of change will be Negligible – *Neutral*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent, Imperceptible, Negative.**

R12 (*32 no. rural houses along L1801 and L1773 (Irishtown Road, northeast of the site*) – Distance from nearest site boundary = 810 – 1250 m

These houses are located outside of the limit of Mullingar town on a gentle slope descending towards the site. They are detached bungalows and two-storey houses with front and rear gardens and thick partitioning hedges. These residences sit within a rural landscape. Housing is located along roads rather than in housing estates to the north and west, R9 lies to the south across open fields. The environment to the southeast is open fields partitioned by hedgerows and trees. Terrain rises gently to the north and northwest. Mullingar substation is located along the northwest side of the L1801 and is hidden by thick and tall hedges around it's boundary.

Sensitivity Receptors would be residents at home and therefore sensitivity is *High*.

Magnitude The development site sits at a lower elevation from these houses. Tallest elements of the development may be seen from rear windows or gardens for houses situated along the southeast side of L1801. Visibility will be screened by hedgerows present throughout the open fields. The development will integrate well with the suburban character of the outskirts of Mullingar town. It is unlikely to significantly impact the visual characteristics of the views from these houses due to distance and screening elements. The overall magnitude of change will be *Low*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent**, **Slight, Negative.**

Co1 (*Gaelscoil an Mhuillinn, southeast of the site*) – Distance from nearest site boundary = 75 m

Gaelscoil an Mhuillinn is a small Irish speaking primary school located along R393 oriented in a northeast-southwest direction. There are trees to the front and rear and a large green play area to the east. The school sits to the east of R2, northeast of R5, south of R3 and northwest of Co2. It is located in a suburban area strongly characterised by built elements.

Sensitivity Receptors would be students and staff and therefore sensitivity would be *Low*.

Magnitude Views of the development would be angled and screened by trees located around the school and along the southeastern border of the development site. Visibility would be limited. The overall magnitude of change would be *Low*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent, Imperceptible, Negative.**

Co2 (*Columb Barracks southeast of the site*) – Distance from nearest site boundary = 180 m

The barracks house a cluster of 15 no. protected structures (RPS 019-021 to 036). Located along the R393, the barracks has a rich history that dates back as far as 1641. Its use as a military facility ceased in 2012. It is a feature of the Mullingar Heritage Trail. Future development of this site by the LDA is likely however, will not commence before the completion of the proposed development. The site is well connected through public transport with Mullingar train station located 500 m southeast.

Sensitivity Receptors will be site visitors and tourists therefore sensitivity is *High*.

Magnitude The barracks are surround by high walls that obscure any views from within the compound. Visibility from within upper storeys of the compound buildings may be clearer, though views would be angled and partially screened by R2, R3, and R5. The overall magnitude of change will be *Low*.

Effect During construction the impact will be **Temporary, Slight, Negative**. Once operational the impact will be **Permanent**, **Slight, Negative.**

Co3 (*Mullingar Educate Together, Mullingar Presbyterian Church, Mullingar Harriers and Grange United Football Pitch, southwest of the development site*) – Distance from nearest site boundary = 250 – 600 m

Mullingar Educate Together is a three storey L-shaped building accessed from the roundabout south of Rathgowan roundabout along the R394. East Along Grange Crescent is Mullingar Harriers, Mullingar Presbyterian Church and Grange United football pitch. The receptor group is surrounded by residential estates in R5 and R7, and separated from R8 by the R394.

Sensitivity Receptors would be staff and students at the school, attendees of the church and players and spectators on the sports grounds. Receptor sensitivity is therefore *Low*.

Magnitude The proposed development is at a slightly higher elevation than this receptor group and visibility will be obscured by R2 and R5. There may be angled or screened views through gaps particularly from the open spaces of the pitches. The overall magnitude of change is *Negligible*.

Effect During construction and operation the impact will be **Temporary**, **Imperceptible, Negative** and **Permanent, Imperceptible, Negative** respectively**.**

Co4 (*St. Mary's Hospital and Midland Regional Hospital Mullingar, northeast of the site*) – Distance from nearest site boundary = 580 m

These hospitals are located along Longford Road R1773 separated by R394 as Castlepollard Road. The hospitals are situated at the fringe of Mullingar town with a mixed landscape to the northeast and R4 and R10 to the southwest. Co5 is northwest of the hospitals. The Midlands Regional Hospital Buildings are of mixed height with the highest structures reaching 4 storeys. St. Marys hospital is comprised of old converted stone buildings reaching 3 storeys. Both hospitals are oriented in a northwest-southeast direction. The hospitals lie at the same elevation as the development site.

Sensitivity Receptors would be staff and patients, therefore sensitivity is *Low*.

Magnitude Visibility of the development will be minimal due to the orientation of the hospital buildings. Ground level views will be obscured by R3 and R10 and hedges located along the R394. The overall magnitude of change will be *Low to Negligible*.

Effect During construction and operation the impact will be **Temporary**, **Imperceptible, Negative** and **Permanent, Imperceptible, Negative** respectively**.**

Co5 (*St. Finian's College, north of the site*) – Distance from nearest site boundary = 700 m

St. Finian's is a national, mixed, Catholic secondary school at the boundary of Mullingar town. The school is at the edge of Mullingar town confines where the landscape to the north and northwest is dominated by pastures and fields partition by hedgerows. An industrial estate which has been scoped out of this assessment is located to the northeast of the site while to the south lies Brookfield estate. The surrounding environment reflects the transitionary position of the school between suburban and rural areas.

Sensitivity Receptors would be students and staff and therefore sensitivity is *Low*.

Magnitude The school sits upon an undulating terrain unlikely to influence the visibility of the site from the school. Most views will be angled, and partially or fully screened by Brookfield estate. The magnitude of change will be *Negligible*.

Effect During construction and operation the impact will be **Temporary**, **Imperceptible, Negative** and **Permanent, Imperceptible, Negative** respectively**.**

C1 (*Tesco within shopping centre, southeast of the development site*) – Distance from nearest site boundary = 220 m

A small shopping centre housing a large Tesco and several other businesses is located southeast of the site. There is a large car park to the north of the shopping centre. The carpark is bordered by trees on all sides and the shopping centre is surrounded by residences from R3 and R4. Columb Barracks (Co2) lies across the R393 to the southwest. The centre is a single storey building at sits at the same elevation as the development site.

Sensitivity Receptors would be staff and consumers, therefore sensitivity is *Low*.

Magnitude Visibility of the development is obscured by houses and trees in R3. The magnitude of change will be *Negligible*.

Effect During construction and operation the impact will be **Temporary**, **Imperceptible, Negative** and **Permanent, Imperceptible, Negative** respectively**.**

C2 (*Small commercial cluster including a Spar and butcher*) – Distance from nearest site boundary = 500 m

These businesses are adjacent to R7 and Co3 along the R394. There are small grassy verges and trees located along the R394 near the roundabout to the northeast of the businesses. The establishments are situated in a predominantly residential environment.

Sensitivity Receptors would be staff and customers and therefore sensitivity is *Low*.

Magnitude The development may be visible from the small carpark attached to the premises. Views would be angled and partially or fully screened by vegetation, Mullingar Educate Together, R5 and R2. The magnitude of change will be *Negligible*.

Effect During construction and operation the impact will be **Temporary**, **Imperceptible, Negative** and **Permanent, Imperceptible, Negative** respectively**.**

OS1 (*Zoned open space north of the site*) – Distance from nearest site boundary = 30 m

This space has been zoned as open space in the Mullingar Local Area Plan 2014 – 2020. The site is a naturalised pasture with marshy characteristics, and shrubs lining the perimeter. There are no park structures or man-made elements such as pathways. Photomontage V2 in the associated Photomontage Booklet shows the proposed view from the eastern boundary of this open space.

Sensitivity Receptors would be residents of surrounding residential receptor groups. Sensitivity is *Low*.

Magnitude The development will be visible from the space, however, the proposed street tree planting within the proposed development design will provide some screening from street views although the degree of screening will be seasonal. While the space is a green amenity for local residents, it has no significant features or characteristics that set it apart from the surrounding pastures. The extent to which residents avail of the amenity is likely to be low. The magnitude of change will be *Low*.

Effect During construction and operation the impact will be **Temporary**, **Imperceptible, Negative** and **Permanent, Imperceptible, Negative** respectively.

OS2 (*Rathgowan park southwest of the site*) – Distance from nearest site boundary = 210 m

This is a small open space adjacent to Rathgowan Park estate which can be directly accessed by resident of the estate through a walkway which links with the parks internal winding footpath.

Sensitivity Receptors would be residents of surrounding residential receptor groups. Sensitivity is *Low*.

Magnitude The development will be visible from most of the park with possible screening from R2 and R5 at the southern corner. Proposed tree pts at the western corner will provide some screening of the taller elements. The level of screening may vary depending on the season. The magnitude of change will be *Low*.

Effect During construction and operation the impact will be **Temporary**, **Imperceptible, Negative** and **Permanent, Imperceptible, Negative** respectively.

10.4.3 Do Nothing Scenario

The site, which is currently under agricultural use as pastureland, would likely remain under agriculture and resemble its' current condition under the *Do Nothing Scenario*. There are no hazardous trees on site that require removal. Most other elements would evolve naturally (growth, death, regeneration). Due to grazing, natural regeneration is minimal. Without intervention, there is little evidence that new planting would arise, so it can be anticipated that the site would devolve in terms of biodiversity.

10.4.4 Temporary Impact

As witnessed on housing sites across the country, construction of the development would add temporary machinery to the landscape and cause high levels of soil disturbance. With vegetation removed internally, the construction scene will be visible and likely include views of temporary security fencing or hoarding. This is a *Negative* visual and landscape character impact, but it is a *Temporary* one. Implementation of short-term mitigation measures include tree protection measures and the phasing of vegetation removal and replanting. This will help mitigate negative impact on the local community.

10.4.5 Operational Impact

The highest *Permanent* landscape impact is the loss of agricultural land. As low-moderate quality agricultural lands that are increasingly being surrounded by development, loss of land here is perceived as better than loss of other peripheral agricultural land. Secondary *Irreversible* landscape impacts consist of partial vegetation removal along the R394 and within the site, plus an increase in impermeable surfaces and modification of natural drainage patterns. In terms of landscape character, the concept of the Rathgowan roundabout as a gateway node to the town centre is underscored. The R394 would approach it's full density zoning and clearly demarcate adjacent amenity lands for public use. This is viewed as an improvement, resulting in a *Slight, Positive* impact.

The highest operational visual impacts will be experienced by visual receptors closest to the site, particularly those in R1 which have south-facing views over the site. These impacts will be *Slight* to *Moderate Negative,* as described above. Other receptors will generally experience *Slight* to *Imperceptible Negative* visual impacts, due to increased screening and distance from the site.

10.4.6 Cumulative Impact

Cumulative Impact is the incremental impact created by the proposed development in the context of surrounding land uses, recent changes and considered future development. In this chapter, cumulative impact assesses the visual alterations in the landscape and the potential modification to the rural and suburban setting as a result of all recent and proposed development, regardless of who carried or will carry out the actions. In assessing future works, only reasonable, foreseeable actions are considered.

In a larger context, this side of town has experienced significant growth for Mullingar. The R394 provides the infrastructure which appears to allow this growth to function.

The proposed and permitted sites currently function as agricultural spaces. The change to residential housing will have significant landscape character impacts. These developments will solidify the town centre fringe, adding activity to Ashe Road with pedestrians and cyclists. They will also aid in defining the zoned Open Space without reducing the peripheral hedgerows. Biodiversity will be altered on site. But, with the retention of trees and provision of positive landscape road frontage, many of the alterations will be neutralised.

This development is likely to expedite the need for opening up the zoned *Open Space* and *Parkland* areas to the public. This will reside with the local authority, but will be a benefit to the larger community.

10.5 Proposed Mitigation Measures

10.5.1 Mitigation Measures at Design Stage

During the design and construction stages of the project, consideration should be given on how to avoid any adverse impacts on views from the visual receptors and impact on greater landscape character. As with any development, some degree of impact is inevitable and, wherever possible, measures should be identified to mitigate the adverse nature of these impacts. In this instance where there is a public presence and potential for impact on community character, the proposed mitigation prioritises minimising negative impacts at this interface.

- Provide a green link between the adjacent zoned *Open Space* and *Parkland* parcels, north and south of the site. This link shall be min. 10m in width and consist of mixed native species.
- Retain category “B2” trees within the northeast hedgerow, as a visual filter to the *Open Space* lands.
- Retain the Ash trees to the centre of the site that are in excess of 15m height, as a visual backdrop to numerous views.
- Retain the trees along the western boundary adjacent to the Rathgowan House laneway, as they also impact character on adjacent lands.
- Provide a solid buffer to the existing residences at the south end of the site.

- To minimise visual impact, roofing material to any structures to be non-reflective with a dark colour tone.

10.5.2 Mitigation Measures at Construction Stage

- Trees to be retained should be fenced off at the commencement of construction to the specified Root Protection Area (RPA) to avoid inadvertent felling or use of the ground under canopies for construction purposes.
- The attenuation zone adjacent to the R394 should be constructed early in the development and planted 6 months prior to its use as stormwater attenuation, to ensure soil settlement and vegetation establishment.
- Salvaged topsoil should not be stored more than 6 months if kept in piles more than 1m high. Rotate stockpiling to fit this time period, to ensure healthy aerated soil for use in the completed development.

10.6 Residual Impacts

The increased roadside animation and improved landscape character is likely to enhance the identity of the Ashe Road as a town centre gateway road.

The planting of the attenuation zone with native trees and damp meadow wildflowers, along with improved stormwater management, will provide long-term improvement to local habitat and result in a greater diversity of flora and fauna. This is assessed even in the context of development, as the long-term use of lands for grazing imposes its own habitat limitations and environmental impacts.

The proposals provide a visual relationship to adjacent amenity lands and improve the experience for R394 road users.

10.7 Significant Interactions

Recommendations were given to the Landscape Architect with regards the R394 landscape buffer and coordination of trees for retention and removal.

Other chapters cross-referenced in this assessment include the following:

- Chapter 2 – Site Location and Project Description – for coordination of proposed elements of the development
- Chapter 6 – Hydrology – for referencing of proposed attenuation and SuDS measures
- Chapter 12 – Biodiversity – for referencing of existing site and contextual ecology
- Chapter 13 – Cultural Heritage and Archaeology – cross referencing on the status and sensitivity of nearby historic structures

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 11

Material Assets: Waste

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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11 Material Assets: Waste

11.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the Proposed Development on Material Assets: Waste.

This Chapter of the Environmental Impact Assessment Report (EIAR) provides an assessment of the potential impacts of the Proposed Development on Material Assets or physical resources in the environment of human origin including built services and infrastructure comprising waste management and wastewater management.

11.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Arthur Greene of Enviroguide.

Arthur holds a B.A in Geography and Geoscience, as well as a Dual MSc in Ecosystem Science and Policy from University College Dublin and Justus Liebig University. Arthur has carried out EIARs, EIA Screening Reports, CEMPs and in the overall assessment of potential impacts to environmental receptors from a range of developments and has been involved in the preparation of EIA documents for the following projects:

- Large Scale Residential Development at Athlone, County Westmeath;
- Large-Scale Residential Development at Newcastle, South Dublin (Phase 2 and 3); and
- Commercial development at Horizon Logistics Park, Swords, County Dublin.

11.3 Proposed Development

The full description of the Proposed Development is outlined in Chapter 2 'Development Description' of this EIAR. A summary of Construction Phase and Operational Phase activities is provided below.

11.3.1 Construction Phase

All construction works will occur following a phased process. However, the entire Construction Phase will involve site preparation works, the establishment of construction services and the construction of the proposed residential units. Site preparation works will involve site clearance, establishing entranceways and haul roads for vehicles, surveying and setting out, setting up the construction site fencing and compounds.

It is noted the Proposed Development (Phases 1 & 2) assessed in this chapter will form part of a larger three-phase development. Phase 3 of the development (ref 22515) consists of 213 dwellings and a creche and was granted permitted with conditions by Westmeath County Council.

11.3.2 Operational Phase

The Operational Phase of the Proposed Development will consist of the normal day-to-day operations necessary for the management of a residential development and the ongoing maintenance of the dwelling units, operational infrastructure and landscaping features.

11.4 Methodology

Material assets have been defined as *"Resources that are valued and that are intrinsic to specific places, they may be either human or natural origin and the value may arise for either economic or cultural reason"*" (EPA 2002).

This definition was further expanded by the EPA in 2022 in 'Guidelines on the information to be contained in Environmental Impact Assessment Reports' which states:

'The meaning of this factor is less clear than others. In Directive 2011/92/EU it included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material assets can now be taken to mean built services and infrastructure. Traffic is included because in effect traffic consumes roads infrastructure. Sealing of agricultural land and effects on mining or quarrying potential come under the factors of land and soils.

11.4.1 Relevant Legislation & Guidance

The methodology for the assessment takes into account the relevant guidelines, in particular the following:

- Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EIAR) (2022)
- EPA (2021) Best Practice Guidelines for the Preparation of Resource and Waste Management Plans for Construction and Demolition Projects

All phases of the Proposed Development were considered in the assessment of potential impacts on Material Assets within the subject site. Assessment of the likely impact of features of the Proposed Development, was carried out in accordance with the following codes of practice, guidelines, legislation, and plans:

- ESB Networks National Code of Practice for the Customer Interface Version 5 (2021);
- ESB Networks Construction Standards for MV Substation Buildings (2019);
- Irish Water Code of Practice for Water Infrastructure Connections and Developer Services Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2);
- IS EN752, Drain and Sewer Systems Outside Buildings;
- Water Services Acts 2007 to 2017;
- CIRIA Report c753 "The SuDS Manual" (2015);
- Section 3.2 of the Urban Development and Building Heights: Guidelines for Planning Authorities (2018);
- 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;
- Waste Management Acts 1996 to 2011; and
- Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021.

11.4.2 Site Surveys/Investigation

A desk-based study of built services, utilities and waste management infrastructure within the Mullingar and wider County Westmeath study area has been undertaken. 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 the Design Team.

Information on built assets in the vicinity of the Site of the Proposed Development was assembled by the following means:

- ESB Networks Utility Maps;
- Irish Water Utility Plans;
- Gas Networks Ireland Service plans;
- EIR E-Maps;
- Civil Works Design Report (Tobin Consulting Engineers Ltd., July 2023)
- Flood Risk Assessment (Tobin Consulting Engineers Ltd., May 2022);
- Construction Demolition and Operational Waste Management Plan (Tobin Consulting Engineers Ltd., July 2023)
- Preliminary Construction Environmental Management Plan (Tobin Consulting Engineers Ltd., July 2023)

11.4.3 Consultation

Consultations were not deemed necessary as part of this assessment.

11.5 Difficulties Encountered

No difficulties were encountered in the preparation of this Chapter.

11.6 Baseline Environment

11.6.1 Site Location and Immediate Surroundings

The Site is located west of Mullingar town, in the townland of Rathgowan. The Site is adjacent to and east of the R394 road referred to as the 'C-link' Road. The Site is bound along its northern and eastern Site boundary by residential dwellings and by Ashe Road to its south. The Site is bounded by lands designated as 'Existing Residential' and 'Open Space' under Mullingar Local Area Plan 2014-2020 (extended). The main vehicular entrance location for the site is via an access onto the existing roundabout on the R394 (Tobin Consulting Engineers, April 2023).

11.6.2 Wastewater Management

The site is currently a greenfield site and there is currently no existing connection to a public sewer. The closest drainage infrastructure is located approximately 300m north of the Proposed Development on the C-Link Road (R394) (Tobin Consulting Engineers, April 2023). It is proposed that wastewater generated from the Proposed Development will discharge to an existing 225mm ø Irish Water foul sewer which runs within the site along the southern boundary. Due to site topography and level of the existing foul sewer, a pumping station (granted under planning application reference number 22515) is proposed to raise the wastewater generated from dwellings making up the remaining one third of the development (Tobin Consulting Engineers, April 2023).

11.6.3 Waste Management

Westmeath County Council (WCC) is the local authority responsible for setting and administering waste management activities in the area of the Proposed Development. WCC's waste management activities are governed by the requirements set out in the Eastern Midlands Region Waste Management Plan (EMRWMP) 2015-2021. The EMRWMP is a statutory document prepared by the local authorities of the region. It covers the period from 2015 to 2021, after which time it will be revised or replaced. The site is currently a greenfield site and has no existing waste management requirements.

11.7 The 'Do nothing' Scenario

If the Proposed Development is not advanced, the site will remain as a greenfield site. A "Do-Nothing" scenario would result the lands remaining undeveloped, which would cause no significant adverse impact on the Material Assets in the surrounding area.

11.8 Potential Significant Effects

11.8.1 Waste

11.8.1.1 Construction Phase

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. This has the potential to impact on the local waste management network.

A Preliminary Construction Environmental Management Plan (PCEMP) and Construction Demolition and Operational Waste Management Plan (CDOWMP) have been prepared for the Construction Phase of the Proposed Development by Tobin Consulting Engineers Ltd. and will be submitted with the planning application (2023).

The majority of waste arising during the Construction Phase will comprise soil and stone materials associated with the excavation works required for foundations and connections to utilities and services. A member of the construction team will be appointed as the Waste Officer to ensure commitment, operational efficiency and accountability during the Construction Phase of the Proposed Development.

The potential impact from the Construction Phase on waste recovery and disposal is likely to be negative, short-term and minor.

11.8.1.2 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 highly residential in nature, waste collection is commonplace.

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 CDOWMP has been prepared by Tobin Consulting Engineers Ltd. (July 2023) and has been submitted with this planning application. A waste strategy is presented in the CDOWMP which considers legal requirements, policies, and best management guidelines. This plan also demonstrates that the Waste Storage Area (WSA) has been incorporated within the design of the Proposed Development. Implementation of the CDOWMP will ensure that a high level of recycling, reuse, and recover at the Proposed Development during the Operational Phase. All materials that are considered recyclable will be segregated and separated at source to reduce costs from the waste collector and ensure maximum diversion of material from landfill. The waste strategy presented in the CDOWMP will provide sufficient storage capacity for the estimated quantity of segregated waste. The designated WSA will provide sufficient room for the required receptacles in accordance with the details of this strategy.

Residents will be required to separate waste into the main following streams and place the same in bins provided:

- MNR (mixed non-recyclables);
- DMR (dry-mixed recyclables);
- OW (organic waste).

Each bin will be labelled clearly and will be colour coded to avoid cross-contamination. The types of wastes permitted in each bin will be clearly posted within the bin store above the bins. Restricted access will be given to the bin store with only residents of the Proposed Development permitted access via a code/electronic fob. Infrequently generated waste such as textiles/furniture/WEE will be stored on a temporary basis within the resident's unit and disposed of appropriately.

The potential impact from the Operational Phase on municipal waste disposal is likely to be long term, negligible and minor.

11.8.2 Wastewater

11.8.2.1 Construction Phase

A temporary connection is required to facilitate on-site works for all housing developments. Commencement of construction will therefore result in a net increase in the foul water produced at the Site of the Proposed Development. Foul water sewers will be constructed strictly in accordance with Irish Water requirements. Confirmation of feasibility was received from Irish Water on the 03rd

August 2023 (Ref. CDS23002571). The wastewater connection is 'Feasible without infrastructure upgrade by Irish Water' (Tobin Consulting Engineers, April 2023).

Due to the temporary and phased nature of the Construction Phase the likely effect of the Proposed Development on the existing foul water network during this phase is considered to be negative, slight and temporary.

11.8.2.2 Operational Phase

It is proposed that wastewater generated from the Proposed Development will discharge to an existing 225mm ø Irish Water foul sewer which runs within the site along the southern boundary. The Irish Water Confirmation of Feasibility dated 03rd August 2023 was obtained for 200 no. properties (ref. CDS23002571). Irish Water have requested that a new enquiry be submitted in light of the commencement of Phase 3, which has been carried out. However, Confirmation of Feasibility for Phase 3 was obtained subsequent to the Confirmation of Feasibility from Irish Water for the initial Phases 1 & 2 design. In addition, the pumpstation approved within Phase 3 has been sized to accommodate the flows from Phase 1 and 2. Therefore, a minimal risk of a negative response from the Utility Provider is expected (Tobin Consulting Engineers, April 2023).

11.9 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 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.

Table 11.1 details the existing, proposed and granted planning permissions on record in the area which have been considered for potential cumulative impacts with the Proposed Development. The Proposed Development will increase the impact on the existing Material Assets. Having regard to other permitted developments in the area, which are either under construction or where construction has not yet commenced, there is potential for greater impact arising from the demand of additional population living in the area.

Table 11.1 Nearby permitted or pending planning applications

Planning reference	Location relative to the Proposed Development	Development description
22515	North of the C-Link Road	Permission for the following Large-Scale Residential Development comprising of the construction of 213 no. residential units, 1 no. creche, 1 no. pumping station and all associated ancillary development works including 2 no. ESB sub-stations, footpaths, cycle lane, car and bicycle

Planning reference	Location relative to the Proposed Development	Development description
		parking, drainage, bin storage, landscaping/amenity areas and the undergrounding of existing 38KV overhead electricity lines at Rathgowan, Mullingar, Co. Westmeath. Access will be via the existing roundabout on the R394 (C-Link). This development will form Phase 3 of a larger (three-phase) residential development at this location.
Part 8 Application	0.3km east of the Proposed Development.	Part 8 application for the construction of 22 no. dwelling units adjacent to Ashfield/Abbeylands/Green Road and St. Bridget's Terrace, Mullingar, Co. Westmeath.
Part 8 Application	2km east of the Proposed Development	The construction of 17 no. dwelling units on a site at the junction of Delvin & Robinstown Road, Springfield TD, Mullingar, Co. Westmeath.
Part 8 Application	0.8km south of the Proposed Development.	The construction of 15 no. single storey houses on four separate sites at Ennell Court and Trinity Cottages, Mullingar, Co. Westmeath.
Part 8 Application	1.3km east of the Proposed Development.	Proposed Housing Development of 32 no. dwelling units consisting of 19 no. 2 bed units and 13 no. 1 bed units at Friar's Mill Road / Canal Avenue, Mullingar, Co. Westmeath.
21568	0.6 km northwest of the Proposed Development Site.	An extension of duration was sought for 16/6001: planning reference no: 11/5121 for the construction of a new housing development, consisting of 28 no. houses to be constructed in 3 phases made up of a combination of 26 no. detached 2 storey houses (as per condition no.5 of outline permission planning ref. no. 11/4121) with associated services.
196159	This site lies 1.8km south of the Proposed Development.	Planning permission was sought for the construction of 98 no. residential units consisting of 14 no. 2 bed terraced houses, 10 no. 3 bed end-terraced houses, 12 no. 3 bed semi-detached houses, 8 no. 4 bed semi-detached houses and 54 no. duplex units (comprising 27 no. 1 bed units and 27 no. 3 bed units). Provision of a creche and community facility, 142 no. car parking spaces, 8 no. motorcycling spaces and 102 no. bicycle spaces. Access from the R390. All site development and servicing works, bin stores, ESB substation, pumping station, open space, landscaping and boundary treatments.
196121	Directly east of the Proposed Development.	Planning permission was sought for the construction of 18 Apartment units in 2 Blocks (Block A & B). Block A consists of 1 no. 1 bedroom units, 3 no. 2 bedroom units and 2 no. 3 bedroom duplex apartment units in 2 and 3 storey high building with private balconies and patios. Block B consists of 6 no. 1 bedroom units and 6 no. 2 bedroom duplex apartment units in 3 storey high building with private balconies and patios. The Proposed Development will also consist of a new site entrance, shared access road, footpaths, car parking spaces, boundary wall and fence, covered cycle rack, recycling bin storage area, public and private open spaces, partial removal and trimming of existing hedgerows to accommodate proposed site entrance, landscaping and all associated site works and services.

The cumulative effects of the Proposed Development on Material Assets have been assessed taking other planned, existing, and permitted developments in the surrounding area into account. Good construction management practices, as detailed in the PCEMP and CDOWMP, (Tobin Consulting Engineers Ltd., July 2023.) will minimise the risk of pollution and nuisance arising from construction activities at the Site. The works will be carried out in such a way that inconvenience to the public arising from increase in traffic flows and disruptive effects of construction traffic on local and main roads is limited wherever practical. Each of the developments that have been permitted in the vicinity of the site (detailed in Table 11.1) are subject to conditions, which, when considered in conjunction with the Proposed Development, it is predicted that the cumulative effects the Proposed Development on construction and municipal waste will be negligible.

11.10 Mitigation

11.10.1 Waste

11.10.1.1 Construction Phase Mitigation

The Contractor will be required to follow all guidelines in the PCEMP and CDOWMP (Tobin Consulting Engineers Ltd., July 2023), subject to approval by Westmeath County Council for the duration of the Construction Phase of the Proposed Development. This PCEMP and CDOWMP will contain the necessary measures for amelioration and remediation during the Construction Phase of the Proposed Development.

11.10.1.2 Operational Phase Mitigation

As outlined in the CDOWMP (Tobin Consulting Engineers Ltd., July 2023) for the Proposed Development, it is intended to ensure that the highest possible levels of waste reduction, waste reuse and waste recycling are achieved for the Proposed Development. Specifically, the CDOWMP will aim to achieve waste prevention, maximum recycling, and recovery of waste with a focus on diversion of waste from landfill wherever possible. The Management Company will be responsible for the provision of a leaflet to all new tenants encouraging good waste segregation and pictorial information detailing the waste streams that can be placed in each bin. In addition to this, clauses that support waste segregation targets will be included in relevant legal documentation e.g., tenancy agreements where possible. The CDOWMP also states that the facilities management company must employ suitably permitted or licenced contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contractor handle, transport and reuse / recover / recycle / dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities.

11.10.2 Wastewater

11.10.2.1 Construction Phase Mitigation

Specific avoidance, remedial and mitigation measures to be taken during the Construction and Operational Phase with respect to foul water and wastewater are detailed within Chapter 7 Hydrology and Hydrogeology, of this EIAR. All works will be carried out in accordance with the PCEMP/CDOWMP (Tobin Consulting Engineers Ltd., July 2023) prepared for the Proposed Development and the Irish

Water Code of Practice for Water Infrastructure (July 2020) and the Irish Water Code of Practice for Wastewater Infrastructure (July 2020). Laying of watermains/wastewater sewers and testing of pipelines and infrastructure will be in accordance with Irish Water standard details.

11.10.2.2 Operational Phase Mitigation

It is proposed that wastewater generated from the Proposed Development will discharge to an existing 225mm ø Irish Water foul sewer which runs within the site along the southern boundary. A new manhole will be constructed on the existing sewer at the point of connection. Approximately two-thirds of the site will drain under gravity to this location. A factor of 6 times the dry weather flow was used to determine the relevant pipe requirements, with loading rates for the development in accordance with the Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03) - Wastewater Flow Rates for Design (Tobin Consulting Engineers, April 2023). All flow velocities within the proposed gravity foul drainage network fall within the limits of 0.75 and 2.5m/sec as set out in Irish Water Code of Practice for Wastewater Infrastructure.

11.11 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. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment.

Having regard to the prevention and mitigation measures proposed within this and other chapters of the EIAR, no significant residual impacts are anticipated.

11.12 Risk of Major Accidents or Disasters

11.13 Significant Interactions

The interactions between Material Assets: Waste and other environmental receptors addressed in this report are as follows:

11.13.1 Population and Human Health

In the absence of mitigation, the improper removal, handling and storage of waste could negatively impact on the health of construction workers.

11.13.2 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 14 Biodiversity. Appropriate waste management practices on Site will ensure no significant effects occur on local biodiversity as established in the PCEMP/CDOWMP (Tobin Consulting Engineers Ltd., July 2023).

11.13.3 Hydrology and Hydrogeology

All connections to the public water network (water supply or foul sewer), abstractions from water supply and discharges to the foul sewer during the Construction and Operational Phases will be under consent from Irish Water. An assessment of the potential impact of the Proposed Development on Water are addressed in Chapter 6 Hydrology and Hydrogeology of this EIAR.

11.13.4 Traffic

Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the local areas. An assessment of the potential impact of the Proposed Development on Traffic are addressed in Chapter 12 of this EIAR. Chapter 12 has concluded that the residual traffic impacts associated with the Proposed Development will be low having an imperceptible effect on the existing road network.

11.14 References & Sources

Eastern-Midlands Region (EMR) Waste Management Plan 2015-2021

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

EPA (2021) Best Practice Guidelines for the Preparation of Resource & Waste Management Plans for Construction & Demolition Projects

EPA (2002) Guidelines on the information to be contained in Environmental Impact Statements.

ESB Networks (2021) National Code of Practice for the Customer Interface Version 5

European Union (Waste Directive) Regulations 2020.

Health and Safety Authority (2010) Code of Practice for Avoiding Danger from Underground Services

https://siteviewer.comreg.ie/#site/1318/53.3334867275/-6.2920326981/1/Site%201318 viewed online 29/05/2023

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http://mywaste.ie viewed online 29/05/2023

https://epawebapp.epa.ie/terminalfour/waste/index.jsp viewed online 30/05/2023

http://www.nwcpo.ie/permitsearch.aspx viewed online 26.07.2022

Irish Water Code of Practice for Water Infrastructure Connections and Developer Services Design and Construction Requirements for Self-Lay Developments July 2020 (Revision 2)

Waste Framework Directive (Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste) as amended by Directive (EU) 2018/851.

Waste Management Acts 1996 to 2011

Water Services Acts 2007 to 2017

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 12

Material Assets: Traffic & Transport

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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12 Material Assets: Traffic & Transport

12.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development at Rathgowan, Mullingar in County Westmeath on the existing local transport network and to review whether the proposed site access (and the existing junctions which fall within the scope of the study) will have adequate capacity to carry the development traffic and the future growth in existing road traffic to the design year and beyond and to also identify possible mitigation measures to reduce traffic impacts. An assessment of the accessibility of the site for cyclists, pedestrians and public transport users has also been made.

This section is written as a concise summary of the Traffic and Transport Statement, included as Appendix 12.1 of this EIAR. Rather than repeat the detailed traffic assessments carried out within this Traffic and Transport Statement, it is referred to throughout this chapter, with the impact assessment findings discussed below.

12.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Juliana Cardoso of TOBIN Consulting Engineers and reviewed by Gabriela Iha and Maria Rooney of TOBIN Consulting Engineers. TOBIN Consulting Engineers are in operation for over 70 years and have carried out numerous Traffic and Transportation Assessments (TTA's) for various residential, commercial, business, retail and leisure developments. TOBIN has also Traffic Chapters for a number of EIAR's for various project types.

Juliana Cardoso (Graduate Engineer at Roads and Traffic) has a Bachelor of Engineering in Civil Engineering and Master of Science in Transportation Engineering.

Gabriela Iha (Design Engineer at Roads and Traffic) has a Bachelor of Engineering in Civil Engineering and Master of Science in Sustainable Transport and Mobility. She has over five year's work experience in the roads and transport engineering. Gabriela has undertaken numerous Traffic and Transportation Assessments (TTA) and EIAR Traffic Chapters for various developments.

Maria Rooney (Senior Engineer at Roads and Traffic) is a Chartered Engineer and has a Bachelor of Engineering in Civil Engineering and Master of Engineering in Roads and Transport Engineering. She has over nine year's work experience in the roads and transport engineering.

12.3 Proposed Development

The proposed development will consist of 181 residential units and a full description of the development can be found in Chapter 2 of the EIAR. The development will deliver a residential neighbourhood within proximity of Mullingar Town Centre. The site will have direct vehicle access to the R394.

Site access of the proposed development will be gained through an existing roundabout onto the R394. The proposed access roads width is 5.5m with 2m wide footpaths on both sides of the proposed

internal road. The internal roads and footpath layouts of the development has been designed in accordance with the Design Manual for Urban Roads and Streets (DMURS).

12.3.1 Parking Provisions

The car parking provisions at the site have been proposed as follows:

- 265 Car parking Spaces for Residential Units

The bicycle parking provisions at the site have been proposed as follows:

- 300 no. Bicycle Spaces for Residential Units (1 per room)

12.3.2 Road Safety Audit

A road safety audit has been carried out by CST Group Chartered Consulting Engineers independently from the design team on the proposed development. The Audit identified a number of items which were reviewed by the Design Team and the design amended where necessary. The recommended measures and proposals were agreed and signed off by the Designers, Client, and Auditors. The final site layout provides a roads network throughout the development which incorporates measures that ultimately provide a high level of safety for both the pedestrian and the driver without comprising the overall quality of the development. Swept path analysis has also been carried out to ensure vehicles can manoeuvre safely within the site.

Please refer to the CST Road Safety Audit included as part of this application for further details.

12.4 Methodology

The approach to the assessment of likely significant impacts on traffic and transportation in this chapter accords with policy and guidance at National, Regional and Local level. The methodology responds to best practices, current and emerging guidance, all of which advocate this method of analysis.

A Traffic and Transport Assessment (TTA) has been prepared in accordance with the TII PE-PDV-02045 publication 'Traffic and Transport Assessment Guidelines'. The scope and extent of the TTA was discussed and agreed with Westmeath County Council (as outlined further in Section 12.4.2) and also considered a no. of relevant points and recommendations issued by Transport Infrastructure Ireland (TII) in response to an EIAR scoping request.

Key parameters relating to the traffic modelling carried out included: junctions to be assessed, trip generation, modal shift targets, trip distribution and assessment years. The traffic and transport impact of the proposed development is discussed as part of the assessment. The traffic and transport significance levels and criteria definitions are outlined in Table 12.1.

Table 12.1 Significance Criteria for Impacts on Traffic or Transportation

Significance Level	Criteria
Profound	Profound impacts occurs where there is permanent disruption to transport network
Significant	Significant impact occurs where there is severe disruption to traffic and/or transport
Moderate	Moderate impact occurs where there is medium term disruption to the network or significant increase of traffic flow
Slight	Slight impact occurs where there is noticeable description or an increase in waiting times
Imperceptible	Imperceptible impact occurs where there is temporary distribution or no quantifiable increase in traffic

12.4.1 Relevant Legislation & Guidance

In preparing this chapter, TOBIN Consulting Engineers has referred to:

- Environmental Protection Agency (EPA) Guidelines on the information to be contained in the EIAR (2022),
- The Westmeath County Development Plan 2021 – 2027,
- TII PE-PDV-02045 Traffic and Transport Assessment Guidelines (May 2014); and
- TII PE-PAG-02017 Project Appraisal Guidelines for National Roads Unit 5.3: Travel Demand Projections (October 2021).

12.4.2 Consultation

Tobin Consulting Engineers contacted Westmeath County Council Roads Department in relation to the Previous proposed development (Phase 1 and 2) in June 2020. Westmeath County Council requested that analysis be carried out at the following junctions:

- Junction 1: R394/Midland Hospital (Irishtown Roundabout); and
- Junction 2: R394/Proposed Access Roundabout

In addition, a further discussion with Westmeath County Council took place in April 2023 in relation to Active travel scheme on Ashe Road. The active travel scheme comprises provision of the shared, and combined cycle facilities proposed throughout the development was developed through a collaborative approach with Westmeath County Council. Throughout this consultation the needs of all road users were considered to ensure a safe, enjoyable environment for cyclists, pedestrians, and motorists.

Figure 12.1 Junction Locations

The outcomes of this exercise were incorporated into the Traffic and Transport Assessment and design drawings. A further pre-planning meeting between the design team and Westmeath County Council to discuss the updated development was taken in place on 21st March 2023. The resulting comments were taken on board and amendments to the design were incorporated where possible.

12.5 Difficulties Encountered

A traffic count was carried out by IDASO on Thursday the 26th of September 2019 between the hours 07:00 and 19:00 for the previous Phase 1 and 2 application. It is noted no traffic counts were possible due to COVID-19 Government restrictions. However previous count data was obtained to determine the magnitude of the existing traffic flows the count information was obtained for the following junction:

- R394/Midland Hospital (Irishtown Roundabout)

This survey distinguished between light good vehicles and heavy good vehicles. The traffic count data is included in Appendix C of the TTA report. The results of this survey indicated that the peak traffic

levels through these junctions occurred between the hours of AM Peak (08:15 and 09:15) and PM peak (17:00 and 18:00).

Link-based growth rates (high sensitivity growth rates) were applied to the 2019 traffic flows to determine background traffic flows for the future assessment years. Furthermore, this EIAR chapter has been carried out following completion of EIAR for Phase 3. Phase 3 was also taken into consideration for the traffic analysis.

There were no other difficulties encountered preparing this chapter.

12.6 Baseline Environment

12.6.1 Location and Network Summary

12.6.1.1 Land Use

The proposed development is located on a green field site on the suburban area of Mullingar town. The proposed development is to be accessed via an access from the roundabout on the R394. The proposed site access is situated within an 50km/h default urban speed zone.

12.6.1.2 Existing Road Network

The layout of the local road network is presented in Figure 12.2. The proposed development is bounded to the east by the R394 regional road.

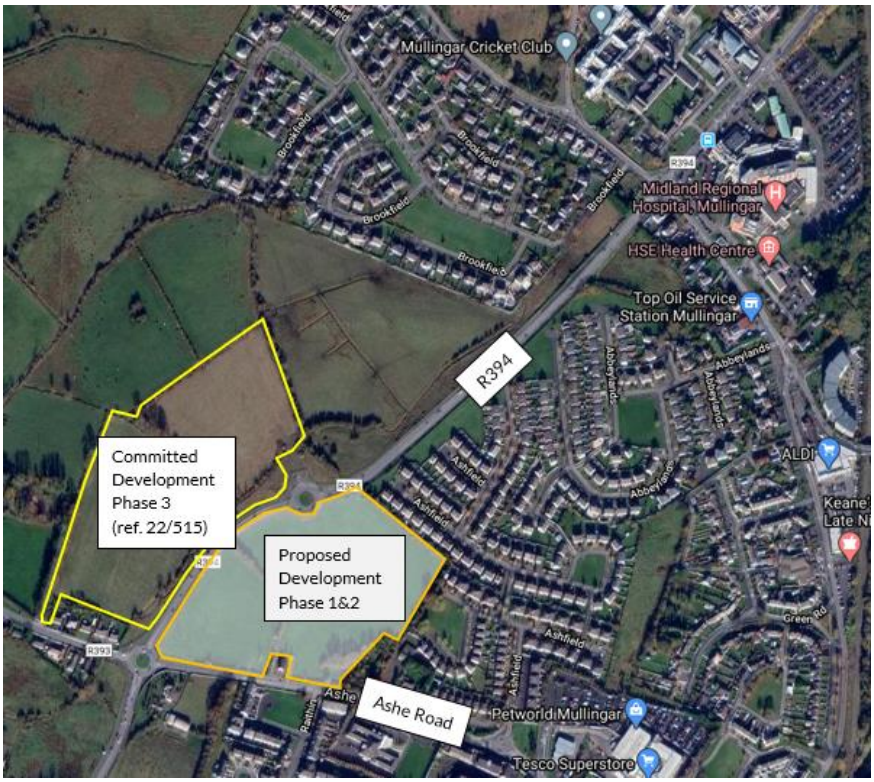

Figure 12.2 Site Location and Surrounding Road Network

A brief description of the local road network and associated junctions is provided as follows:

The R394 regional road is a single carriageway road, approx. 5.6m in width. The R394 connects to the Ashe Road at its south-western end and the N4 national road at its north-eastern end. Both junctions are roundabout junctions.

The walking network in Mullingar is comprised of existing footpaths adjoining public roads. The main approaches to the town have footpaths for pedestrian use only. There is no dedicated cycling network within the centre of the town and cyclists utilise the existing roadway.

There is a pedestrian footway provided along both sides of R394 which connects to the proposed development with pedestrian infrastructure to Mullingar town centre.

There are currently a local bus service operating in proximity to the development located east of the pedestrian access on Ashe Road. The routes include the 448 into Mullingar town. The site is also located within 16 mins walking distance to the train station which provides regular train times for the Dublin to Sligo route.

The proposed development has been set-back to allow for a future two-way cycle lane along the R394 in accordance with the National Cycle Manual. Therefore, two combined cycle lane and pedestrian accesses have been provided along the R394 carriageway.

The provision of the shared, and combined cycle facilities proposed throughout the development was developed through a collaborative approach with Westmeath County Council. Throughout this consultation the needs of all road users were considered to ensure a safe, enjoyable environment for cyclists, pedestrians, and motorists.

12.7 Traffic Growth

The opening year of 2025 was utilised for the purpose of the traffic assessment. In addition to the opening years and in accordance with TII guidelines, the capacity assessment was also based on traffic conditions forecast for the design years 2030 (+5 years) and 2040 (+ 15 years).

The link-based annual growth rates were updated in 2021 by the TII, growth forecasts shown for the county in Table 12.2. The derived growth factors were applied to 2019 traffic flows to determine background traffic flows for the assessment years. The assessment is split into light vehicles and heavy vehicles.

Table 12.2 Growth Factors for light vehicles (LV) and heavy vehicles (HV)

	2025	2030	2040
LV	1.122	1.235	1.392
HV	1.231	1.463	1.816

12.8 The 'Do nothing' Scenario

It shall be noted that the Do-Nothing scenario is equivalent to the baseline environment. The assessment of the existing environment/Do Nothing Scenario, would be a scenario where there is no change to the environment. (i.e., if the development does not proceed).

Traffic count data have been utilised in accordance with the Transport Infrastructure Ireland's (TII) Project Appraisal Guidelines (PAG) - Unit 16 in order to estimate the Annual Average Daily Traffic (AADT) two-way traffic flow on the associated road network. This method is an industry standard as it takes account of seasonal variations that is typically experienced during national public holidays and tourist seasons. In turn, this allows for an informed and representative basis for comparison of project related impacts.

12.9 Potential Significant Effects

The following section outlines the Traffic and Transportation Assessment undertaken in accordance with the TII Traffic and Transportation Assessment Guidelines - May 2014 publication (PE-PDV-02045).

The predicted impact, the mitigation measure required, and the residual impacts are considered under the following headings:

- Do Nothing Scenario
- Construction Phase
- Operational Phase
- Cumulative Impacts

The proposed development will impact on the surrounding roads network during construction and operational stages. It is broadly accepted that operational stage traffic will exceed that of construction stage traffic and will be potentially less manageable in terms of avoiding peak hour traffic periods. Therefore, traffic models of the proposed development access junctions as well as the existing Junctions 1 and 2 have been developed with operational phase traffic presenting a worst-case scenario.

12.9.1 Assessment Year

TII Traffic and Transportation Assessment Guidelines sets out the required assessment years and time periods to be assessed. In accordance with this guideline document, the following sections detail those proposed in this assessment.

12.9.2 Construction Phase

Construction traffic travelling to the proposed development site will use the N4 and R394. A Traffic Management Plan (which will be completed by the Contractor appointed to the project) for the construction stage will identify haulage routes and restrictions as appropriate in discussion with the Local Authority. A draft Construction Traffic Management Plan is included with the planning application which outlines the preliminary management plan and what will be expected of the Main Contractor's Management Plan at construction stage.

It is estimated a total of 20 HGV per day at busiest period on site, namely the groundworks element of the works during approximate 35 weeks. During non-peak times it is estimated 10 HGV deliveries per day. For a development of this size, it is estimated that 35 - 50 site operatives will be employed during construction works and near completion it is expected that personnel number on site increase to 75 - 150 per day.

The increase in traffic volumes, as a result of construction vehicles visiting the site, is not considered to be excessive and will be spread out over construction period over the three phases of the development. The development has also been designed to minimize cut and fill throughout the site, in keeping the proposed finish floor levels of the units and the proposed road levels as close to the existing ground levels as possible. As a result, the trip generation associated with the exporting and importing of cut and fill material to site is minimised. For further detail on the cut and fill, please refer to Chapter 5 Soils and Geology of this EIAR.

Due to the designated access point off the R394, allowing delivery vehicles to pull off the road into the site, there will be no significant disruption on the traffic flows on the R394 as a result of the construction of the development. It is recommended that all delivery drivers and haulage companies serving the proposed development are provided with instructions/directions on accessing the site from the R394 and the surrounding local road network. Overall, there will be a short-term imperceptible negative impact to local traffic during the construction phase.

12.9.3 Operational Phase

For this application, the Operational Phases as per TII Traffic and Transportation Assessment Guidelines (PE-PAV-02045) are:

Operational Phase

- 2025 - Envisaged Year of Opening,
- 2030 - Year of Opening plus 5 years,
- 2040 - Year of Opening plus 15 years.

The Operational Phase of the development has the largest impact. Tobin Consulting Engineers have procured Trip Rate Information Computer System (TRICS) data for similar sized residential developments in order to inform the trip rate associated with such a development. The estimated total number of vehicular trips generated by the proposed development is shown in the following tables which detail the generated traffic for the AM and PM peak hours.

Table 12.3 and Table 12.4 demonstrate the expected AM and PM traffic generation for committed development and a total of 168 trip movements in the AM peak and a total of 176 trip movements in the PM peak are expected.

A total of 51 AM peak trips and 39 PM peak trips are allocated to the creche element of the committed development. Once the development is fully operational, it is expected that this is an over exaggeration of creche related trips. It is estimated that creche trips will predominately be self-contained within the development, with most of the creche users walking from within the

development site. The creche trip rate shown in the table below has been implemented in the design for a more conservative traffic analysis.

It was envisaged the proposed development trip distribution matches the existing traffic distribution observed during the traffic surveys conducted at each of the junctions.

Trip Rates for the various uses within the development have been determined for weekdays, Monday to Friday, to coincide with the maximum levels of existing traffic on the adjacent road network. The volume of traffic expected to be generated by the committed development for the AM and PM peak hours are shown below in.

Table 12.3 Expected Trip Generation for Committed Development (Phase 3) for AM Peak Hour

Expected Trip Generation for Committed Development (AM Peak Hour)			
Development Type	**No of House/Area**	**Arrivals**	**Departures**
Houses	213 dwellings	29	89
Creche	429 sqm	28	23
Total		57	111

Table 12.4 Expected Trip Generation for Committed Development (Phase 3) for PM Peak Hour

Expected Trip Generation for Committed Development (PM Peak Hour)			
Development Type	**No of House/Area**	**Arrivals**	**Departures**
Houses	213 dwellings	87	50
Creche	429 sqm	17	22
Total		104	72

Table 12.5 and Table 12.6 demonstrate the expected AM and PM traffic generation figures from the various uses of the scheme. A total of 100 trip movements in the AM peak are expected and a total of 116 trip movements in the PM peak are expected to result from the proposed development.

Table 12.5 Expected Trip Generation for Proposed Development (Phase 1&2) for AM Peak Hour

Expected Trip Generation for Proposed Development (AM Peak Hour)			
Development Type	**No of House/Area**	**Arrivals**	**Departures**
Houses	181 dwellings	25	75
Total		25	75

Table 12.6 Expected Trip Generation for Proposed Development (Phase 1&2) for PM Peak Hour

Expected Trip Generation for Proposed Development (PM Peak Hour)			
Development Type	**No of House/Area**	**Arrivals**	**Departures**
Houses	181 dwellings	74	42
Total		74	42

The JUNCTION 10 (ARCADY) assessment of each junction is illustrated below. A complete set of outputs from JUNCTION 10 are included in the TTA Report.

Table 12.7 Junction 1 Results: Site 1 - R394/Midland Hospital (Irishtown Roundabout) AM & PM Peak Hours

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS
	2019 Baseflows									
R394 (N)	0.6	3	0.38	A	F	1	3.48	0.5	A	F
Midland Hospital	62.5	380.17	1.21	F		324.9	2123.84	1.89	F	
R394 (S)	244.5	1595.69	1.55	F		48.7	315.43	1.14	F	
Unknown Local Road	7.7	70.65	0.92	F		1.6	20.72	0.62	C	
	2025 No Development									
R394 (N)	0.8	3.31	0.44	A	F	1.3	4.06	0.56	A	F
Midland Hospital	144.5	958.95	1.46	F		495.4	3324.54	2.31	F	
R394 (S)	374.5	2395.18	1.74	F		100.6	657	1.27	F	
Unknown Local Road	18.5	142.1	1.02	F		2.1	25.01	0.69	D	
	2025 With Phase 3									
R394 (N)	0.8	3.36	0.45	A	F	1.4	4.18	0.58	A	F
Midland Hospital	166.8	1098.27	1.52	F		521.2	3541.99	2.39	F	
R394 (S)	454.4	2859.96	1.84	F		158.4	1050.04	1.39	F	
Unknown Local Road	19.9	149.93	1.03	F		2.2	25.43	0.69	D	
	2025 With Phase1&2&3									
R394 (N)	0.8	3.39	0.45	A	F	1.4	4.24	0.58	A	F
Midland Hospital	175.9	1157.36	1.54	F		532.2	3636.77	2.43	F	
R394 (S)	508.8	3180.47	1.92	F		207.4	1371.76	1.47	F	
Unknown Local Road	20.5	153.08	1.03	F		2.2	25.5	0.69	D	
	2030 No Development									
R394 (N)	0.9	3.67	0.49	A	F	1.7	4.79	0.63	A	F
Midland Hospital	237.3	1620.31	1.69	F		658.6	4581.77	2.77	F	
R394 (S)	497.4	3131.57	1.91	F		162.2	1082.09	1.4	F	
Unknown Local Road	38.2	286.18	1.12	F		2.8	30.77	0.75	D	

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS
	2030 With Phase 3									
R394 (N)	1	3.74	0.5	A	F	1.8	4.96	0.64	A	F
Midland Hospital	265	1814.01	1.76	F		684.5	4830.31	2.88	F	
R394 (S)	575.6	3579.96	2.01	F		232.8	1524.99	1.51	F	
Unknown Local Road	40.3	303.45	1.13	F		2.9	31.39	0.76	D	
	2030 With Phase1&2&3									
R394 (N)	1	3.73	0.5	A	F	1.8	5.04	0.65	A	F
Midland Hospital	275.4	1883.48	1.78	F		695.7	4938.5	2.92	F	
R394 (S)	632.2	3911.84	2.09	F		287	1853.31	1.59	F	
Unknown Local Road	41.2	311.24	1.13	F		2.9	31.49	0.76	D	
	2040 No Development									
R394 (N)	1.2	4.25	0.56	A	F	2.6	6.53	0.72	A	F
Midland Hospital	399.9	2781.2	2.07	F		888.9	6603.02	3.6	F	
R394 (S)	669.5	4193.57	2.15	F		273.6	1786.15	1.57	F	
Unknown Local Road	81	624.64	1.26	F		4.5	44.79	0.84	E	
	2040 With Phase 3									
R394 (N)	1.3	4.29	0.56	A	F	2.7	6.85	0.74	A	F
Midland Hospital	427.6	2986.61	2.13	F		914.5	6898.29	3.75	F	
R394 (S)	750.2	4654.96	2.26	F		347.9	2219.75	1.67	F	
Unknown Local Road	84.6	647.87	1.27	F		4.6	45.2	0.84	E	
	2040 With Phase1&2&3									
R394 (N)	1.3	4.34	0.56	A	F	2.8	7.02	0.74	A	F
Midland Hospital	441.1	3091.66	2.17	F		926.3	7039.42	3.82	F	
R394 (S)	801.3	4919.81	2.32	F		405	2562.3	1.75	F	
Unknown Local Road	85.7	654.64	1.27	F		4.7	45.95	0.84	E	

The above results indicate that the R394/Midland Hospital (Irishtown Roundabout) is currently over capacity, exceeding the maximum desirable of 0.85 RFC in the AM and PM peak. The maximum RFC reaching 3.6 in the PM peak without the development in 2040. The RFC increases by 0.22 in the PM peak with the full development (Phases 1&2&3) scenario to 3.82.

Table 12.8 Junction 2 Results - R394/Proposed Access Roundabout AM & PM Peak Hours

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS
	2019 Baseflows									
1 - R394 (N)	0.4	2.15	0.26	A	F	0.5	2.31	0.33	A	A
2 - Committed Development	0	0	0	A		0	0	0	A	
3 - R394 (S)	38.7	168.57	1.07	F		2.9	19.27	0.75	C	
4 - Proposed Development	0	0	0	A		0	0	0	A	
	2025 No Development									
1 - R394 (N)	0.4	2.25	0.29	A	F	0.6	2.45	0.37	A	B
2 - Committed Development	0	0	0	A		0	0	0	A	
3 - R394 (S)	89.7	446.51	1.21	F		5.1	31.31	0.85	D	
4 - Proposed Development	0	0	0	A		0	0	0	A	
	2025 With Phase 3									
1 - R394 (N)	0.4	2.31	0.31	A	F	0.6	2.55	0.39	A	C
2 - Committed Development	0.4	10.42	0.26	B		0.4	13.01	0.31	B	
3 - R394 (S)	138.7	685.75	1.3	F		8	47.6	0.91	E	
4 - Proposed Development	0	0	0	A		0	0	0	A	
	2025 With Phase1&2&3									
1 - R394 (N)	0.5	2.37	0.32	A	F	0.7	2.65	0.4	A	C
2 - Committed Development	0.4	11.05	0.27	B		0.5	14.36	0.33	B	
3 - R394 (S)	156.1	767.16	1.33	F		9.7	56.94	0.93	F	
4 - Proposed Development	0.2	10.24	0.19	B		0.2	9.52	0.18	A	
	2030 No Development									
1 - R394 (N)	0.5	2.39	0.33	A	F	0.7	2.61	0.4	A	D
2 - Committed Development	0	0	0	A		0	0	0	A	
3 - R394 (S)	165.1	782.61	1.33	F		10.1	57.08	0.94	F	
4 - Proposed Development	0	0	0	A		0	0	0	A	

	AM					PM				
	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS	Queue (Veh)	Delay (s)	RFC	LOS	Junction LOS
	2030 With Phase 3									
1 - R394 (N)	0.5	2.45	0.34	A	F	0.7	2.72	0.42	A	E
2 - Committed Development	0.4	11.52	0.28	B		0.5	14.96	0.34	B	
3 - R394 (S)	222.4	1118	1.43	F		18.8	96.98	1	F	
4 - Proposed Development	0	0	0	A		0	0	0	A	
	2030 With Phase1&2&3									
1 - R394 (N)	0.5	2.52	0.35	A	F	0.8	2.83	0.44	A	E
2 - Committed Development	0.4	12.29	0.29	B		0.6	16.78	0.36	C	
3 - R394 (S)	241.5	1228.32	1.47	F		23.8	117.6	1.02	F	
4 - Proposed Development	0.2	10.26	0.19	B		0.2	9.95	0.19	A	
	2040 No Development									
1 - R394 (N)	0.6	2.55	0.37	A	F	0.9	2.91	0.46	A	F
2 - Committed Development	0	0	0	A		0	0	0	A	
3 - R394 (S)	291.8	1431.57	1.51	F		34	151.53	1.06	F	
4 - Proposed Development	0	0	0	A		0	0	0	A	
	2040 With Phase 3									
1 - R394 (N)	0.6	2.63	0.39	A	F	0.9	3.04	0.48	A	F
2 - Committed Development	0.4	13.3	0.31	B		0.6	19.36	0.4	C	
3 - R394 (S)	365.4	1813.73	1.61	F		55.1	253.36	1.13	F	
4 - Proposed Development	0	0	0	A		0	0	0	A	
	2040 With Phase1&2&3									
1 - R394 (N)	0.7	2.7	0.4	A	F	1	3.18	0.49	A	F
2 - Committed Development	0.5	14.35	0.33	B		0.7	22.51	0.43	C	
3 - R394 (S)	389.4	1934.99	1.65	F		63.7	305.88	1.15	F	
4 - Proposed Development	0.2	10.27	0.19	B		0.2	10.11	0.19	B	

The results in Table 12.8 indicate that the R394/Proposed Access Roundabout is currently over capacity, exceeding the maximum desirable of 0.85 RFC in the AM peak only. The maximum RFC reaching 1.51 in the AM peak without the development in 2040. The RFC increases by 0.14 in the AM peak with the full development (Phases 1&2&3) scenario to 1.65 which results in further 22 seconds in delay.

The existing roundabouts junction are currently over capacity as demonstrated in the preceding tables. The increase in traffic from the proposed development will have a slight effect on the road network during operations. Table 12.9 summaries the impact of the proposed development on the surrounding transport network and users.

Table 12.9 Summary of Impact Assessment

Mode	Cause	Impact
Construction Stage		
Traffic	Increased construction traffic flows onto existing roads network	Short-Term Slight Negative
Walking	Increased construction traffic flows resulting in an increased risk to existing pedestrian movements	Short-Term Not Significant Negative
Cycling	Construction Traffic Flows resulting in an increased risk on the existing cycle network	Short-Term Not Significant Negative
Operational Stage		
Traffic	Development-Generated Traffic added onto surrounding Road Network	Long-Term Slight Negative
Walking	An increase in pedestrian traffic to local schools, shop amenity and sports facilities, and to Mullingar town centre	Long-Term Not Significant Positive
Cycling	An increase in cycle activity utilising existing network	Long-Term Not Significant Positive

12.9.4 Cumulative Effects

Traffic and Transport Assessment (TTA) shall consider all committed developments within the vicinity of the site. This includes sites which have previously been granted planning permission, but which are yet to become operational.

Committed developments granted in the immediate vicinity of the proposed development include PL Ref 19-6121. PL Ref 19-6121 is for the construction of 18 apartments units in 2 blocks (Block A&B). Block A consists of 1 no. 1bedroom unit, 3no.3bedroom duplex apartments in 2 and 3 high building with private balconies and patios. Block B consists of 3 no.1-bedroom units and 6no. 2 bedrooms duplex apartments units in 3 storey high building with private balconies and patios. The proposed development will also consist of new site entrance, shared access road, footpaths, car parking spaces, boundary wall and fence, covered cycle track, recycling bin storage area, public and private open spaces, particle removal and trimming of existing hedgerows to accommodate proposed site entrance, landscaping and all associated site works and services at Ashe Road, Mullingar, Co. Westmeath.

The traffic volumes associated with the above development was reviewed to determine where the distribution of the traffic will overlap with the proposed project. The traffic volumes associated with the committed development was deemed negligible at the junctions assessed. As such, it has been assumed that any increase in traffic will be accounted for in the high sensitivity growth rates.

It is also noted the proposed development (Phases 1&2) assessed in this TTA will form part of a larger three-phase development. Phase 3 of the development (ref 22515) consists of 213 dwellings and a creche and was granted permitted with conditions by Westmeath County Council. This TTA has considered these applications as background traffic as both were granted.

12.10 Mitigation

12.10.1 Construction Phase Mitigation

The Construction Environmental Management Plan (CEMP) includes proposed mitigation measures to minimise the impact of constructed related traffic on the modelled roads network. The construction stage of the proposed development will be complete in three phases as described in CEMP and the project is scheduled to begin construction in 2024 with an estimated duration of 83 weeks. It is envisaged that working hours will be 08:00 am to 19:00 pm Monday to Friday (08:00 am to 14:00 pm for Saturday) for construction personnel through each phase of the development. Generally, construction workers will travel to site before the measured peak hour of 08:00 to 09:00, to be on site for a 08:00 start-time. It is envisaged that a very limited number of construction employees are likely to travel to the site during peak hours.

It is anticipated that heavy goods vehicles, HGV's, will be restricted to movements on the local road network during the off-peak periods. It is estimated that truck movements and general deliveries would arrive/leave at a steady rate during working hours. It is envisaged that during the busiest period onsite, namely the groundworks element of the works, an estimated 8 no. HGV's will deliver to the site daily for the duration of this work element. HGV deliveries are envisaged at other periods during the construction phase, but these are expected to be at a lower frequency. An estimated total of 610 HGV trips are envisaged throughout the course of the construction phase of the works.

A number of mitigation measures are proposed during the construction phase to minimise the impact, the measures are as follows:

- A detailed haulage plan will be put in place to ensure minimal impact on the surrounding road network. Spoil removal from site will be kept to a minimum with a detailed site survey completed to ascertain where spoil can be distributed on the site.
- All deliveries and removals will be subject to stringent site rules governing the loading / off-loading times, location of loading / off loading, covering of loads and cleaning of vehicles exiting the site, etc.
- Delivery loads to and from the site and management of large deliveries on site to occur outside of peak periods.
- No vehicle will be allowed to stop or park on the access road to the proposed development site.

- Ample parking will be provided within the site to cater for the staff and visitors during the construction phases of the proposed development.
- Construction traffic will be managed and scheduled to ensure no queueing occurs on either the internal road system or the main approach roads. The provision of an on-site vehicle staging area will facilitate waiting vehicles.
- Routine sweeping/cleaning of the road and footpaths in front of the site; and
- No uncontrolled runoff to the public road from dewatering/pumping carried out during construction activity.

There will be on-going monitoring of the impact of construction traffic on the wider roads network to ensure prompt action is taken in the event of an issue arising.

12.10.2 Operational Phase Mitigation

Mitigation measures proposed during the operational stage are as follows:

- Provision of "YIELD" road markings at the roundabout access in accordance the Traffic Signs Manual (TII, 2019).
- Suitable Lighting of all junctions with lighting columns being positioned at the back of the footways.
- The connection of the proposed development footpaths to the existing footpath network on the R394. This will allow connectivity to the existing infrastructure.
- The provision of bicycle stands and dedicated cycle routes through the development to encourage cycling.
- Charging points for electric vehicles are being provided.
- A Mobility Management Plan has been included as part of the Traffic and Transport Assessment, submitted as part of this application. This outlines the mobility strategy for the proposed development and includes measures for guiding the delivery and management of coordinated mobility management initiatives by the scheme promotor.

12.10.3 Cumulative Mitigation

None of the construction phase effects are cumulative. This chapter is only in relation to proposed development. Cumulative operational effects are limited to those associated with operational generated traffic.

12.11 Residual Impact Assessment

As population grows throughout Ireland and in particular, in popular commuting hub areas like Mullingar, a continued increase in traffic volumes is not sustainable. The governments modal shift targets are outlined in the Smarter Travel: A Sustainable Transport Future. The key targets of Smarter Travel are to reduce work-related commuting by car to 45%, and increase other modes such as walking, cycling, public transport, and carpooling to 55%. As a result, an ever-increasing approach by designers and planners to providing sustainable commuting alternatives is required. The use of public transport and promotion of walking and cycling will ultimately increase the overall quality of life for people living in these fast paced, busy towns and villages located within commuter belts.

The proposed development has integrated a number of measures in line with the relevant standards and guidelines, such as DMURS 2019 and the National Cycle Manual, which promotes the use of sustainable travel to and from the site. The Road Safety Audit carried out for the site allowed the design team to address any concerns initially flagged in the Road Safety Audit. A continued and collaborative approach with the road safety auditors meant that a desirable and safe site layout could be achieved without negatively impacting the overall quality of the development.

The use of the private car will still be maintained as a primary mode of transport for a number of residents in the development. Trip generations to and from the proposed development are 168 in the morning peak and 176 in the evening peak as noted above. The internal roads on the development to be constructed have been suitable designed in accordance with the DMURS manual.

Progressive and regular liaising with Westmeath County Council Roads Department in relation to the internal roads and the permitted link roads layouts contributed to the final road design for the development.

As noted previously, mitigation measures are to be implemented to promote and encourage more sustainable transport modes. The proximity of the Bus Stops will encourage pedestrians to utilise the higher frequency Public Transport options. Dedicated cycle routes and secure bicycle parking spaces are also provided throughout the development.

The mitigation measures outlined in Section 12.10 would minimise any residual impacts. As construction traffic would be temporary in nature, traffic volumes would return to their pre-construction condition, except for the expected increase in traffic associated with normal traffic growths and the changes in traffic pattern that naturally occur on road networks. The preparation of the Traffic Management Plan would minimise traffic impacts during the Construction Phase.

The residual impacts will relate to the operational phase traffic associated with the proposed development which will be low having an imperceptible effect on the existing road network.

12.12 Risk of Major Accidents or Disasters

Road Collision Data is not currently available on the Road Safety Authority Database, and therefore the audit team has no access to the historical collision information for this site and / or adjacent roads.

12.13 Significant Interactions

Traffic and Transportation interacts with other environmental attributes as follows:

- Air Quality and Climate: Particulates and gaseous emissions from traffic (both on and off-Site) and residual dust dispersal associated with traffic movements have been addressed in the Air Quality and Climate chapter (Chapter 7),
- Noise: The impacts from traffic and transport in terms of noise generation is addressed in the Noise & Vibration chapter (Chapter 9).

12.14 Indirect Impacts

There were no indirect impacts resulting from the traffic generated for the proposed development.

12.15 References & Sources

- European Commission (2017). Environmental Impact Assessment of Projects - Guidance on the preparation of the Environmental Impact Assessment Report.
- National Roads Authority (2014). TII Library. Retrieved from TII Library Website: http://www.tii.ie/tii-library/land-use-planning/Transport-Assessment-GuidelinesMay2014.pdf
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- Westmeath County Development Plan 2021 – 2027.

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 13

Material Assets:

Service Infrastructure & Utilities

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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13 Material Assets: Service Infrastructure & Utilities

13.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of material assets of the proposed residential development. This chapter details the existing environment, the proposed development, and the predicted impact on the environment. It will describe the methodology used to assess the potential impacts from the proposed development on the material assets in the study area, to describe baseline environment of the material assets in the study area, assess the likely impacts on these material assets, and sets out mitigation measures to be put in place to reduce the likely impacts of the material assets on the environment. This chapter considers the impacts on the material assets and not the people using the assets. People along with issues and impacts are discussed in Chapter 4 (Population and Human Health).

This chapter should be read in conjunction with Chapters 5, 6, 8, 9, 10, 11, 12, 16 and 17 of the EIAR and the Civil Design Report, the Outline Construction Traffic Management Plan, the Preliminary Construction Environmental Management Plan, the Construction Demolition & Operational Waste Management Plan and all engineering layouts and details submitted with the planning application and appended to this chapter.

Material Assets are resources that are valued and that are intrinsic to specific places. These may be economic assets of human or natural origin. With regard to Material Assets, the Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022) published by the Environmental Protection Agency (EPA) state:

> *'In Directive 2011/92/EU this factor included architectural and archaeological heritage. Directive 2014/52/EU includes those heritage aspects as components of cultural heritage. Material Assets can now be taken to mean built services and infrastructure.'*

Material Assets of a human origin include:

- Wastewater Network
- Surface Water Network
- Watermain Network
- Electricity Network
- Gas Network
- Telecom's infrastructure
- Waste

It is noted that Roads Infrastructure would also be classified as Material Assets. However, the Impact Assessment of Roads Infrastructure is dealt with in a separate chapter.

The proposed project is described in detail in Chapter 2 'Project Description'.

13.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Ryan Bragge and Michael Naughton (TOBIN Consulting Engineers) and Kieran Morley (Morley Walsh Consulting Engineers).

Ryan Bragge is a project engineer in the Building & Infrastructure sector with TOBIN. He also has over 25 years' experience in the building services industry also working across a number of projects in various sectors. Ryan has a degree in Civil Engineering from the University of Natal in South Africa where he is registered as a Professional Engineer with the Engineering Council of South Africa and is a full member of the South African Institute of Civil Engineering. His membership of Engineers Ireland is pending.

Michael Naughton is a design engineer in the Building & Infrastructure sector with TOBIN. He also has over 19 years' experience in the building services industry also working across a number of projects in various sectors. Michael has an honours degree in Civil Engineering from National University Galway and is a member of Engineers Ireland.

Ryan has been involved in EIARs for the following projects:

- Rathgowan, Mullingar Phase 3 (Glenveagh)
- Letterkenny Regional Sports Activity Hub (ATU Letterkenny)

Michael has been involved in EIARs for the following projects:

- Rathgowan, Mullingar Phase 3 (Glenveagh)
- Drumbiggil, Ennis (Glenveagh)

Kieran Morley is a director and senior building services Engineer with Morley Walsh Consulting Engineers. Kieran has over 16 years' experience in the building services industry and has worked across a broad spectrum of projects and industry sector with a particular focus on large scale residential development. Kieran has an honours degree in Building Services engineering and Post Graduate Diploma in Energy Management both from Dublin Institute of Technology. Kieran is also member of Engineers Ireland.

Kieran has been involved in the preparation of EIARs for the following projects:

- Rathgowan, Mullingar Phase 3 (Glenveagh)

13.3 Proposed Development

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

The study area, which is 5.95 hectares in area, is located within the townland of Rathgowan within the development boundary of the town of Mullingar. The site is located to the northwest of the town centre. It is located to the south of the R394 (known locally as the 'c-link' road) which connects to the N4 to the north and N52 to the south. The site is accessible via the existing entrances off the roundabout on the R394.

The area surrounding the site is characterised by a mix of uses. The lands immediately adjoining the site to the east and south have been developed for residential use and generally comprise two-storey detached and semi-detached dwellings. The R394 or C-Link bounds the site to the north with agricultural land beyond. The site is bounded to the southwest the Ashe Road and an ESB substation. The site is relatively flat and comprises of grass with some hedgerows.

Permission was previously granted by Westmeath County Council for Phase 1 and 2 of a residential development (Planning References: 21/97 and 21/139). Both these phases 1 and 2 are currently at appeal stage with An Bord Pleanála. The current proposed LRD scheme will replace these two previously permitted applications.

Phase 3 of this residential development was granted in January 2023 by Westmeath County Council under the LRD system. This Phase is located northwest of the subject site, on the opposite side of the R394 and coincides with the development area of Phase 1 and 2. The layout, however, differs considerably to that of Phase 1 and 2.

13.3.1 Aspects Relevant to this Assessment

Material assets considered as part of this assessment include the following:

- Watermains
- Stormwater Infrastructure
- Wastewater Infrastructure
- Electricity Network
- Gas Network
- Telecom Infrastructure
- Solid Waste

13.4 Methodology

13.4.1 Relevant Legislation & Guidance

The Material Assets Assessment was prepared in accordance with relevant European Union and Irish legislation and guidance, and in accordance with Schedule 6 of the Planning and Development Regulations 2001 as amended (S.I. No. 600 of 2001) and conforms to the relevant requirements as specified therein.

The following guidelines were referred to while preparing this appraisal:

- Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (Environmental Protection Agency (EPA) (EPA 2022)
- Advice Notes on Current Practice in the Preparation of Environmental Impact Statements (EPA 2003) (and revised advice notes (EPA 2015b)
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (Department of Housing, Planning and Local Government 2018); and

- Environmental Impact Assessment of Projects, Guidance on the preparation of the Environmental Impact Assessment Report (European Commission 2017)
- Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03, 2020)
- Code of Practice for Water Infrastructure (IW-CDS-5020-03, 2020)
- Recommendations for Site Development Works for Housing Areas, 1998

13.4.2 Site Surveys/Investigation

The scope of the investigation consists of a desk study, surveys and correspondence with utility providers. An ITM-coordinated detailed topographical survey was carried out by Land Surveys and a GPR Utility survey carried out by Scantech Geoscience both provided by the Developer.

In addition, site investigation of ground conditions was carried out under TOBIN's instruction by IGSL. These surveys are the basis for design of services for the scheme.

13.4.3 Consultation

Water Services information (surface water drainage, foul water drainage and watermains supply) was received from Irish Water and Westmeath County Council.

Morley Walsh reviewed the existing utilities (i.e., ESB, Gas & Telecoms) in the vicinity of the site to identify the serving of the development from same and any potential impacts of existing infrastructure. They also engaged with local engineers from Gas Networks Ireland and ESB to ascertain this information and access existing records in the vicinity of the development.

Mapping, where provided by these organisations, was overlaid with the project mapping and assessed.

13.5 Difficulties Encountered

While the information received was readily available, much of the mapping was drawn from GIS data that is known to have an 'indicative only' status. It is deemed suitable for planning purposes but requires ground-truthing for detailed design.

13.6 Baseline Environment

The proposed development consists of what is referred to as the 'current phase' of a broader development circa 394 no. residential units (all phases combined) and is located to the south of the C-Link Road. The phase north of the C-Link Road is referred to as Phase 3. While Phase 3 does not form part of the current planning application, it is a dominant component of the immediate environment within which the current phase is located, particularly in respect of utilities and services.

Also proposed is the provision of public realm landscaping including shared public open space and play areas, public lighting, resident car and bicycle parking, pedestrian and vehicular links throughout the development and cycle lane on the R394.

Vehicular access to the proposed development will be via the existing roundabout at the site boundary from the R394. The proposed access road width is 5.5m with 2m wide footpaths on both sides providing pedestrian access to the development. All internal roads have been designed in accordance with the requirements of Design Manual for Urban Roads and Streets and the Recommendations for Site Development Works for Housing Areas.

As part of this application, an additional pedestrian-only access will be provided at the western boundary of the site at the junction of the C-link road and Ashe Road. A segregated pedestrian/bicycle entrance will also be provided from Ashe Road at the southeast of the site. These access points will increase pedestrian and bicycle permeability through the proposed development.

A 150mm ø watermain connection from the existing 400mm ø watermain which runs along the R394 is proposed for the development. The 150mm ø watermain will run parallel to the main arterial road with 100m ø branches servicing the dwellings on the link streets. An existing 225mm diameter foul sewer runs within the site along the southern site boundary. It is proposed that wastewater generated from the proposed developments will discharge to this sewer via a gravity sewer. Due to site topography and constraints, it is proposed to provide a wastewater pumping station within the site to raise the wastewater generated by some dwellings prior to discharge to the onsite gravity network. This pumpstation has been included in the Phase 3 planning grant. The design thereof, however, allowed for the servicing of flows from Phase 3 as well as from the current phase.

13.6.1 Wastewater Drainage

There are no records or evidence of any foul water infrastructure within the proposed site. It is proposed to discharge the foul flow from the site to the existing external infrastructure. The proposed foul network has been designed in accordance with the Irish Water Specification and a Statement of Design Acceptance will be sought from Irish Water.

13.6.2 Surface Water Drainage

There is limited existing surface water control on the existing site. There is no piped surface water network and existing storm water controls are limited to the heads of land drains constructed as part of the Brosna Arterial Drainage Scheme under the 1945 Arterial Drainage Act (occurring largely in Phase 3). However, during site inspections, these drains were found to be dry and were presumably originally only precautionary in nature.

It is evident that existing rainwater drainage from the site is by means of direct infiltration and percolation into the existing agricultural ground. The local groundwater flow direction is likely to mirror the site topography and catchment drainage. It is proposed to discharge surface water from the site to the existing surface water drainage infrastructure. The current site will be divided into a number of catchment areas and each area will be attenuated to reflect the greenfield run-off rate.

13.6.3 Watermain Network

There is an existing pipeline on the adjacent roads of 100mm uPVC located on the Ashe Road, and a 400mm Asbestos pipeline on the R394 both of which are owned and controlled by Irish Water.

Uisce Eireann have provided a Confirmation of Feasibility for the current phase confirming that a connection is feasible to the 400mm Asbestos pipeline to supply the water demand for the development.

13.6.4 Electricity Supply

There are existing power lines running along the eastern boundary of the site, this development proposes to underground the power line. There is a 10kV line running from south to north through the site that will also need to be undergrounded. It is proposed to provide 2 no. 125mm ESB red band ducts to location of existing poles to be jointed and diverted to run underground.

There will be new substations constructed on site to cater for the new development load. The proposed substations will provide power to several mini pillars which will provide power to the residential dwellings. Each mini pillar will serve a maximum of 8 no. dwellings and will be fed via a LV network ducted in accordance with ESB specifications for underground services.

All of the proposed residential units will be served by electric air-to-water heat pumps due to the requirement to meet Part L of the Building Regulations, of which L1 states that '*a building shall be designed and constructed so as to ensure that the energy performance of the building is such as to limit the amount of energy required for the operation of the building and the amount of carbon dioxide (CO2) emissions associated with this energy use insofar as is reasonably practicable*'. Heat pumps run at an energy efficiency of approximately 400% by which they are considered a renewable form of energy. All heat pumps will comprise invertor technology to reduce start up current and peak loading on the electrical network.

13.6.5 Natural Gas

There is no existing gas main at the site laid and it is not proposed to connect the development to natural gas infrastructure.

13.6.6 Telecoms / Communications

Telecoms ducting and cables will be laid within the development site during the construction stage. Prior to the operational phase of the development this internal network will be connected to the local infrastructure of one or more of the telecoms providers in the area.

A minimum of 2 ducted networks will be provided to allow for choice and competition for the end user. The underground network will consist of 110mm HDPE duct work connecting JB4 manholes with each JB4 manhole serving up to 8 dwellings.

- Possible Effect: Trench excavations will be relatively shallow and temporary, although extensive about the site. The main risk will be from surface water runoff from bare soil and soil storage areas during construction works. Construction activities can result in the release of suspended solids to local drainage features and can result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Surface waters are expected to stay within the site boundary and percolate through the soil/subsoil.

- Significance of impact: Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work. Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered. Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses and only in lengths that can be safely closed within the same working shift. The impact is therefore imperceptible.

13.6.7 Road Network

The proposed development can be accessed from the R394 Road and the Ashe Road. The access to the site is situated within a 50km/h urban speed zone. The R394 has a width of approximately 8.0m in the vicinity of the access to the development site. The R394 also provides a 2m wide raised footpath either side of the road.

13.6.8 Waste

The site is a greenfield with no waste facilities. There are currently waste collectors collecting the waste from the dwellings north of the development and it is anticipated that during the operational phase a similar plan will be in place.

13.7 Characteristics of Proposed Development

The proposed project is described in detail in Chapter 2 'Project Description'.

13.7.1 Proposed Wastewater Drainage

The two foul sewer networks across Phase 3 and the current phase are required to convey wastewater generated from the proposed development to existing external wastewater mains on the south and to the north of the site. The proposed foul sewer networks are presented on drawings:

- Proposed Drainage Layout Sheet 1 of 2 - (10906-2503),
- Proposed Drainage Layout Sheet 2 of 2 – (10906-2504)
- Proposed Rising Main and Storm Culvert Connection – (10906-2505)
- Standard Manhole Details Sheet 1 of 2 – (10906-2519)
- Standard Manhole Details Sheet 2 of 2 – (10906-2520)
- Standard Pipe Bedding Details – (10906-2521)
- Typical Site Work Details – (10906-2523)
- Proposed Foul Manhole & Drainage Schedule – (10906-2525)

(Phase 3 construction layouts have been designed by JOR Consulting Civil & Structural Engineers, subject to the planning grant approvals.)

In general, the northern half of the site gravitates to a wastewater pumping station located to the north of the current phase of the development. The pumping station has been designed to cater for circa. 181 units (including a crèche) from ex. Phase 1, ex. Phase 2 (equivalent to the current phase)

and Phase 3. Of these, 82 units are from the current phase. From here the wastewater will be pumped through a 100mm ø rising main to a discharge manhole located at north of the development along the C-Link Road from whence it gravitates to an existing Irish Water-owned gravity network. The remainder of units in the current phase gravitate to an existing 225mm ø gravity foul sewer main running along Ashe Road.

The pipework for the wastewater drainage system has been designed to provide for six times the dry weather flow for the combined phases in accordance with the Irish Water Code of practice and standard details. The proposed foul sewer networks have been designed using MicroDrainage 2018.1.1 and Causeway Flow modelling software. The results and outputs from the modelling can be found in the Civil Design Reports for each of the three phases.

- Possible Effect: Release of effluent from wastewater systems has the potential to contaminate groundwater and surface water.
- Significance of impact: Under the normal operation of the wastewater system, the impact on surface water or groundwater quality is imperceptible.

13.7.2 Proposed Surface Water Drainage

The proposed storm water drainage system has been designed to cater for all surface water runoff from all hard surfaces within the proposed development including roadways, roofs, parking areas etc. All stormwater generated on site will flow by gravity through a Petrol Interceptor to remove any hydrocarbons present. The separators have been sized to cater for the impermeable areas, i.e., roads, car parking and footpath areas of the site for which they have been designed. The current phase (east of the R394) and, as part of the planning grant, the northern-most storm sewer network in Phase 3 (west of R394) discharge to an existing 750mm concrete storm sewer along the R394. The remainder of Phase 3 discharges into an infiltration basin adjacent the Phase 3 access point, from whence an overflow outfall ties into the same 750mm concrete storm sewer located along the R394.

It is proposed to install the stormwater attenuation pond on site to allow for a controlled discharge northeast to the proposed overflow network. The combined discharge rate shall not exceed the greenfield runoff rate of 2 l/s/ha. The storm water drainage design has been undertaken using MicroDrainage and Causeway Flow modelling software. The analysis considered the 100-year return period plus an additional 20% to account for the effects of climate change.

The detention swales are proposed within the green areas above attenuation tanks to provide an emergency overflow relief mechanism and a local amenity to residents that is aesthetically pleasing.

The maximum and minimum stormwater pipe gradients will be between 1/30 and 1/300. All velocities at said gradients will fall within the limits of 0.75m/sec and 3m/sec as set out in “Recommendations for Site Development Works” as published by the Department of Environment.

- Possible Effect: Replacement of the greenfield surface with hardstand surfaces will result in an increased risk of pluvial flooding due to low permeability surfaces which will inhibit any downward percolation of rainwater. All surface water arising on site will drain to a stormwater attenuation tank and pond/bioswale at a controlled rate.

- Significance of impact: The risk of pluvial flooding is minimised by the drainage network set-up, controlled discharge rate as per the greenfield runoff-rate, gullies strategically located and the use of the retention pond for surface water storage. Designed run-off equates to that of the calculated greenfields value. The impact, therefore, is slight to imperceptible.

- Possible Effect: Release of pollutants and hydrocarbons from surface water runoff on impermeable areas.
- Significance of impact: The risk of hydrocarbons and pollutants entering the natural watercourse is eliminated by the introduction of a petrol/oil interceptor prior to discharging to the attenuation tank and pond/bioswale. The impact is therefore classed as imperceptible.

13.7.3 Proposed Watermain Network

The watermain layout has been designed in accordance with Irish Water Code of Practice for Watermain Infrastructure IW-CDS-5020-03. The water supply required for the proposed development shall be delivered via a 150mm ø spine watermain as per Irish Water requirements laid parallel to the main arterial street.

Current Phase: This phase contains a 150mm spine. It is proposed to connect the 150mm ø main spine to the 400mm asbestos watermain on the C-Link Road (R394), north-west of the proposed site (current phase) entrance.

The 100mm ø PE watermain branches from this spine main will service dwellings on link streets within the development.

- Possible Effect: Excavations will be relatively shallow and temporary. The main risk will be from surface water runoff from bare soil and soil storage areas during construction works. Construction activities can result in the release of suspended solids to local drainage features and can result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Surface waters are expected to stay within the site boundary and percolate through the soil/subsoil.
- Significance of impact: Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work. Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered. Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses. The impact is therefore slight to imperceptible.

13.7.4 Electricity Overview

New electricity services infrastructure will be put in place to serve the proposed housing development. This will consist of a ducted underground network comprising 125mm ESB red band ducts from each sub-station laid in circuits to individual mini pillars. Each mini pillar will serve up to 8 dwellings via a ducted 50mm underground house service connection. Final design is subject to ESB confirmation. All

installations to be carried out in accordance with IS10101 and ESB Code of Practice. Trench and duct installation in relation to the ESB Scope of Works to be carried out in accordance with ESB Networks Technical Guidance Document Current Edition Code of Practice. Prior to back filling and making good ESB Trench the contractor shall request ESB attendance to site to review and approve ducting provision.

- Possible Effect: Trench excavations will be relatively shallow and temporary, although extensive about the site. The main risk will be from surface water runoff from bare soil and soil storage areas during construction works. Construction activities can result in the release of suspended solids to local drainage features and can result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Surface waters are expected to stay within the site boundary and percolate through the soil/subsoil.
- Significance of impact: Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work. Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered. Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses and only in lengths that can be safely closed within the same working shift. The impact is therefore imperceptible.

- Possible Effect: Risk of interruption to existing services as a result of faults or after during installation as a result of poor workmanship, materials, design or extraneous influences.
- Stringent quality controls govern the design, materials fabrication and installation of this infrastructure. Causes of faults are therefore significantly limited to extraneous factors. The risk is therefore low, while the impact is moderate to high, but this is limited to the case of faults being caused by, and coinciding with, severe storm events.

13.7.5 Natural Gas Overview

The proposed project will not require any gas connections. Neither is there any existing gas infrastructure within the vicinity of the proposed development.

13.7.6 Telecoms Overview

New telecom services infrastructure will be put in place to serve the housing development. Trench and duct installation in relation to the Eir/Virgin scope of Works to be carried out in accordance with Eir & Virgin design guidelines (current edition). Prior to back filling and making good Eir/Virgin trench the contractor shall request utility provider attendance to site to review and approve ducting provision.

- Possible Effect: Trench excavations will be relatively shallow and temporary, although extensive about the site. The main risk will be from surface water runoff from bare soil and soil storage areas during construction works. Construction activities can result in the release of suspended solids to local drainage features and can result in an increase in the

suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Surface waters are expected to stay within the site boundary and percolate through the soil/subsoil.

- Significance of impact: Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work. Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered. Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses and only in lengths that can be safely closed within the same working shift. The impact is therefore imperceptible.

13.7.7 Road Network

All internal roads have been designed in accordance with the requirements of Design Manual for Urban Roads and Streets and the Recommendations for Site Development Works for Housing Areas. Autotrack vehicle swept path analysis has been completed for the proposed site layout for Large Car and Refuse Truck and Fire Tender to ensure the vehicles can safely manoeuvre around the site.

Road levels for the site will be proposed taking cognisance of the existing topography and ground conditions. All roads shall be constructed on a suitable bearing with a road construction makeup as per detail shown on drawings 10906-2506, 2507 & 2523. All roads will include a 1:40 camber from the centre of the road and longitudinal gradients of road sections lie between 1:21 and 1:200 to ensure adequate surface water drainage is achieved.

Lockable road gullies will be located, at a minimum, every 200m² with local low points allowing for double gullies as per Recommendations for Site Development Works for Housing Areas to ensure surface water drainage will not be blocked.

The use of shared surfaces raised junction and pedestrian crossing points along with strategically positioned drop kerbs and tactile paving will allow for full linkage for visually impaired and less-able pedestrians while also prioritising pedestrian movements over vehicular movements.

The vehicular access to the site will be off the existing formed entrance to the roundabout on the C-Link Road. Pedestrian and bicycle access to the proposed development will be provided adjacent to the vehicular access from the R394 roundabout and via a purpose-built pedestrian/cycleway from Ashe Road.

- Possible Effect: Excavations will be relatively shallow and temporary, although extensive about the site. The main risk will be from surface water runoff from bare soil and soil storage areas during construction works. Construction activities can result in the release of suspended solids to local drainage features and can result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Surface waters are expected to stay within the site boundary and percolate through the soil/subsoil.

- Significance of impact: Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work. Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered. Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses. The impact is therefore slight to imperceptible.

13.7.8 Existing Properties

The site of the proposed development (current phase) is a 5.95 Ha. There are residential receptors within 100m of the proposed development site. The closest receptors are on the R394 to the northeast of the site.

- Possible Effect: Construction noise or dust being carried to neighbouring properties.
- Significance of impact: Site management will include numerous safe-working and environmental-welfare procedures (including dust-suppression) which will be monitored and enforced by various mechanisms. Construction noise will be periodic, generated only for the minimum period required and only during working hours. The impact is therefore slight.

13.7.9 Waste

The site is a greenfield with no waste facilities. There are currently waste collectors collecting the waste from the dwellings located to the south and west of the proposed development and it is anticipated that during the operational phase a similar plan will be in place.

- Possible Effect: Construction packaging has the potential to become airborne or waterborne, and could, without the adequate controls during construction, find their way into watercourses causing pollution and impediments to natural surface water flow, or into neighbouring properties.
- Significance of impact: Management, containment and handling of construction waste will be undertaken during construction work strictly in accordance with the Construction Environmental Management Plan. The impact is therefore slight to imperceptible.

- Possible Effect: Domestic waste has the potential to become airborne or waterborne, or present a health risk commonly associated with exposure.
- Significance of impact: Management, containment and handling of domestic waste will be undertaken in accordance with the existing services already offered to adjacent residential development. The impact is therefore slight to imperceptible.

- Possible Effect: Contaminated backfill of service trenches can cause instability to service lines.
- Significance of impact: Management, containment and handling of construction waste will be undertaken during construction work strictly in accordance with the Construction Environmental Management Plan. A waste sampling strategy is to be employed by the

Contractor to ensure all backfill material is inert. The impact is therefore slight to imperceptible.

13.7.10 Estimated Earthwork Volumes

Removal of the existing topsoil layer will be required. It is expected that all stripped topsoil will be reused on site. Estimated volumes have been stated elsewhere in this EIAR. It is noted that earthworks calculations are this stage of design are high-level estimations and that a full cut and fill exercise would be needed to establish exact volumes.

A construction waste management plan has been prepared and forms part of this application as a separate document. Soil and stones typically make up a significant proportion of construction waste. It is anticipated that the majority of excavation wastes will be re-used on site for landscaping and site restoration purposes. Any bedrock excavated shall be tested and if suitable re-used as fill under roads and footpaths.

- Possible Effect: Excavations will be relatively shallow and temporary, although extensive about the site. The main risk will be from surface water runoff from bare soil and soil storage areas during construction works. Construction activities can result in the release of suspended solids to local drainage features and can result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Surface waters are expected to stay within the site boundary and percolate through the soil/subsoil.
- Significance of impact: Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work. Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered. Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses. The impact is therefore slight to imperceptible.

13.8 The 'Do nothing' Scenario

The "Do Nothing" scenario refers to what would happen if the proposed development was not implemented. In this scenario, the effects described in this chapter would not arise and for this reason the 'do-nothing' scenario is considered to have a neutral effect with regards to utilities. The 'do-nothing' scenario is therefore not addressed further in this chapter.

As with the above, all utility companies have indicated that there is no intention to undertake network improvements in the vicinity other than standard maintenance or repairs if the development is not pursued.

13.9 Potential Significant Effects

13.9.1 Construction Phase

Wastewater contamination of groundwater and surface water:

- Possible Effect: Release of effluent from wastewater systems has the potential to contaminate groundwater and surface water.

Increased risk of pluvial flooding:

- Possible Effect: Replacement of the greenfield surface with hardstand surfaces will result in an increased risk of pluvial flooding due to low permeability surfaces which will inhibit any downward percolation of rainwater. All surface water arising on site will drain to a stormwater attenuation tank and pond/bioswale at a controlled rate.

Hydrocarbon pollution:

- Possible Effect: Release of pollutants and hydrocarbons from surface water runoff on impermeable areas.

Excavation-related silt migration:

- Possible Effect: Excavations (bulk or trench) will be relatively shallow and temporary, although extensive about the site. The main risk will be from surface water runoff from bare soil and soil storage areas during construction works. Construction activities can result in the release of suspended solids to local drainage features and can result in an increase in the suspended sediment load, resulting in increased turbidity which in turn could affect the water quality and fish stocks of downstream water bodies. Surface waters are expected to stay within the site boundary and percolate through the soil/subsoil.

Construction waste dispersal:

- Possible Effect: Construction packaging has the potential to become airborne or waterborne, and could, without the adequate controls during construction, find their way into watercourses causing pollution and impediments to natural surface water flow, or into neighbouring properties.
- Possible Effect: Contaminated backfill of service trenches can cause instability to service lines.

Electrical faults:

- Possible Effect: Risk of interruption to existing services as a result of faults or after during installation as a result of poor workmanship, materials, design or extraneous influences.

Dust/noise:

- Possible Effect: Construction noise or dust being carried to neighbouring properties.

13.9.2 Operational Phase

Domestic waste dispersal:

- Possible Effect: Domestic waste has the potential to become airborne or waterborne, or present a health risk commonly associated with exposure.

Electrical faults:

- Possible Effect: Risk of interruption to existing services as a result of faults or after during installation as a result of poor workmanship, materials, design or extraneous influences.

13.9.3 Cumulative Effects

None of the construction Phase effects are cumulative. (This includes the cumulative effect of Phase 3.)

Cumulative operational effects are limited to those associated with domestic waste.

13.10 Mitigation

13.10.1 Construction Phase Mitigation

Wastewater contamination of groundwater and surface water:

- Significance of impact without mitigation: Under the normal operation of the wastewater system, the impact on surface water or groundwater quality is imperceptible.
- Significance of impact with mitigation: None required.

Increased risk of pluvial flooding:

- Significance of impact without mitigation: Short term but potentially severe.
- Significance of impact with mitigation: The risk of pluvial flooding is minimised by the drainage network set-up, controlled discharge rate as per the greenfield runoff-rate, gullies strategically located and the use of the retention pond for surface water storage. Designed run-off equates to that of the calculated greenfields value. The impact, therefore, is slight to imperceptible.

Hydrocarbon pollution:

- Significance of impact without mitigation: Ongoing and moderate to severe.
- Significance of impact with mitigation: The risk of hydrocarbons and pollutants entering the natural watercourse is eliminated by the introduction of a petrol/oil interceptor prior to discharging to the attenuation tank and pond/bioswale. The impact is therefore classed as imperceptible.

Excavation-related silt migration:

- Significance of impact without mitigation: Short term and slight.

- Significance of impact with mitigation: Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work. Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered. Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses. The impact is thereby mitigated slight to imperceptible levels.

Construction waste dispersal:

- Significance of impact without mitigation: Temporary but moderate to severe.
- Significance of impact with mitigation: Management, containment and handling of construction waste will be undertaken during construction work strictly in accordance with the Construction Environmental Management Plan. In the case of backfill material, a waste sampling strategy is to be employed by the Contractor to ensure all backfill material is inert. The impact is thereby mitigated slight to imperceptible levels.

Electrical faults:

- Significance of impact without mitigation: Temporary but moderate to severe.
- Significance of impact with mitigation: Stringent quality controls govern the design, materials fabrication and installation of this infrastructure. Causes of faults are therefore significantly limited to extraneous factors. The risk is therefore low, while the impact is moderate to high in the case of faults being caused by and coinciding with severe storm events.

Dust/Noise experienced by neighbours:

- Significance of impact without mitigation: Temporary and moderate.
- Significance of impact with mitigation: Site management will include numerous safe-working and environmental-welfare procedures (including dust-suppression) which will be monitored and enforced by various mechanisms. Construction noise will be periodic, generated only for the minimum period required and only during working hours.

13.10.2 Operational Phase Mitigation

Domestic waste dispersal:

- Significance of impact without mitigation: Ongoing and moderate to severe.
- Significance of impact with mitigation: Management, containment and handling of domestic waste will be undertaken strictly in accordance with the Operational Environmental Management Plan. The impact is thereby mitigated slight to imperceptible levels.

Electrical faults:

- Significance of impact without mitigation: Temporary but moderate to severe.

- Significance of impact with mitigation: Stringent quality controls govern the design, materials fabrication and installation of this infrastructure. Causes of faults are therefore significantly limited to extraneous factors. The risk is therefore low, while the impact is moderate to high, but this is limited to the case of faults being caused by, and coinciding with, severe storm events.

13.10.3 Cumulative Mitigation

The only identified negative Significant Cumulative Effect is that associated with poorly managed domestic waste during the operational stage. This is somewhat self-regulating, in that the effect thereof is felt by the residents who will necessarily have management structures in place to address these issues. This effect is also addressed by national and local regulations, thereby providing a ready mechanism for enforcement of necessary mitigation measures.

13.11 Residual Impact Assessment

13.11.1 Construction Phase

The construction stage of the proposed development will comprise of site clearance and preparation, excavation and the construction of the proposed development. The potential impacts associated with the construction stage of the proposed development on material assets are likely to be temporary and will cause minor/short term disturbance. Provided mitigation measures are adhered to as part of this development, there is unlikely to be any adverse impacts on material assets during the construction stage and any residual impacts on the existing foul and waste systems would be temporary and slight.

13.11.2 Operational Phase

The proposed development will have a positive impact on the surrounding environment by providing much needed housing in the area and meeting the needs of the growth population.

The loading in the wastewater and watermains from the proposed development will be adequately accommodated in the foul and watermain network. Upgrade works to the nearby wastewater treatment plant will be beneficial to developments in the surrounding area.

In compliance with the SUDS manual the runoff from the development will mimic the existing greenfield run off and hence have no impact in the surrounding network. Improved controls on the surface water along with silt management and/or silt traps the proposed development will result in an improvement in the quantity and quality of discharge off site.

13.11.3 Cumulative Impact

The only identified negative Significant Cumulative Effect is that associated with poorly managed domestic waste during the operational stage. This is somewhat self-regulating, in that the effect thereof is felt by the residents who will necessarily have management structures in place to address these issues. This effect is also addressed by national and local regulations, thereby providing a ready

mechanism for enforcement of necessary mitigation measures. Therefore, the residual impact following implementation of mitigation measures is long-term but imperceptible to slight.

13.12 Risk of Major Accidents or Disasters

13.12.1 Electrical

The presence of the ESB substation and the high voltage lines present a risk of high impact but, considering the stringent regulations and codes of practice governing the installation and operation of these utilities, offer a low likelihood of occurrence. The risk of a major accident is therefore considered moderate, subject to the observation of these mitigating factors.

13.12.2 Wastewater Spillage

The presence of the proposed wastewater pumpstation constitutes a risk of moderate impact but, considering the standards to which this pumpstation would be required to be constructed and managed (being those of Irish Water), the likelihood of occurrence is low. The risk of a major accident is therefore considered low, subject to the observation of these mitigating factors.

13.13 Significant Interactions

13.13.1 Population & Human Health

Construction Phase: Weak negative interaction with adjacent population due to disruption of services during construction.

Operational Phase: Strong positive interaction with adjacent and occupant population with the provision and upgrade of services and service links.

13.13.2 Soils & Geology

Construction Phase: Weak neutral interaction due to earthworks operations during construction.

Operational Phase: No interaction.

13.13.3 Hydrology & Hydrogeology

Construction Phase: Weak negative interaction with increased potential for accelerated run-off, silt loading of surface water, and possible disruption of groundwater flows during construction.

Operational Phase: Weak neutral interaction with disruption of natural surface flows limited to the extends of the site.

13.13.4 Air Quality & Climate Change

Construction Phase: Weak negative interaction with potential for increased rainfall to disrupt construction activities.

Operational Phase: No interaction.

13.13.5 Noise & Vibration

Construction Phase: Some negative interaction due to earthworks and construction activities generating noise and vibration during construction.

Operational Phase: No interaction.

13.13.6 Landscape & Visual Impact

Construction Phase: Weak negative interaction with temporary unsightliness of construction activities during construction.

Operational Phase: Strong positive interaction from aspects of landscaping forming part of the stormwater controls.

13.13.7 Material Assets: Traffic & Transport

Construction Phase: Some negative interaction with disruption of service roads due to increased construction traffic and the laying of services across roadways requiring temporary and partial closure of lanes during construction.

Operational Phase: No interaction.

13.13.8 Biodiversity

Construction Phase: Some negative interaction with transformation of the site from the current usage.

Operational Phase: Potential weak negative interaction with transformation of the site from the current usage. It is noted, however, that the aims of the proposed landscaping would, in part, address the rehabilitation of the site to an environmentally desirable state. Comments listed here are subject to these efforts.

13.13.9 Cultural Heritage & Archaeology

Construction Phase: No interaction.

Operational Phase: No interaction.

(These comments are based on findings of earlier site assessments that rule out the presence of culturally or archeologically significant artifacts.)

13.14 References & Sources

- Environmental Protection Agency (EPA) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (2022).
- Code of Practice for Water Infrastructure (IW-CDS-5020-03), July 2020 (Revision 2), Irish Water.
- Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03), July 2020 (Revision 2), Irish Water.
- Design Manual for Urban Roads and Streets (DMURS), Department of Transport, Tourism & Sport / Department of Housing, Planning & Local Government, Government of Ireland.
- CIRIA SuDS Manual 2015.

13.15 Appendix

- Civil Design Report
- Preliminary Construction Environmental Management Plan
- Outline Construction Traffic Management Plan
- Construction Demolition & Operational Waste Management Plan
- Civil engineering layouts and details

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 14

Biodiversity

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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14 Biodiversity

14.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on the biodiversity of the lands at Rathgowan, Mullingar, Co. Westmeath, hereafter referred to as the 'Proposed Development' or 'Site' when referring to the site area of the Proposed Development, and surrounding environs, with emphasis on habitats, flora and fauna, and details the methodology of assessment used in each case. It 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 conservation importance; and proposes measures for the mitigation of these impacts, where appropriate. A description of residual effects that will remain following the implementation of mitigation is also outlined in this Chapter.

The Chapter has been completed having regard to the *Guidelines for Ecological Impact Assessment in the UK and Ireland*, by the Chartered Institute of Ecology and Environmental Management (CIEEM, 2018), together with the guidance outlined in the Environmental Protection Agency (EPA) documents *Guidelines on the Information to be Contained in Environmental Impact Assessment Reports* (May 2022) and *Advice Notes for Preparing Environmental Impact Statements* (Draft, September 2015). The value of the ecological resources, the habitats, and species present or potentially present, was determined using the ecological evaluation guidance given in the National Roads Authority's (NRA, now Transport Infrastructure Ireland) *Ecological Assessment Guidelines* (NRA, 2009).

14.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Rozalyn O'Hora, Project Ecologist with Enviroguide Consulting.

Rozalyn holds a M.Sc. (Hons) in Ecological Assessment from University College Cork and a B.Sc. (Hons) in Environmental Science from the University of Galway. ROH has a wealth of experience in desktop research, literature scoping review and report writing as well as practical field experience (habitat surveys, bat surveys, invasive species surveys, badger surveys and bird surveys). ROH has extensive experience in compiling Ecological Impact Assessments (EcIA), Stage I and Stage II Appropriate Assessment (AA) Reports and in the overall assessment of potential impacts to ecological receptors from a range of developments.

14.3 Proposed Development

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

14.3.1 Aspects Relevant to this Assessment

The Construction Phase of the Proposed Development will require the removal of the majority of habitats at the Site and the addition of landscaped areas. This type of work has the potential to result in effects on biodiversity.

14.4 Methodology

14.4.1 Relevant Legislation & Guidance

14.4.1.1 Wildlife Act (1976) (as amended)

The Wildlife Act 1976 (as amended) was enacted to provide protection to birds, animals, and plants in Ireland and to control activities which may have an adverse impact on the conservation of wildlife. With regard to the listed species, it is an offence to disturb, injure or damage their breeding or resting place wherever these occur without an appropriate licence from the National Parks and Wildlife Service (NPWS). This list includes all birds along with their nests and eggs. Intentional destruction of an active nest from the building stage up until the chicks have fledged is an offence. This includes the cutting of hedgerows from the 1st of March to the 31st of August. The act also provides a mechanism to give statutory protection to Natural Heritage Areas (NHAs). The Wildlife Amendment Act 2000 widened the scope of the Act to include most species, including the majority of fish and aquatic invertebrate species which were excluded from the 1976 Act.

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 from the date they are formerly proposed for designation, under the Wildlife Amendment Act (2000).

14.4.1.2 EU Habitats Directive 1992 and EC (Birds and Natural Habitats) Regulations 2011

The Habitats Directive (92/43/EEC) seeks to conserve natural habitats and wild fauna and flora by the designation of SACs and the Birds Directive 79/409/EEC) seeks to protect birds of special importance by the designation SPAs. It is the responsibility of each member state to designate SPAs and SACs, both of which will form part of Natura 2000, a network of protected sites throughout the European Community. SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and other regularly occurring migratory birds and their habitats. The annexed habitats and species for which each site is selected correspond to the Qualifying Interests (QIs) of the sites; from these the conservation objectives of the site are derived.

Annex IV of the EU Habitats Directive provides protection to a number of listed species, wherever they occur. Under Regulation 23 of the Habitats Directive, any person who, in regard to the listed species, "*Deliberately captures or kills any specimen of these species in the wild, deliberately disturbs these species particularly during the period of breeding, rearing, hibernation and migration, deliberately*

takes or destroys eggs from the wild or damages or destroys a breeding site or resting place of such an animal shall be guilty of an offence."

In view of their sensitive status across Europe, all species of bat have been listed on Annex IV of the EC 'Habitats Directive and some, such as the lesser horseshoe bat, are given further protection and listed on Annex II of this Directive. The obligations of the Habitats Directive have been transposed into Irish law and. combined with the Wildlife Acts 1976 to 2018, ensure that individual bats and their breeding sites and resting places are fully protected. This has important implications for those who own or manage sites where bats occur.

14.4.1.3 Flora (Protection) Order, 2022

The Flora (Protection) Order affords protection to several species of plant in Ireland, including 89 vascular plants, 40 mosses, 25 liverworts, 2 stoneworts and 1 lichen. This Act makes it illegal for anyone to uproot, cut or damage any of the listed plant species and it also forbids anyone from altering, interfering, or damaging their habitats. This protection is not confined to within designated conservation sites and applies wherever the plants are found.

14.4.1.4 EU Birds Directive

The Birds Directive constitutes a level of general protection for all wild birds throughout the European Union. Annex I of the Birds Directive includes a total of 194 bird species that are considered rare, vulnerable to habitat changes or in danger of extinction within the European Union. Article 4 establishes that there should be a sustainable management of hunting of listed species, and that any large scale non-selective killing of birds must be outlawed. The Directive requires the designation of SPAs for: listed and rare species, regularly occurring migratory species and for wetlands which attract large numbers of birds. There are 25 Annex I species that regularly occur in Ireland and a total of 165 Special Protection Areas have been designated.

14.4.1.5 Habitats Directive

The Habitats Directive aims to protect some 220 habitats and approximately 1,000 species throughout Europe. The habitats and species are listed in the Directives annexes, where Annex I covers habitats and Annex II, IV and V cover species. There are 59 Annex I habitats in Ireland and 33 Annex IV species which require strict protection wherever they occur. The Directive requires the designation of SACs for areas of habitat deemed to be of European interest. The SACs together with the SPAs from the Birds Directive form a network of protected sites called Natura 2000.

14.4.1.6 Water Framework Directive

The EU Water Framework Directive (WFD) 2000/60/EC is an important piece of environmental legislation which aims to protect and improve water quality. It applies to rivers, lakes, groundwater, estuaries, and coastal waters. The Water Framework Directive was agreed by all individual EU member states in 2000, and its first cycle ran from 2009 – 2015. The Directive runs in 6-year cycles, the second cycle ran from 2016 – 2021 and the current (third) cycle runs from 2022 - 2027. The aim of the WFD is to prevent any deterioration in the existing status of water quality, including the protection of good and high-water quality status where it exists. The WFD requires member states to manage their water

resources on an integrated basis to achieve at least 'good' ecological status, through River Basin Management Plans (RBMP), by 2027.

14.4.1.7 Bern and Bonn Convention

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention 1982) was enacted to conserve all species and their habitats. The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983) was introduced to give protection to migratory species across borders in Europe.

14.4.1.8 Ramsar Convention

The Ramsar Convention on Wetlands is an intergovernmental treaty signed in Ramsar, Iran, in 1971. The treaty is a commitment for national action and international cooperation for the conservation of wetlands and their resources. In Ireland there are currently 45 Ramsar sites which cover a total area of 66,994 Ha.

14.4.1.9 Westmeath County Development Plan

Objectives of the Westmeath County Development Plan 2021 – 2027 that are of relevance to this chapter are outlined below:

CPO 12.24 states:

It is a policy objective of Westmeath County Council to: *Protect and where possible enhance biodiversity and ecological connectivity, including woodlands, trees, hedgerows, semi-natural grasslands, rivers, streams, natural springs, wetlands, geological and geo-morphological systems, other landscape features, natural lighting conditions, and associated wildlife where these form part of the ecological network and/or may be considered as ecological corridors or stepping stones in the context of Article 10 of the Habitats Directive. Appropriate mitigation and/or compensation to conserve biodiversity, landscape character and green infrastructure networks will be required where habitats are at risk or lost as part of a development*.

CPO 12.39 states:

It is a policy of Westmeath County Council to: *Discourage the felling of mature trees and hedgerows, particularly species rich roadside and townland boundary hedgerows to facilitate development and seek Tree Management Plans to ensure that trees are adequately protected during development and incorporated into the design of new developments*.

CPO 12.40 states*:*

It is a policy objective of Westmeath County Council to: *Protect and preserve existing hedgerows in new developments, particularly species rich roadside and townland boundary hedgerows, and where their removal is necessary during the course of road works or other works seek their replacement with new hedgerows of native species indigenous to the area*.

CPO 12.58 states:

It is a policy objective of Westmeath County Council to: *Ensure that the County's watercourses are retained for their biodiversity and flood protection values and to conserve and enhance where possible, the wildlife habitats of the County's rivers and riparian zones, lakes, canals and streams which occur outside of designated areas to provide a network of habitats and biodiversity corridors throughout the county*.

CPO 12.60 states:

It is a policy objective of Westmeath County Council to: *Ensure that run off from a proposed development does not result in a deterioration of downstream watercourses or habitats*.

14.4.2 Study Methodology

This section details the steps and methodology employed to undertake the Ecological Impact Assessment (EcIA) of the Site of the Proposed Development.

14.4.2.1 Scope of assessment

The specific objectives of the study were to:

- Undertake baseline ecological surveys of the Site and evaluate the nature conservation importance of the Site;
- Identify and assess the direct, indirect and cumulative ecological implications of impacts of the project during its lifetime;
- Where possible, propose mitigation measures to remove or reduce those impacts at the Design, Construction and Operational Phases; and
- Achieve the best possible biodiversity outcome for the future of the Site.

14.4.2.2 Zone of influence

The 'zone of influence' (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 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. In this instance the ZOI is regarded to be relatively limited and within the red line boundary of the Site for most ecological receptors.

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).*"

Thus, to identify the European sites that potentially lie within the ZOI of the Proposed Development, a Source-Path-Receptor (S-P-R) method was adopted, as described in OPR PN01 (OPR 2021). 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 Screening Reports and EIARs.

The relevant European sites were identified based on the following:

- Identification of potential sources of effects based on the Proposed Development description and details, including changes to potentially suitable ex-situ habitats at the Site (i.e., habitats utilised by SCI bird species outside of their designated SPAs);
- Use of up-to-date GIS spatial datasets for European designated sites and water catchments – downloaded from the NPWS website (*www.npws.ie*) and the EPA website (*www.epa.ie*) to identify European sites which could potentially be affected by the Proposed Development; and
- Identification of potential pathways between the Site of the Proposed Development and any European sites within the ZOI of any of the identified sources of effects.
    - The catchment data were used to establish or discount potential hydrological connectivity between the Proposed Development and any European sites.
    - Groundwater and bedrock information used to establish or discount potential hydrogeological connectivity between the Proposed Development and any European sites.
    - Air and land connectivity assessed based on Proposed Development details and proximity to European sites.
    - Consideration of potential indirect pathways, e.g., impacts to flight paths, *ex-situ* habitats, etc.
- Defining the likely ZOI based on the identified sources of effects and potential pathways between the Proposed Development and any European sites.

14.4.2.3 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/); and
    - Other internationally designated sites e.g., UNESCO Biosphere's.
- Regional development plans to identify any remaining sites or areas designated for nature conservation at a local level.

14.4.3 Site Surveys

A range of field surveys have been carried out at the Site to inform this Biodiversity Chapter. The following sections provide details of the field surveys carried out.

14.4.3.1 Habitat surveying, mapping, and evaluation

A habitat survey of the Site was carried out by Enviroguide Ecologists on the 21st of April 2023 in optimal weather conditions (dry, calm and warm). Habitats were categorised according to the Heritage Council's '*A Guide to Habitats in Ireland*' (Fossitt, 2000) to Level 3. 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. Habitat categories, characteristic plant species and other ecological features and resources were recorded on field sheets. Habitats within the surrounding area of the Site were classified based on views from the Site and satellite imagery where necessary (Google Earth, Digital Globe and OSI).

The habitat and flora surveys were conducted during the appropriate survey period as recommended in both Smith et al. (2011) and NRA (2009).

14.4.3.2 Invasive species survey

The Site was searched for invasive flora on the 21st of April 2023, with a particular focus on those listed on the Third Schedule of SI No. 477/2011, and their location and extent recorded. This included a detailed search for signs or any invasive flora or fauna, with any incidental observations of evidence for invasive species recorded when on Site.

14.4.3.3 Mammal survey

Mammal surveys of the Site were carried out in conjunction with other field surveys. The mammal surveys conducted as part of this assessment had regard to the survey guidelines contained in *Guidelines for the Assessment of Ecological Impacts of National Road schemes* (NRA, 2009). The Site was searched for signs of mammals such as burrows, setts, droppings, foraging signs and tracks as per Bang and Dahlstrom (2001). The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area.

14.4.3.4 Bat survey

14.4.3.4.1 Habitat evaluation and bat landscape suitability

The Site was assessed during daytime walkover surveys on the 21st of April 2023 in relation to potential bat foraging habitat and potential bat commuting routes. Bat habitats and commuting routes identified were considered in relation to the wider landscape to determine landscape connectivity for local bat populations through the examination of aerial photographs. The Bat Conservation Trust (BCT, 2016) guidelines were followed for the assessment rating and classified using Table 4.1 of the same which is recreated in Table 14.1 of this report.

Table 14.1. Guidelines for assessing the potential suitability of proposed development sites for bats, based on the presence of roost features within the landscape, to be applied using professional judgement (BCT, 2016).

Suitability	Description of roosting habitats	Commuting and foraging habitats
Negligible	Negligible roosting features on Site and therefore unlikely to be used by roosting bats.	Negligible habitat features on Site and therefore unlikely to be used by commuting or foraging bats.
Low	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions[1] and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e., unlikely to be suitable for maternity or hibernation[2]).	Habitat that could be used by small numbers of commuting bats such as a gappy hedgerow or unvegetated stream, but isolated, i.e., not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers or foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub.

[1] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

[2] Evidence from the Netherlands shows mass swarming events of common pipistrelle bats in the autumn followed by mass hibernation in a diverse range of building types in urban environments (Korsten et al., 2015). This phenomenon requires some research in the UK but ecologists should be aware of the potential for larger numbers of this species to be present during the autumn and winter in large buildings in highly urbanised environments.

Suitability	Description of roosting habitats	Commuting and foraging habitats
	A tree of sufficient size and age to contain potential roost features (PRFs) but with none seen from the ground or features seen with only limited roosting potential[3].	
Moderate	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions[1]. and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).	Continuous habitat connected to the wider landscape that could be used by bats for commuting such as lines of trees and scrub of linked back gardens. Habitat that is connected to the wider landscape that could be used by bats for foraging such as trees, scrub, grassland or water.
High	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions[1] and surrounding habitat	Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by commuting bats such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree lined watercourses and grazed parkland. Site is close to and connected to known roosts.

The National Biodiversity Data Centre (NBDC) online map viewer includes an interactive layer which displays geographical areas in terms of a 'habitat suitability' index for bats. The bat suitability index ranges from 0 to 100, with 0 indicating areas considered least favourable for bats and 100 indicating areas considered most favourable for bats, in terms of habitats present. Several factors are incorporated into the model to give an overall estimate of the suitability of an area for bats, including land cover, topography, climate, soil pH and riparian habitat (Lundy, et al., 2011). The suitability index is presented for all bat species overall, as well as by individual species The scores are divided into five qualitative categories of suitability, namely:

- 0.000000 - 13.000000: Low;
- 13.000001 - 21.333300: Low – Medium;
- 21.333301 - 28.111099: Medium;
- 28.111100 - 36.444401: Medium – High; and
- 36.444402 – 58.555599: High.

[3] This system of categorisation aligns with BS 8596:2015 Surveying for bats in trees and woodland (BSI, 2015)

14.4.3.4.2 Preliminary bat roost assessment

A preliminary bat roost assessment of Potential Roost Features (PRFs) within trees was completed on the 21st of April 2023, in adherence to best practice guidelines (Collins, 2016 and Marnell et al., 2022). This was undertaken to determine the suitability of the Site for roosting bats and the potential requirement for further surveys to be undertaken. PRF's can be defined in four broad terms of suitability as described in Table 14.1, negligible, low, moderate and high.

A Phase 1 inspection was undertaken to make a list of the trees within the Proposed Development Site that may be suitable as roosting sites for bats. Inspections were undertaken visually with the aid of a strong torch beam (AP Pros-Series 220 Lumens High Performance Spotlight) and Celestron12x56 Prism Binoculars during the daytime searching for PRFs, if visible. To aid this Phase 1 inspection, tree reports, where available, were consulted to supplement the data collected.

14.4.3.4.3 Dusk transect activity survey and analysis

The Site was assessed by experienced ecologists in relation to potential bat foraging habitat and commuting routes. Three dusk transect activity bat surveys were conducted on the 17th of May 2023, 28th of June 2023 and 18th of July 2023. All survey dates were undertaken at the appropriate time of year (April – October), in optimal weather conditions (i.e., calm, dry and warm) as per Bat Conservation Trust guidelines (Collins, 2016 and Marnell et al., 2022). The survey details are outlined in Table 14.2.

Table 14.2.Bat Activity Survey Conditions and Survey Details.

Survey Date	Time of Sunset	Survey Period	Weather Conditions			
			Precip.	Cloud	Wind	Temp
17/05/2023	21:26	21:26 – 23:26	None	0-25%	Calm	11-16°C
28/06/2023	22:02	22:02 – 00:02	None	0-25%	Light breeze	11-14°C
18/07/2023	21:47	21:47 – 23:47	None	25-50%	Calm	13-16°C

The surveyors were equipped with an Elekon Batlogger M2 detector, powerful L.E.D. torch and head torches. Surveys started at sunset and continued for 2 hours along a predesigned transect route with regular point counts as presented in Figure 14.1. The transect was walked in an anti-clockwise direction, with the order of which stopping point the survey started at on each of the survey dates changed. At each point count location, the surveyor stopped for eight minutes and used target notes for each bat recorded. The number of individual bats were counted where possible. The transect route was walked at a comfortable pace (approx. 5 km/hr) with target notes taken without stopping of any passing bats. This combination of stopping points and walked transects allowed any hotspots in bat activity at the site to be captured and compared and indicates areas of particular importance to the local bat population.

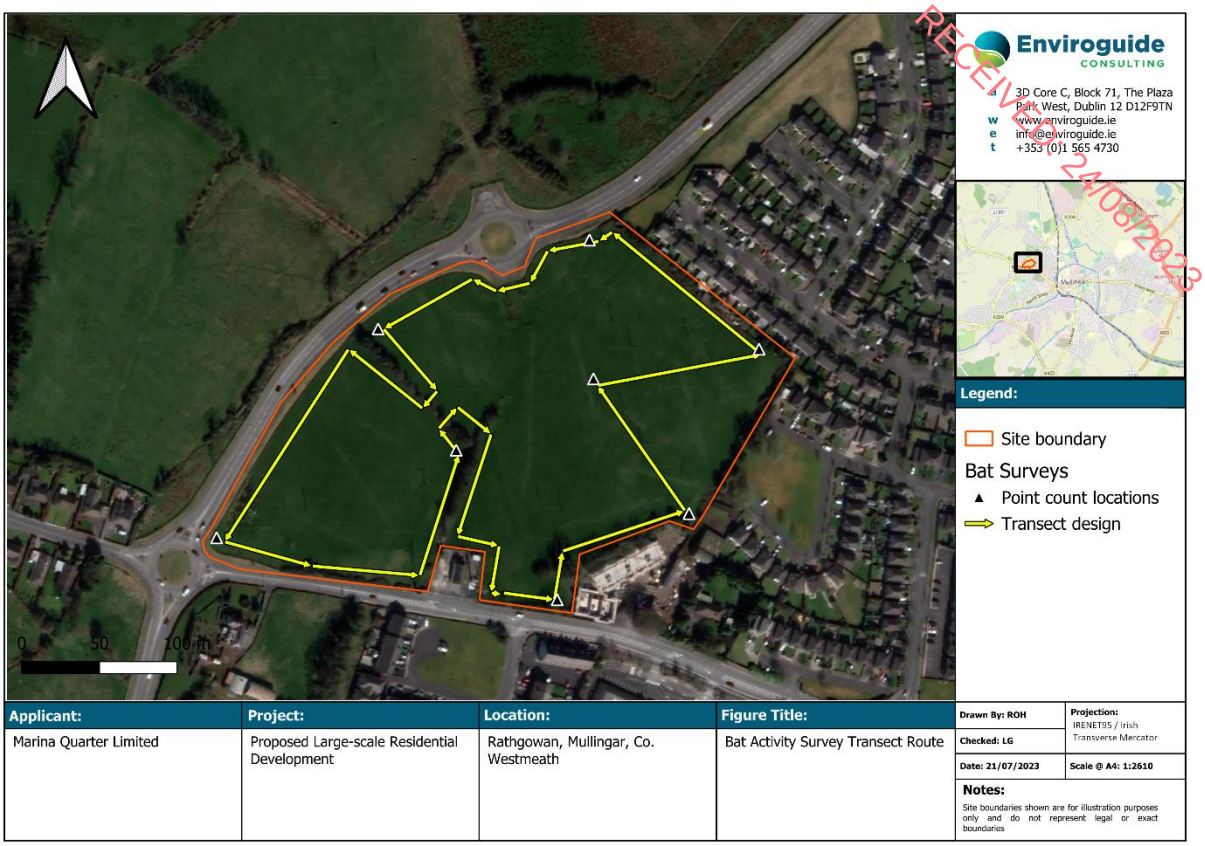

Figure 14.1.Bat Activity Survey Transect Route with point count locations.

The data collected was analysed and species assigned to each record with reference to species identification guides such as Russ (2012). Species were identified from recordings using Elekon's BatExplorer software (Version 2.1.10.1).

Each record i.e., a sequence of bat calls/pulses, is noted as a bat pass; to indicate the level of bat activity for each species recorded. Each bat pass does not correlate to an individual bat but is representative of bat activity levels. Some bats such as Pipistrelle species may continuously fly around a habitat or feature, therefore, it is possible that a series of bat passes within a similar time frame is representative of an individual bat. On the other hand, Leisler's bats (*Nyctalus leisleri*) tend to travel through an area quickly, and as such, an individual sequence or bat pass is more likely to be indicative of individual bats.

14.4.3.4.4 Previous bat activity surveys

A bat activity survey was undertaken at the Site of the Proposed Development and the adjacent Site within the applications landholding north of the C-link Road on the 15th of July 2022. The survey began at 21:05 and finished at 23:30 (sunset on the night was 21:37). Survey methodologies followed those of the Bat Conservation Trust Bat Surveys for Professional Ecologists: Good Practice Guidelines (Collins, 2016). Bat surveys were undertaken within the recommended survey period of May to September. The survey was undertaken in optimal conditions for bat surveys i.e., calm, dry and warm (temperature on the night was 14°C with a gentle breeze).

14.4.3.5 Bird survey

During the habitat survey in April 2023, a bird scoping survey was completed. A bird scoping survey was also undertaken at the Site of the Proposed Development in July 2022 by Enviroguide Consulting. 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 surveys, the Site was walked slowly, approaching all habitat within and adjacent to the Proposed Development and scanning and listening for birds.

14.4.3.6 Other fauna

A general fauna survey of the Site was carried out in conjunction with the other field surveys on the 21st of April 2023. The habitat types recorded throughout the survey area were used to assist in identifying the fauna considered likely to utilise the area. This survey considers protected or notable fauna that may occur within the Site or in the adjacent lands, but for which no historical records from the relevant grid square exists or no targeted surveys were carried out.

14.4.4 Ecological assessment

This ecological assessment 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.

14.4.4.1 Evaluation of ecological features

The value of 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 14.1. 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 chapter.

14.4.4.2 Impact assessment

As per the 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, 2022), presented in Appendix 14.2. 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.

14.4.4.3 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 14.4.1.9) 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.

14.4.5 Consultation

Consultations were not deemed necessary as part of this assessment.

14.5 Difficulties Encountered

An extensive search of available datasets for records of rare and protected species within proximity to 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.

No limitations were encountered which would prevent robust conclusions being drawn as to the potential impacts of the Proposed Development.

14.6 Baseline Environment

This section sets out the baseline conditions for the ecological features within the Site using the findings of the desk study and field surveys.

14.6.1 Site overview

The study area, which is 5.95 hectares in area, is located within the townland of Rathgowan within the development boundary of the town of Mullingar. The Site is located to the northwest of the town centre. It is located to the south of the R394 (known locally as the 'C-Link' Road) which connects to the N4 to the north and N52 to the south. The Site is accessible via the existing entrances off the roundabout on the R394.

The area surrounding the Site is characterised by a mix of uses. The lands immediately adjoining the Site to the east and south have been developed for residential use and generally comprise two storey detached and semi-detached dwellings. The R394 or C-Link bounds the Site to the north and Ashe Road and an ESB substation bound the Site to the south. The Site is relatively flat and comprises of agricultural fields currently in use for grazing livestock with boundary treelines and hedgerows.

Permission was previously granted by Westmeath County Council for Phase 1 and 2 of a residential development (Planning References: 21/97 and 21/139). Both planning applications are currently at appeal stage with An Bord Pleanála. The current proposed Large-scale Residential Development (LRD) scheme will replace these two previously permitted applications if granted.

Phase 3 of this residential development was granted planning permission in January 2023 by Westmeath County Council under the LRD system. This Phase is located northwest of the subject Site, on the opposite side of the R394. The Site location is shown in Figure 14.2.

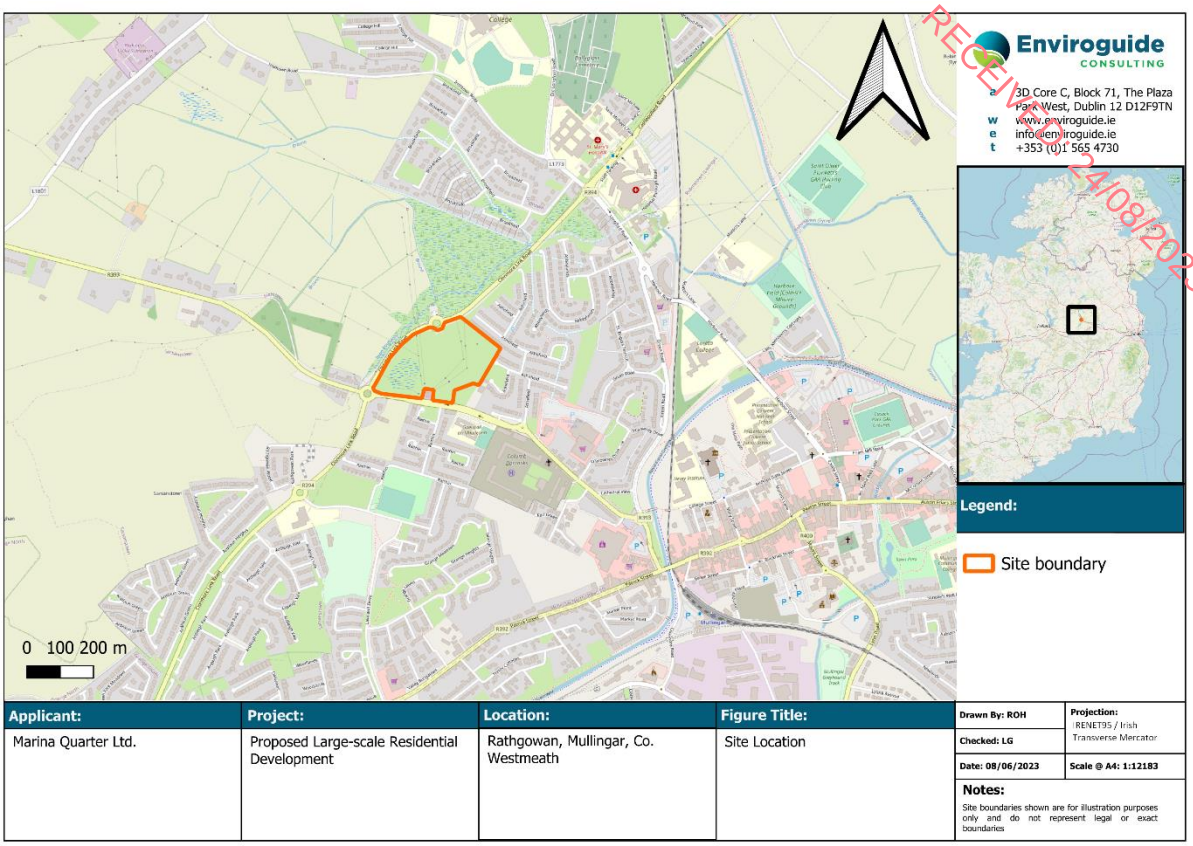

Figure 14.2. Site location.

14.6.2 Geology, Hydrology and Hydrogeology

The Site of the Proposed Development is within the Lower Shannon catchment and Brosna_SC_010 sub catchment (EPA, 2023).

The River Brosna lies 0.6km northeast of the Proposed Development. The River Brosna flows through Mullingar Town prior to discharging to Lough Ennell 3.9km south of the Proposed Development. The River Brosna (IE_SH_25B090006) was assigned a Water Framework Directive (WFD) status of Poor and the waterbody is At Risk of not achieving its status objectives under the WFD (EPA, 2023).

Downstream of the Proposed Development Site at two locations, the River Brosna was assigned a Q-Value of 3 (i.e., Poor quality) in the most recent EPA water quality assessment carried out (2021, station codes RS25B09004 and RS25B090100) (EPA, 20223). Lough Ennell was assigned a WFD status of Good and the waterbody risk of not achieving its status objectives under the WFD is currently under Review (EPA, 2023). The Royal Canal main line (Lower Shannon) lies 0.5km southeast of the Proposed Development. The Royal Canal (Code: IE_25A_AWB_RCMLW) has a WFD status of Good and is Not At Risk of not meeting its status objectives under the WFD (EPA, 2023).

The majority of the Site is situated on the Inny (IE_SH_G_110) groundwater body (GWB), a minor portion of the Site (in the southwest corner) is within the Clara GWB (IE_SH_G_240). Both groundwater bodies are assigned a status of Good and Not At Risk of not achieving their status objectives under the WFD. Groundwater flow paths in the Inny GWB will be short, in general between

30m and 300m with groundwater discharging locally to rivers and streams. The majority of groundwater flow is likely to circulate in the upper tens of metres of bedrock, recharging and discharging in local zones. The main discharges from the Inny GWB will be local, to the River Inny and its tributaries crossing the groundwater body. Groundwater flow paths in the Clara GWB are generally short, on the order of 30m to 300m, with groundwater discharging to the streams and rivers that traverse the aquifer and to small springs. Local groundwater flows are determined by the local topography. There is no regional flow system in these aquifers. The majority of groundwater flow is likely to circulate in the upper 15m metres of the bedrock aquifer. Based on the topography, regional groundwater flow in the vicinity of the Site of the Proposed Development is likely to flow in a north to northeast direction towards the River Brosna.

The aquifer type in the area is Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones (GSI, 2023). The groundwater rock units underlying the Site are classified as Dinantian Upper Impure Limestones. The level of vulnerability to groundwater contamination from human activities is High throughout the Site (GSI, 2023).

The quaternary sediments at the Site are comprised of Till derived from limestone. The majority of soils beneath the Site are mapped as grey brown Podzolics, brown Earths. The soils beneath a small area along the southwest boundary of the Site are mapped as surface water gleys (GSI, 2023). The bedrock beneath the Site is mapped as dark limestone and shale (‘calp) of the Lucan Formation (New Code: CDLUCN) (GSI, 2023).

14.6.3 Designated sites

All European sites potentially linked to the Proposed Development have been identified and full assessed in the AA Screening Report (Stage I AA) (Enviroguide, 2023) accompanying this submission under a separate cover. A summary of the AA conclusion is given below.

Other nationally or internationally designated sites potentially linked to the Proposed Development are identified in section 14.6.3.2.

14.6.3.1 European sites – Appropriate Assessment

The AA Screening identified four European sites with a S-P-R connection to the Proposed Development, namely Lough Ennell SAC, Lough Ennell SPA, Lough Owel SAC and Lough Owel SPA, however the potential for the Proposed Development to result in significant effects to the European sites was ruled out. The following conclusion is extracted from the AA Screening Report accompanying this application under a separate cover:

“*The Proposed Development at Rathgowan, Mullingar, Co. Westmeath has been assessed taking into account:*

- *The nature, size and location of the proposed works and possible impacts arising from the construction works associated with, and operation of, the Proposed Development.*
- *The QIs and conservation objectives of the European sites*
- *The potential for in-combination effects arising from other plans and projects.*

In conclusion, upon the examination, analysis and evaluation of the relevant information and applying the precautionary principle, it is concluded by the authors of this report that the possibility ***may be excluded*** *that the Proposed Development will have a significant effect on any of the European sites listed below:*

- *Lough Owel SAC (000688).*
- *Lough Owel SPA (004047).*
- *Lough Ennell SAC (000685).*
- *Lough Ennell SPA (004044).*

In carrying out this AA screening, mitigation measures have not been taken into account. On the basis of the screening exercise carried out above, it can be concluded, on the basis of the best scientific knowledge available and objective information, that the possibility of any significant effects on the above listed European sites, whether arising from the project itself or in combination with other plans and projects, can be excluded in light of the above listed European sites' conversation objectives. Thus, there is no requirement to proceed to Stage 2 of the Appropriate Assessment process; and the preparation of a NIS is not required."

14.6.3.2 S-P-R links to other designated sites

Potential impact pathways are discussed in the following sections in the context of the Proposed Development as described in section 14.4.2.

No NHAs are located within or directly adjacent to the Proposed Development. The nearest NHA is Wooddown Bog NHA, 4.1km east of the Site. The Proposed Development maintains no S-P-R connection with Wooddown Bog NHA.

14.6.3.2.1 Direct pathways

14.6.3.2.1.1 Hydrological pathways

The nearest pNHA to the Proposed Development is the Royal Canal pNHA, 0.5 km east of the Site. The Proposed Development maintains no hydrological connection with the Royal Canal.

Lough Ennell and Lough Owel pNHA are both also designated as pNHAs and Ramsar Sites. These sites overlap with the Lough Ennell and Lough Owel SACs and SPAs, for which a potential hydrological pathway from the Proposed Development has been assessed and ruled out as part of the AA Screening accompanying this application (Enviroguide, 2023). As such, the S-P-R connection to these other designated sites in Lough Ennell and Lough Owel can also be ruled out.

14.6.3.2.2 Hydrogeological pathways

The Proposed Development maintains a potential weak hydrogeological connection with the Royal Canal pNHA via the Inny and Clara GWB. While there are no surface water pathways, there is a potential for groundwater discharge to reach the GWB. During groundworks and other construction activities as a result of the Proposed Development, the ground may be exposed and any potential accidental discharges to ground could potentially migrate vertically downward to the underlying GWB and laterally to reach the Royal Canal pNHA.

14.6.3.2.3 Air and land pathways

The Construction Phase of the Proposed Development could introduce dust and noise impacts transferable via air and land pathways, as well as increased lighting and human activity at the Site and in the vicinity of the Site during the Construction and Operational Phases.

No designated sites are linked to the Site via air or land pathways due to the urban location of the Proposed Development and the distance between the Site and the nearest designated site.

14.6.3.2.4 Indirect pathways

No indirect pathways to any nationally or internationally designated sites were identified.

14.6.4 Habitats

The habitats present within the Site, as recorded during the field survey, are described in this section and summarised below. Site photographs of the habitats present are included in the following sections and a habitat map of the Site is presented in Figure 14.3.

There are no habitats on Site that are listed in Annex I of the Habitats Directive. The Site is dominated by species poor Improved Agricultural Grassland (GA1) habitat with boundary Treelines (WL2), Hedgerows (WL1) and areas of Scrub (WS1) habitat. A small area (approximately 1,280m^2) of Wet Grassland (GS4) habitat associated with a depression in the land lies at the southwest of the Site, scattered areas of Recolonising Bare Ground (ED3) were mapped throughout the Site. A section of Amenity Grassland (GA2) and Buildings and Artificial Surfaces (BL3) habitat associated with the C-link Road and Ashe Road are included within the Proposed Development Site boundary.

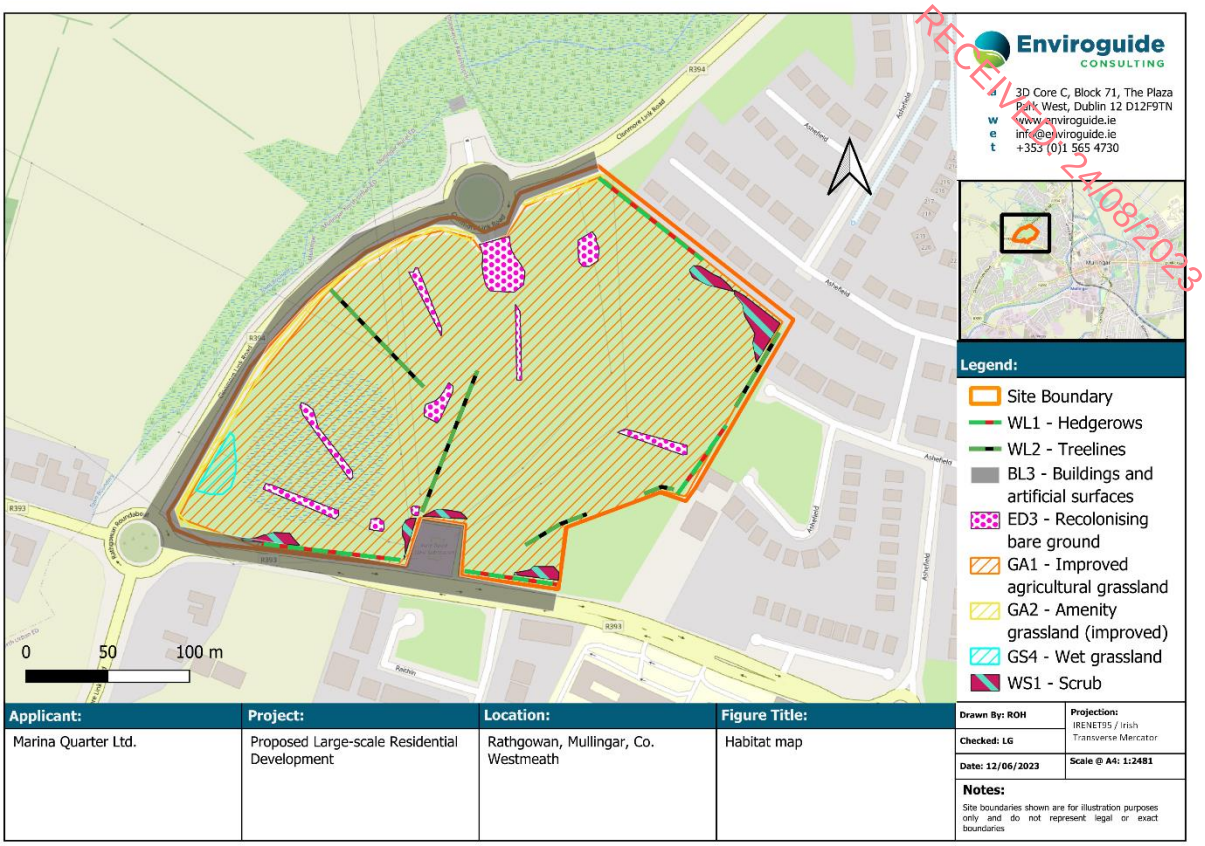

Figure 14.3. Habitat map of the Site.

14.6.4.1 Improved Agricultural Grassland (GA1)

This habitat dominates the Site of the Proposed Development and contains a low diversity of flora (Figure 14.4). Species recorded within this habitat include perennial rye grass *(Lolium perenne*), Yorkshire fog (*Holcus lanatus*), cock's foot (*Dactylis glomeratus*), meadow foxtail (*Alopecurus pratensis*), creeping buttercup (*Ranunculus repens*), daisy (*Bellis perennis*), dandelion (*Taraxacum vulgaria*), broadleaved dock (*Rumex obtusifolius*) and creeping thistle (*Cirsium arvense*).

Figure 14.4. Improved agricultural grassland (GA1) habitat on Site.

14.6.4.2 Wet grassland (GS4)

A small area of wet grassland (GS4) habitat lies at the southwest corner of the Site, typical species recorded here include soft rush (*Juncus effusus*), creeping bent-grass (*Agrostis stolonifera*), perennial rye grass, curled dock (*Rumex crispus*) and cuckoo flower (*Cardamine pratensis*) (Figure 14.5).

Figure 14.5. Wet grassland (GS4) habitat on Site.

14.6.4.3 Hedgerows (WL1) and treelines (WL2)

The Site boundaries are composed of hedgerows (WL1) and treelines (WL2) except for the Site boundary with the C-link Road which is fenced and bordered by amenity grassland (GA2) along the road. The southern boundary is composed of a fenced area to the south west and a managed hedgerow (WL1) dominated by hawthorn (*Crataegus monogyna*), elder (*Sambucus nigra*), bramble (*Rubus fruticosus*) and snowberry (*Symphoricarpos alba*) to the south east (Figure 14.6). The north eastern boundary contains a more natural hedgerow dominated by hawthorn and elder with an understorey of bramble.

Treeline (WL2) habitat lies along the eastern boundary of the Site bordering Ashfield residential estate. This treeline is dominated by hawthorn, ivy (*Hedera helix*), and occasional ash (*Fraxinus excelsior*) trees. Ground flora within this treeline is dominated by bramble, ivy, nettle (*Urtica dioica*), bush vetch (*Vicia sepium*), cleavers (*Galium aparine*), creeping buttercup and periwinkle (*Vinca major*).

A gappy treeline (WL2) lies along the south-eastern boundary of the Site, this treeline is along the Proposed Development Site boundary, however the majority of this treeline is within the boundary of the adjacent permitted planning application (Planning Reference: 196121). This treeline is dominated by hawthorn and ash.

The centre of the Site is traversed by two lines of overgrown hedgerows which are now best classified as a treeline (WL2) (Figure 14.7). These treelines are dominated by hawthorn with occasional blackthorn (*Prunus spinosa*) and elder. The base of these treelines were noted as gappy with a very sparse understorey dominated by bramble, nettle and wood avens (*Geum urbanum*).

Figure 14.6. Hedgerow (WL1) habitat on Site.

Figure 14.7. Treeline (WL2) habitat on Site.

14.6.4.4 Scrub (WS1)

Scrub habitat was identified adjacent to the various field boundaries at the Site. The scrub habitat was dominated by bramble with scattered immature hawthorn also present (Figure 14.8).

Figure 14.8. Scrub (WS1) habitat present on Site.

14.6.4.5 Amenity grassland (GA2)

A small strip of amenity grassland lies adjacent to the C-Link Road which is included in the Site boundary.

14.6.4.6 Buildings and artificial surfaces (BL3)

Buildings and artificial surfaces habitat within the Site boundary consists of sections of the C-Link Road and Ashe Road and associated footpaths.

14.6.4.7 Recolonising bare ground (ED3)

Scattered areas of recolonising bare ground were recorded throughout the Site consisting of a gravel substrate and early colonising vegetation such as dandelion and dock.

14.6.5 Species and species groups

14.6.5.1 Flora

14.6.5.1.1 Rare and protected flora

The Site of the Proposed Development is located within the Ordnance Survey 2km grid square N45G and 1km grid square N4253. Species records from the NBDC online database for these grid squares were studies for the presence of rara and/or protected species within the last 20 years. This database contained no records of protected flora within the last 20 years.

The FPO Bryophytes database was also checked for rare and protected flora records within the vicinity of the Proposed Development. No rare and/or protected bryophyte records exist within the immediate vicinity of the Proposed Development.

No rare or protected flora species were recorded on Site during the field surveys in April 2023.

14.6.5.1.2 Invasive plant species

There are records for five species of flora considered to be invasive within the grid squares which encompass the Site of the Proposed Development. Details of these records are listed in Table 14.3.

Table 14.3. Records of non-native flora species for the surrounding 2km grid square N45G.

Species	Grid square	Date of last record	Source	Designation
Sycamore (*Acer pseudoplatanus*)	N45G	16/07/2020	Community foundation for Ireland Records	▪ Medium impact invasive species
Himalayan honeysuckle (*Leycesteria Formosa)*	N45G	16/07/2020	Community foundation for Ireland Records	▪ Medium impact invasive species
Butterfly-bush (*Buddleja davidii)*	N45G	16/07/2020	Community foundation for Ireland Records	▪ Medium impact invasive species
Japanese knotweed (*Reynoutria japonica*)	N45G	30/01/2019	Vascular plats: online atlas of vascular plants 2012 onwards	▪ High impact invasive species ▪ Regulation S.I. 477/2011 (Ireland)
Canadian waterweed (*Elodea canadensis*)	N45G	08/10/2008	River biologists' database (EPA)	▪ High impact invasive species ▪ Regulation S.I. 477/2011 (Ireland)

No legally controlled invasive plant species listed on Schedule III of the Birds and Habitat Regulations (2011) were recorded during the field surveys in April 2023. Non-native species snowberry was recorded within the southern boundary hedgerow. Snowberry is considered a low risk of impact invasive species (NBDC, 2023).

14.6.5.2 Mammals (excl. bats)

Records for terrestrial mammals were obtained from the NBDC online database. Table 14.4 lists these species, their date of last record and summarises their protected status/designation. In total, two

mammal species were recorded within the grid squares which encompass the Proposed Development Site.

Table 14.4. Records of terrestrial mammals for the surrounding 2km grid square N45G

Species	Grid square	Date of last record	Source	Designation
European otter (*Lutra lutra*)	N45G	06/01/2015	Atlas of Mammals in Ireland 2010 - 2015	▪ Wildlife Act 1976 (as amended). ▪ EU Habitats Directive – Annex II & IV.
West European hedgehog (*Erinaceus europaeus*)	N45G	04/06/2021	Hedgehogs of Ireland	▪ Wildlife Act 1976 (as amended). ▪ Bern Convention Appendix III

There was no evidence of mammal use observed on Site during the ecological walkover. No badger (*Meles meles*) setts or signs of badger presence (e.g., snuffle holes, latrines, tracks) were recorded on or adjacent to the Site during the April 2023 survey. The treelines on Site were noted to be overgrown with a gappy understorey and the open nature is not considered optimal for badger setts. There is potential habitat for hedgehogs (*Erinaceus europaeus*) and pygmy shrew (*Sorex minutus*) within the treelines, hedgerows and areas of scrub.

The Proposed Development Site did not present as particularly suitable for any other protected mammal species other that bat species. It is surrounded by residential development and is very open in nature. There are no streams or wet drainage ditches on Site to attract otter (*Lutra lutra*) and no wooded areas extensive enough to attract other mammals such as red squirrel (*Sciurus vulgaris*) or pine marten (*Martes martes*).

14.6.5.3 Bats

Records for bat species recorded in the 2km grid square associated with the Site were retrieved from the NBDC online database. One species of bat has been recorded within the 2km N45G grid square. Table 14.5 lists the species, the date of last record and their protection status.

Table 14.5. Records of bats for the surrounding 2km grid square N45G

Species	Grid square	Date of last record	Source	Designation
Leisler's bat (*Nyctalus leisleri*)	N45G	19/05/2011	National Bat Database of Ireland	▪ Wildlife Act 1976 (as amended). ▪ EU Habitats Directive – Annex IV

The Proposed Development Site (indicated in Figure 14.9 in blue) is located in an area with an overall Medium-High (34.22) suitability for bats in general. The suitability index for specific bat species is presented in Table 14.6. The landscape suitability index is high for five species of bats; soprano pipistrelle (*Pipistrellus pygmaeus*), brown long-eared bat (*Plecotus auritus*), common pipistrelle (*Pipistrellus pipistrellus*), leisler's bat and natterer's bat (*Myotis nattereri*).

Table 14.6. Landscape suitability index for individual bat species within the 2km grid square (source: NBDC).

Species	Suitability index
Soprano pipistrelle *(Pipistrellus pygmaeus)*	46 (High)
Brown longed-eared bat *(Plecotus auritus)*	39 (High)
Common pipistrelle *(Pipistrellus pipistrellus)*	55 (High)
Lesser horseshoe bat *(Rhinolophus hipposideros)*	1 (Low)
Leisler's bat *(Nyctalus leisleri)*	50 (High)
Whiskered bat *(Myotis mystacinus)*	12 (Low)
Daubenton's bat *(Myotis daubentonii)*	33 (Medium-High)
Nathusius' pipistrelle (*Pipistrellus nathusii*)	32 (Medium)
Natterer's bat *(Myotis nattereri)*	40 (High)

Figure 14.9. Bat landscape suitability model (All bats) surrounding the Proposed Development Site (Adapted from NBDC).

14.6.5.3.1 Habitat evaluation

The treelines and hedgerows at the Site provide potential commuting and foraging habitat for local bats. There is a good network of linear vegetation at the Site, however the treelines and hedgerows on Site are gappy and limited in their connection to the wider treeline/hedgerow network. There is a lack of woodland areas surrounding the Site with extensive housing to the north, east and south of the Site. The majority of habitats in the immediate vicinity of the Site are buildings and artificial surfaces and improved agricultural grassland. The Site is considered to provide low suitability for commuting and foraging bats as per Table 4.1 of the *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016).

14.6.5.3.2 Potential bat roost assessment

A daytime Potential Bat Roost (PBR) assessment of the trees within the Proposed Development Site was undertaken on the 21st of April 2023. The majority of the trees within the Proposed Development boundary held negligible bat roost potential as per Table 4.1 of the *Bat Surveys for Professional Ecologists: Good Practice Guidelines* (Collins, 2016). Two hawthorn trees within the treeline in the centre of the Site were identified as containing potential roost features (Ivy) however these trees were considered to hold low bat roost potential.

14.6.5.3.3 Dusk transect bat activity surveys

The results of the three survey dates conducted at the Site over the course of May, June and July 2023 are shown in Table 14.7 and shown in Figure 14.10, Figure 14.11 and Figure 14.12. The bat detector metadata is included in appendix 14.3. In total three bat species were detected during the 2023 surveys, common pipistrelle, soprano pipistrelle and leisler's bat. Common and soprano pipistrelle were the most abundant species recorded across the three nights, with occasional leisler's bat activity recoded during the June and July 2023 surveys. Bat activity was low along the C-Link Road, this boundary is subject to a high level of light disturbance and lacked linear vegetation. Very little activity was recorded along the southwestern Site boundary, the boundary vegetation here was generally short and well-maintained hedgerows which may not have supported the same levels of insect prey as the wilder native hedgerows and treelines throughout the Site.

The Site provides limited foraging / commuting habitat due to the isolated nature of the Site and high level of light disturbance due to the boundary street lighting and existing residential housing estates. As would be expected, activity was largely associated with the field boundaries and concentrated along the eastern Site boundary and the internal hawthorn dominated treelines. The highest level of bat activity recorded across the three nights was noted in the northeastern corner of the Site. Common pipistrelle and soprano pipistrelle were recorded foraging along the treeline and scrub at this location across the three 2023 surveys. Leisler's bat was predominantly recorded commuting along the boundary fence at Ashe Road and the C-Link Road.

Table 14.7. Bat results summary data – 2023 summer surveys.

Species Name (common)	Species Name (Latin)	Number of recordings	Number of calls	Peak frequency (kHz)
17/05/2023				
Common pipistrelle	*Pipistrellus pipistrellus*	6	98	46.5
Soprano pipistrelle	*Pipistrellus pygmaeus*	10	102	56.5
28/06/2023				
Common pipistrelle	*Pipistrellus pipistrellus*	20	1,073	46.5
Leisler's bat	*Nyctalus leisleri*	2	8	26.9
Soprano pipistrelle	*Pipistrellus pygmaeus*	35	919	56.5
18/07/2023				
Common pipistrelle	*Pipistrellus pipistrellus*	41	1,412	46.5

Species Name (common)	Species Name (Latin)	Number of recordings	Number of calls	Peak frequency (kHz)
Leisler's bat	*Nyctalus leisleri*	16	152	26.9
Soprano pipistrelle	*Pipistrellus pygmaeus*	33	1,064	56.5

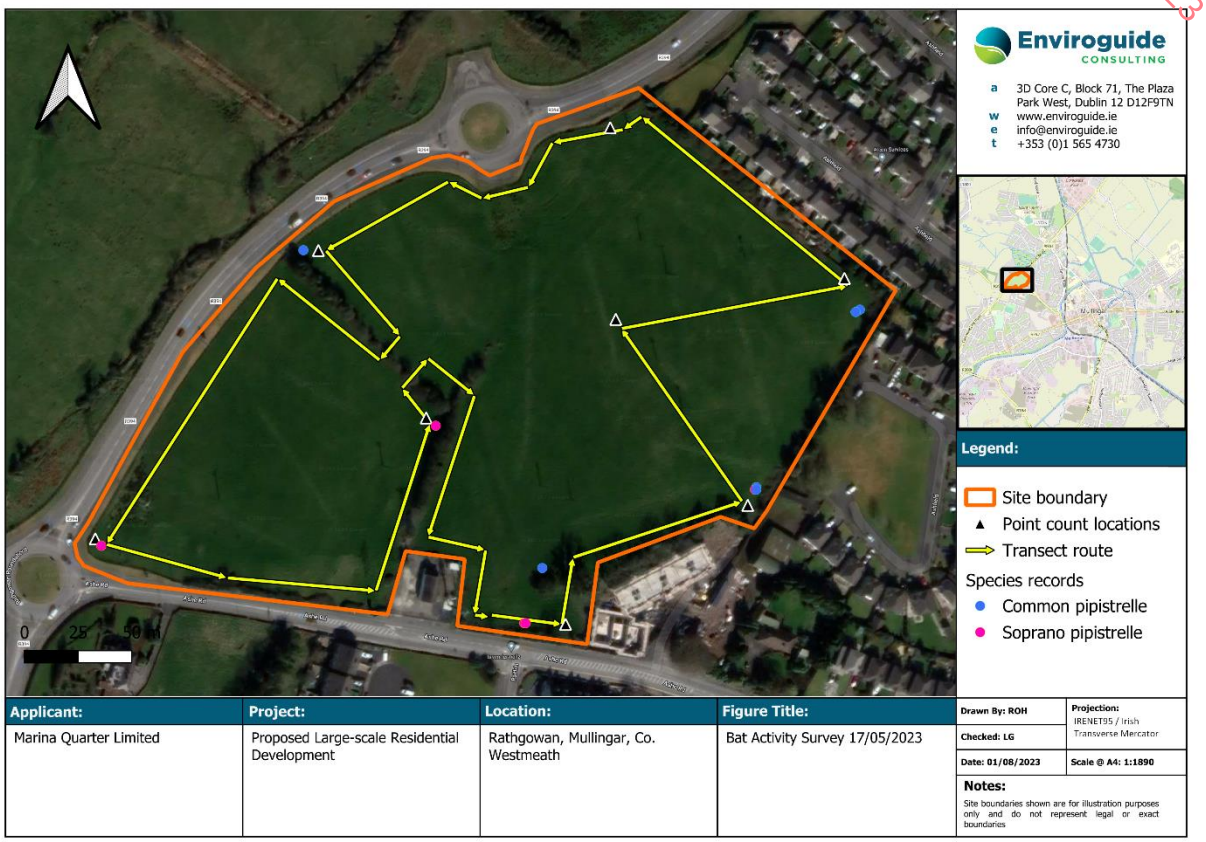

Figure 14.10. Bat activity survey with legend – May 17th, 2023.

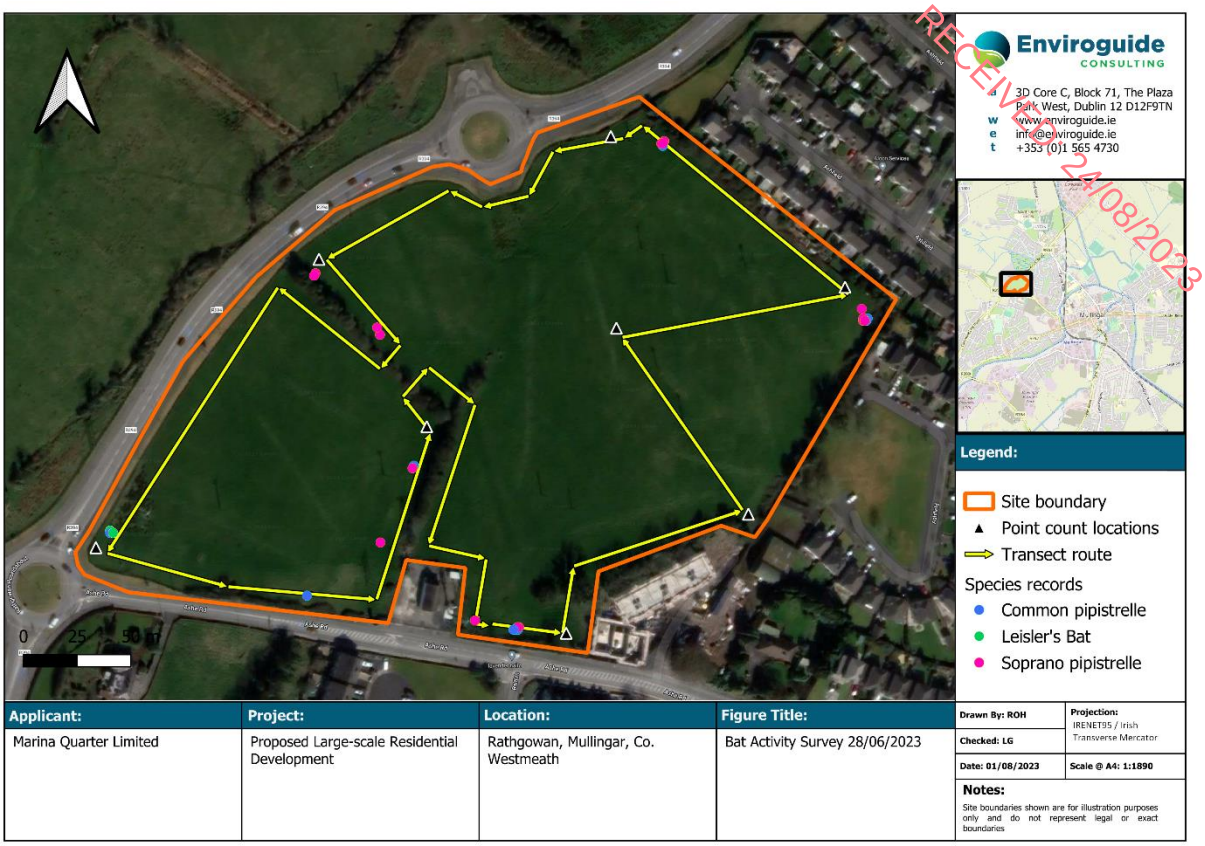

Figure 14.11. Bat activity survey with legend – June 28th, 2023.

Figure 14.12. Bat activity survey with legend - July 18th, 2023.

14.6.5.3.4 Previous bat activity surveys at the Site

A previous bat activity survey of the Site was undertaken in July 2022 in combination with a survey of the application's landholding north of the C-link Road. In total, three species of bat were detected in July 2022. The tabulated results are summarized in Table 14.8 and the visual results of the bat surveys are presented in Figure 14.13. The full report is attached in Appendix 14.4.

The passes are indicative of bat activity, and not absolute bat number. Bats tended to pass up and down repeatedly along a treeline which can suggest there are more bats present than is the case. It is noted that bat activity was generally restricted to the treeline / hedgerow in the centre of the Proposed Development Site with little activity noted within the treeline along the northern and north-eastern Site boundary. This may be due to increased lighting along these linear features due to the adjacent residential dwellings.

Table 14.8. Bat results summary data – July 25th, 2022, survey.

Species Name (common)	Species Name (Latin)	Number of passes	Peak frequency (kHz)
Common pipistrelle	*Pipistrellus pipistrellus*	43	46.5
Leisler's bat	*Nyctalus leisleri*	14	26.9
Soprano pipistrelle	*Pipistrellus pygmaeus*	19	56.5

Figure 14.13. Bat activity results with legend – July 25th 2022 survey (Ash Ecology, 2022).

14.6.5.4 Birds

A total of 42 bird species have been recorded within the 2km tetrad N45G by the NBDC. Of these, two are listed as Red, eleven as Amber and twenty-nine as Green in Birds of Conservation Concern in Ireland 2020-2026 (Gilbert et al., 2021).

Red-listed species include:

- Common swift (*Apus apus*)
- Meadow pipit (*Anthus pratensis*)

Amber listed species include:

- Barn swallow (*Hirundo rustica*)
- Black-headed gull (*Larus ridibundus*)
- Common linnet (*Carduelis cannabina*)
- Common starling (*Sturnus vulgaris*)
- European greenfinch (*Carduelis chloris*)
- Goldcrest (*Regulus regulus*)
- House martin (*Delichon urbicum*)
- House sparrow (*Passer domesticus*)
- Mute swan (*Cygnus olor*)

- Skylark (*Alauda arvensis*)
- Willow warbler (*Phylloscopus trochilus*)

During the bird scoping survey on the 21st of April 2023, fifteen species of birds were recorded at the Site (Table 14.9). Of these, three are Amber listed and twelve are Green listed as per The Birds of Conservation Concern in Ireland (Gilbert, et al. 2021).

The hedgerows, treelines and scrub at the Site provide suitable breeding, resting and foraging habitat for regularly occurring populations of bird species protected under the Wildlife Act. Any removal of the hedgerow, treeline and scrub habitat at the Site would need to adopt a precautionary approach and incorporate mitigation measures to avoid harm to any breeding bird species that could potentially be present.

Table 14.9. Bird species recorded during the bird scoping survey on the 21st of April 2023.

Species	Species Name (Latin)	BoCCI Status	Notes
Blackbird	*Turdus merula*	Green	-
Blue tit	*Cyanistes caeruleus*	Green	-
Chaffinch	*Fringilla coelebs*	Green	-
Coat tit	*Periparus ater*	Green	-
Collared dove	*Streptopelia decaocto*	Green	-
Dunnock	*Prunella modularis*	Green	
Goldfinch	*Carduelis carduelis*	Green	-
Hooded crow	*Corvus cornix*	Green	-
House sparrow	*Passer domesticus*	Amber	Observed foraging adjacent the Site.
Robin	*Erithacus rubecula*	Green	-
Rook	*Corvus frugilegus*	Green	-
Starling	*Sturnus vulgaris*	Amber	-
Swallow	*Hirundo rustica*	Amber	Foraging at the Site, likely nesting within the agricultural shed east of the Site.
Song thrush	*Turdus philomelos*	Green	-
Woodpigeon	*Columba palumbus*	Green	-

14.6.5.4.1 Previous bird scoping survey

A bird scoping survey was undertaken at the Site and the adjacent applicant's landholding north of the C-Link Road on the morning of the 8th of July 2022. A total of twenty-five bird species were recorded during the breeding bird scoping survey on July 22nd (Table 14.10). Two of which are listed as Red, six as Amber and seventeen as Green in the Birds of Conservation Concern in Ireland (Gilbert, et al., 2021).

Table 14.10. Bird species recorded during the bird scoping survey on the 22nd of July 2022.

Species	Species Name (Latin)	BoCCI Status	Notes
Blackbird	*Turdus merula*	Green	-
Bullfinch	*Pyrrhula pyrrhula*	Green	-
Blue tit	*Cyanistes caeruleus*	Green	Recently fledged young.
Chaffinch	*Fringilla coelebs*	Green	-
Chiffchaff	*Phylloscopus collybita*	Green	-
Collared dove	*Streptopelia decaocto*	Green	-
Dunnock	*Prunella modularis*	Green	Recently fledged young.
Goldcrest	*Regularis regularis*	Amber	-
Goldfinch	*Carduelis carduelis*	Green	-
Hooded crow	*Corvus cornix*	Green	-
House martin	*Delichon urbicum*	Amber	-
House sparrow	*Passer domesticus*	Amber	-
Lesser redpoll	*Acanthis flammea*	Green	-
Meadow pipit	*Anthis pratensis*	Red	-
Robin	*Erithacus rubecula*	Green	Recently fledged young.
Rook	*Corvus frugilegus*	Green	-
Starling	*Sturnus vulgaris*	Amber	-
Stonechat	*Saxicula torguatus*	Green	Recently fledged young.
Swallow	*Hirundo rustica*	Amber	-
Song thrush	*Turdus philomelos*	Green	Recently fledged young.
Swift	*Apus apus*	Red	-
Treecreeper	*Certhia familiaris*	Green	-
Woodpigeon	*Columba palumbus*	Green	-

14.6.5.5 Fish

There are no records of notable fish species within the relevant 2km grid square associated with the Site from the NBDC database. Additionally, there are no waterbodies within the Site of the Proposed Development that could support any fish species.

14.6.5.6 Amphibians

Common frog (*Rana temporaria)* was recorded within the 2km tetrad associated with the Proposed Development Site. Common frog is protected under the Wildlife Acts and Annex V of the Habitats Directive.

There are no watercourses or drainage ditches present on Site and no amphibians were recorded during the April 2023 survey. In addition, there were no bodies of standing water (e.g., puddles or pools) present on Site which would provide suitable habitat for amphibians. The area of wet grassland habitat was dry during the Site visit in April 2023 and July 2022. Although wet grassland habitat can provide potential habitat for amphibians, due to the isolated nature of the wet grassland at the Site and the up-built nature of the adjacent habitats, the Proposed Development Site is not considered to provide significant habitat for amphibians.

14.6.5.7 Reptiles

Common lizard (*Zootoca vivipara)* was recorded within the 2km tetra associated with the Proposed Development Site. The common lizard is protected in Ireland under the Wildlife Acts.

There was limited mosaics of suitable habitat present on Site for common lizard. The scrub habitat on Site may provide potential sheltering habitat for common lizard, however given the isolated nature of the habitats present the Site is highly unlikely to provide significant habitat for common lizard.

14.6.5.8 Other species / species groups

No other protected species are considered to be within the ZOI of the Proposed Development.

14.6.6 Designated sites, habitat and species evaluation

The ecological value of designated sites, habitats, flora and fauna associated with the Proposed Development Site are evaluated in Table 14.11. This evaluation follows the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009). KERs are those ecological receptors for which detailed assessment is required, on the basis of ecological value and likely significant impacts. The rationale behind these evaluations is also provided. Ecological resources of below 'Local Importance (higher value)' should not be selected as 'KER' for which detailed assessment is required (NRA,2009).

Table 14.11. Evaluation of designated sites, habitats, flora and fauna associated with the Proposed Development Site.

Designated sites / species / habitats	Evaluation	Key Ecological Receptor (KER)	Notes
Designated sites			
SACs & SPAs	International Importance	No	These sites have been assessed in detail in the AA Screening that accompanies this application under a separate cover. The Proposed Development will not result in significant effects to any European site.
pNHAs / NHAs	National Importance	Yes – Royal Canal pNHA	Lough Owel and Lough Ennell pNHA have been assessed by proxy in the AA Screening that accompanies this application, no significant effects impacts envisaged. An S-P-R connection between the Site and the Royal Canal pNHA was identified via the underlying GWB.
Lough Owel and Lough Ennell Ramsar Sites	International Importance	No	These sites have been assessed by proxy in the AA Screening that accompanies this application. No significant impacts envisaged.
Habitats			
BL3 – Buildings and artificial surfaces	Local importance (lower value)	No	Artificial habitat of little biodiversity value
ED3 – Recolonising Bare Ground.	Local importance (lower value)	No	Artificial habitat of little biodiversity value
GA1 – Improved Agricultural Grassland	Local importance (lower value)	No	Moderately intensively managed agricultural grassland with a low level of plant diversity. Provides some foraging resource for birds and pollinating insects, but not considered of conservation value due to the abundance of similar habitat in the local area.
GA2 – Amenity Grassland	Local importance (lower value)	No	Small area of managed amenity grassland on roadside verge with a low level of plant diversity.
GS4 - Wet Grassland	Local importance (lower value)	No	Small area of wet grassland present on Site with a low level of plant diversity recorded. Not considered of conservation value at the Site scale.
WS1 – Scrub	Local importance (lower value)	No	Small areas of this habitat present throughout the Site. May provide some shelter/foraging habitat for local fauna, but not considered of conservation value due to the small area of habitat and abundance of similar habitat in the local area.

Designated sites / species / habitats	Evaluation	Key Ecological Receptor (KER)	Notes
WL1 – Hedgerow	Local importance (higher value)	**Yes**	May provide important nesting, resting and foraging habitat for local birds and bats.
WL2 – Treeline	Local importance (higher value)	**Yes**	May provide important nesting, resting and foraging habitat for local birds and bats.
Fauna			
Small mammals e.g., Eurasian pygmy shrew and hedgehog	Local importance (higher value)	**Yes**	No evidence of these species recorded during the field survey; however these small mammals may utilize the habitats at the Site which will be affected by the Proposed Development, namely the grassland, hedgerow and small areas of scrub habitats.
Badger	Local importance (lower value)	No	The badger is an adaptable species of lowland grassland and woodland habitats (Marnell et al., 2009). No setts or tracks were identified during the surveys, and the habitats at the Site have limited suitability for badger.
Red squirrel and pine marten	Local importance (lower value)	No	No wooded areas extensive enough to attract these mammals.
Otter	Local importance (lower value)	No	No suitable habitat present within the Site for otter, the Site does not contain any flowing waterbodies or drainage ditches.
Bat Assemblage	Local importance (higher value)	**Yes**	Three species of bat recorded in the Site environs. The Site provides low suitability foraging and commuting habitat for local bats due to its isolated nature and high levels of light disturbance.
Bird Assemblage	Local importance (higher value)	**Yes**	Red, Amber and Green-listed species recorded on Site, as well as in the NBDC data for the general area. Suitable breeding and foraging habitat for a range of common and widespread bird species.
Amphibians	Local Importance (lower value)	No	NBDC records for common frog in the 2km Grid Square encompassing the Site however no suitable habitat such as drainage ditches or standing water for common frog or smooth newt noted during the field surveys.
Reptiles	Local importance (lower value)	No	NBDC records for common lizard in the 2km Grid Square encompassing the Site. No evidence of common lizard on Site. The Site is not expected to hold a provide significant habitat of common lizard due to the limited resources available for the species. For the

Designated sites / species / habitats	Evaluation	Key Ecological Receptor (KER)	Notes
			most part, the Site of the Proposed Development is composed of grazed and managed grassland of uniform short sward height.
Fish	Local importance (lower value)	No	No potential habitat on Site to support these species.

14.7 The 'Do nothing' Scenario

Should the Proposed Development not go ahead, the Site would continue to be used as grazing pasture for livestock. The treelines, hedgerows and areas as scrub would continue to serve as ecological corridors providing nesting, commuting and foraging habitat for local fauna. The grassland would continue to offer limited resources to local pollinators.

14.8 Potential Significant Effects

As per the Guidelines for Assessment of Ecological Impacts of National Road Schemes (NRA, 2009), likely effects have been assessed for KERs only, as listed in Table 14.11 above. All impacts are described in the absence of mitigation.

The following were identified as KERs:

Designated sites:

- Royal Canal pNHA

Habitats;

- WL1 hedgerows and WL2 treelines.

Species / species groups;

- Small mammals (hedgehog &pygmy shrew).
- Bird assemblage.
- Bat assemblage.

14.8.1 Construction Phase

The construction phase of the Proposed Development will involve Site preparation works, the establishment of construction services and the construction of the proposed units. Site preparation works will involve Site clearance, establishing entranceways and haul roads for vehicles, surveying and setting out, setting up the construction Site fencing and compounds etc.

14.8.1.1 The Royal Canal pNHA

The Proposed Development maintains a potential weak hydrogeological connection with the Royal Canal pNHA via the Inny and Clara GWB. During groundworks and other construction activities as a result of the Proposed Development, the ground may be exposed and any potential accidental discharges to ground could potentially migrate vertically downward to the underlying GWB and laterally to reach the Royal Canal pNHA. The potential impact to the Royal Canal pNHA via groundwater flows from the Site is considered to be *negative, short-term, slight* in the absence of suitable mitigation. The nature of the hydrogeological connection and the distance of 0.5km between the Site and the pNHA have been taken into account when categorising the potential impact of the Construction Phase on the designated site.

14.8.1.2 Habitats and flora

The treeline in the centre and the treelines and hedgerows along the majority of the Site boundaries will be lost, this will result in the loss of twelve trees and approximately 83m of overgrown hedgerow in the centre of the Site and approximately 78m of overgrown hedgerow and scrub at the northern boundary of the Site (Arbo Care, 2023). Seven mature trees, approximately 57.3m of hedgerow along the eastern Site boundary, 38m of scrub along the northwestern Site boundary and 95m of scrub at the Site will be retained and has been incorporated into the Site layout and landscape design. The existing trees on the eastern Site boundary with Ashefield residential development will be retained and enhanced with native planting. The loss of these KER habitats on Site is considered unavoidable due to spatial constraints.

The hedgerow and treeline habitats are gappy with a sparse understorey, however they provide potential nesting, resting, foraging and commuting habitat for local bird and bat populations as well as small mammals (hedgehog and pygmy shrew). The loss of these KER habitats will be offset to a degree by the provision of new, predominantly native hedge and tree planting in the landscape plan for the Proposed Development. However, it will take several years before the newly planted hedges and trees provide the same level of support to local fauna as the existing habitats. Therefore, the loss of these habitats represents a *negative, long-term, moderate* impact at the Site scale.

14.8.1.3 Mammals (excl. bats)

The Site of the Proposed Development contains habitat suitable for small mammals such as hedgehog and pygmy shrew (hedgerow, scrub). Clearance of vegetation may put these species at risk of injury or death if present when clearance is taking place. These species are all highly mobile and would be able to move away from the area of works during vegetation clearance, however when rearing young (typically during spring and summer months) or hibernating (in the case of hedgehogs), these species will have reduced mobility. This risk constitutes a potential *negative, short-term, significant* impact on the local populations of these species.

Small mammals such as hedgehog have the potential to become trapped in excavations or become entangled in construction materials such as netting and plastic sheeting, as well as other waste materials, causing entrapment and injury or death. This constitutes a *negative, short-term, significant* impact at a local scale. Noise and dust generated during the Construction Phase has the potential to cause a disturbance impact on small mammals, in the absence of appropriate mitigation this represents a *negative, short-term, slight* impact.

14.8.1.4 Bats

The Proposed Development will result in the removal of potential commuting and foraging habitat for local bats in the form of linear scrub, hedgerows and treelines. The treeline at the northeast corner of the Site which recorded the highest level of bat commuting and foraging habitat will be retained and protected and has been incorporated into the project design. It is noted that the Site is currently isolated in nature due to the existing residential developments and road networks. None the less, the loss of potential foraging and commuting habitat at the Site represents a *negative, long-term, moderate* impact at a local scale.

Increased construction phase lighting at the Site could impact on bats using the Site during this period, if not maintained in a bat-friendly manner. This represents a *negative, short-term, slight* impact at a local scale given the well illuminated nature of the Site currently.

14.8.1.5 Birds

Several bird species were recorded utilising the habitats on Site. Should vegetation be cleared or cut back during the breeding bird season (March 1st to August 31st); there is the potential for nesting birds to be harmed and nests destroyed. This would be in contravention of the Wildlife Act 1976 (as amended) which provides protection to breeding bird species and their nests and young. In the absence of mitigation or preventative measures, this risk constitutes a *negative, permanent, significant* impact on local bird populations.

The Construction Phase will impact local birds through the loss of suitable foraging/nesting habitat in the form of areas of grassland, treelines, hedgerows and scrub. This will be offset to a degree by the proposed landscape design for the Site. The habitat loss at the Site represents a *negative, permanent, moderate* impact to birds at the Site scale, as the habitats on Site become more anthropogenic and managed in nature.

The increased noise and dust levels associated with the Construction Phase of the Proposed Development may have the potential to cause *negative, short-term, slight* impacts to local bird populations in the absence of mitigation.

14.8.2 Operational Phase

The Operational Phase of the Proposed Development will consist of the normal day to day operations necessary for the management of a residential development and the ongoing maintenance of the dwelling units, operational infrastructure and landscape features.

14.8.2.1 Designated sites

No impacts on any designated sites during the Operational Phase of the Proposed Development are anticipated.

14.8.2.2 Habitats and flora

No further removal of habitats on Site will occur during the Operational Phase of the Proposed Development. Habitats on Site will be managed for ecological and amenity purposes.

14.8.2.2.1 Landscape design

There is opportunity for the Operational Phase of the Proposed Development to offset some of the habitat loss as a result of the Construction Phase. The landscape plan proposes to incorporate pollinator friendly species with a strong emphasis on native species and includes wildflower meadows and bulb planting with a view to successional blooming which prolongs flowering across the Spring, Summer and Autumn, providing cover and foraging for invertebrates and birds, while the wildflower mix provides resources for pollinators. Treelines and hedgerows proposed will provide a reasonable degree of instant maturity to the Site and act to replace the loss of the existing linear features. The

treeline at the northeastern boundary of the Site will be retained and enhanced with native species. Direction lighting is included in this area to ensure the boundary habitat continues to provide foraging habitat for local bats.

The planting palette has been specifically chosen for its pollinator friendly species as well as the overall aesthetic value of the trees, shrubs, and perennials. The landscaped green spaces framed by native trees create a natural link throughout the Proposed Development Site and are anchored by the central green open space. The landscaped areas of the Site provide both active and passive areas for residents to enjoy with an objective to create a natural environment within the Site to invite interaction and communication.

Pollinator friendly species incorporated in the landscape design include robin hill (*Amelanchier x grandiflora*), wild cherry (*Prunus avium*), bird cherry (*Prunus padus*), rowan (*Sorbus aucuparia*), honey suckle (*Lonicera periclymenum*), guelder rose (*Viburnum opulus*), purple sensation (*Allium hollandicum*), karl foerster (*Calamagrostis acutiflora*) and lambs ear (*Stachys byzantina*).

Overall, the landscape design will have a *positive, permanent, significant* impact at a local scale to the Site, replacing a Site dominated by low biodiversity improved agricultural grassland habitat with a variety of pollinator friendly species.

14.8.2.3 Mammals (excl. bats)

The Operational Phase of the Proposed Development has the potential to result in a disturbance impact to local mammals utilising the Site in general through night-time light pollution. This represents a *negative, permanent, moderate* impact in the absence of suitable mitigation.

14.8.2.4 Bats

The Operational Phase of the Proposed Development has the potential to result in a disturbance impact to local bat populations utilising the Site in general through night-time light pollution. This represents a *negative, permanent, moderate* impact in the absence of suitable mitigation.

14.8.2.5 Birds

No significant effects on bird species are anticipated during the Operational Phase of the Proposed Development.

14.8.3 Cumulative Effects

If the Proposed Development and the existing or proposed projects or plans impact on the same KERs, there is potential to lead to cumulative impacts which could be of a higher level of significance. This applies to potential impacts on birds and small mammals due to the combined loss of nesting or foraging habitat in the locality of the Site, and potential impacts on bats and mammals due to the combined loss of suitable foraging and commuting habitat in the locality. The below listed planning applications were all accompanied by the relevant environmental assessments that detail the potential impacts and the mitigation measures required to ensure the developments do not have a significant effect on local biodiversity, alone or in-combination with other developments. Once the

mitigation measures for each of the below projects and this planning application are adhered to, the potential for likely significant cumulative impacts **can be ruled out**.

14.8.3.1 Existing granted planning permissions

A search of planning applications located within a 2km radius of the Proposed Development was conducted using online planning resources including the National Planning Applications Database (MyPlan.ie) and Westmeath County Council's online planning database. Any planning applications listed as granted, application registered or application pending from within the last five years were assessed for their potential to act in-combination with the Proposed Development and cause likely significant effects on local biodiversity. Long-term developments granted outside this time period were also considered where applicable. The larger-scale developments identified within the vicinity of the Site of the Proposed Development are identified below in Table 14.12.

Table 14.12. Nearby permitted or pending planning applications

Planning reference	Location relative to the Proposed Development	Development description
22515	North of the C-Link Road	Permission for the following Large-Scale Residential Development comprising of the construction of 213 no. residential units, 1 no. creche, 1 no. pumping station and all associated ancillary development works including 2 no. ESB sub-stations, footpaths, cycle lane, car and bicycle parking, drainage, bin storage, landscaping/amenity areas and the undergrounding of existing 38KV overhead electricity lines at Rathgowan, Mullingar, Co. Westmeath. Access will be via the existing roundabout on the R394 (C-Link). This development will form Phase 3 of a larger (three-phase) residential development at this location.
Part 8 Application	0.3km east of the Proposed Development.	Part 8 application for the construction of 22 no. dwelling units adjacent to Ashfield/Abbeylands/Green Road and St. Bridget's Terrace, Mullingar, Co. Westmeath.
Part 8 Application	2km east of the Proposed Development	The construction of 17 no. dwelling units on a site at the junction of Delvin & Robinstown Road, Springfield TD, Mullingar, Co. Westmeath.
Part 8 Application	0.8km south of the Proposed Development.	The construction of 15 no. single storey houses on four separate sites at Ennell Court and Trinity Cottages, Mullingar, Co. Westmeath.
Part 8 Application	1.3km east of the Proposed Development.	Proposed Housing Development of 32 no. dwelling units consisting of 19 no. 2 bed units and 13 no. 1 bed units at Friar's Mill Road / Canal Avenue, Mullingar, Co. Westmeath.
21568	0.6 km northwest of the Proposed Development Site.	An extension of duration was sought for 16/6001: planning reference no: 11/5121 for the construction of a new housing development, consisting of 28 no. houses to be constructed in 3 phases made up of a combination of 26 no. detached 2 storey houses (as per condition no.5 of outline permission planning ref. no. 11/4121) with associated services.

Planning reference	Location relative to the Proposed Development	Development description
196159	This site lies 1.8km south of the Proposed Development.	Planning permission was sought for the construction of 98 no. residential units consisting of 14 no. 2 bed terraced houses, 10 no. 3 bed end-terraced houses, 12 no. 3 bed semi-detached houses, 8 no. 4 bed semi-detached houses and 54 no. duplex units (comprising 27 no. 1 bed units and 27 no. 3 bed units). Provision of a creche and community facility, 142 no. car parking spaces, 8 no. motorcycling spaces and 102 no. bicycle spaces. Access from the R390. All site development and servicing works, bin stores, ESB substation, pumping station, open space, landscaping and boundary treatments.
196121	Directly east of the Proposed Development.	Planning permission was sought for the construction of 18 Apartment units in 2 Blocks (Block A & B). Block A consists of 1 no. 1 bedroom units, 3 no. 2 bedroom units and 2 no. 3 bedroom duplex apartment units in 2 and 3 storey high building with private balconies and patios. Block B consists of 6 no. 1 bedroom units and 6 no. 2 bedroom duplex apartment units in 3 storey high building with private balconies and patios. The proposed development will also consist of a new site entrance, shared access road, footpaths, car parking spaces, boundary wall and fence, covered cycle rack, recycling bin storage area, public and private open spaces, partial removal and trimming of existing hedgerows to accommodate proposed site entrance, landscaping and all associated site works and services.

14.9 Mitigation

14.9.1 Construction Phase Mitigation

14.9.1.1 Protection of habitats

Trees that are proposed to be retained on Site (as per the tree protection plan accompanying this application, Drg. No. M-TS-001) will be protected for the duration of the Construction Phase by protective fencing, signage and/or ground protection prior to any materials or machinery being brought on Site and prior to any development or soil stripping taking place. Areas that are designated for new planting will be protected where possible. Barriers will be fit for the purpose of excluding construction activity. In most cases barriers will consist of a scaffold framework comprising a vertical and horizontal framework, well braced to resist impacts. To ensure the protective barriers are respected, clear concise signage will be affixed to the barrier in an unrestricted easily viewer location. The protective barriers will remain in place in an undisturbed condition and only removed on completion of all construction activity. Any breach of the protective fencing will be reported to the consulting arborist.

During the course of the Construction Phase the integrity of the protective fencing must be respected and remain in place at all times. No building materials or soil heaps will be stored within this area.

Should essential works need to take place within the root protection area, the project arborist must be informed in advance and any necessary mitigation measures will be put in place. The protective fencing will remain in situ for the duration of the project and will only be removed upon completion of all works. Construction will only commence once the protective barriers and/or ground protection have been erected.

Further information on Tree Protection measures can be found in the Arboricultural Impact Assessment accompanying this application (Arbo Care, 2023).

14.9.1.1.1 Invasive species

No species of plant listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded at the Site during surveys. As such, no significant risk of impacts relating to the spread of invasive plant species exists at the Site. Nevertheless, efforts should be made to remove the non-native plants on Site and minimise any risk of spread off-Site. The distribution of the non-native species recorded on Site (snowberry) is not significant and its removal will not be an issue.

Transport Infrastructure Ireland (2020) guidance 'The Management of Invasive Alien Plant Species on National Roads – Technical Guidance' will be consulted with regards the treatment, removal and disposal of invasive flora at the Site.

The following measures will be adhered to, to avoid the introduction or dissemination of invasive species to and from the Site of the Proposed Development:

- Validation that all machinery / vehicles are free of Invasive Alien Plant Species (IAPS) prior to their first introduction to Site.
- Certification from the suppliers that all imported soils and other fill/landscaping materials are free of IAPS.
- A regular schedule of Site inspections across the IAPS growing season, for the duration of the construction works.
- Validation that all machinery / vehicles are free of IAPS, prior to leaving the Site.
- Appropriate and effective Site biosecurity hygiene.

14.9.1.2 Surface and ground water protection measures

The Proposed Development includes a detailed drainage plan that is assessed in full In Chapter 6 – Hydrology & Hydrogeology of this EIAR. This drainage plan and all associated measures have been taken into account in this Biodiversity Chapter but are not included in full (to avoid repetition). The drainage design for the Proposed Development will minimise surface water runoff arising at the Site, to adequately control and manage surface water runoff from the Site containing suspended solids and to ensure that the hydrological function of the waterbodies in the vicinity of the Site are not affected by the Proposed Development.

There are no drainage ditches or watercourses within or immediately adjacent to the Proposed Development Site however the public surface water network lies adjacent to the Site along the C-Link Road. This public surface water network eventually discharges to the River Brosna north east of the

Site. As such, standard best practice surface water management measures will be implemented on Site to ensure surface water runoff from the Site containing suspended solids does not reach the public surface water network along the C-Link Road or impact the local underlying groundwater body.

A number of pollution-prevention measures for the Construction Phase of the Proposed Development are described in the outline Construction Environmental Management Plan (CEMP) accompanying this application under a separate cover. All measures outlined in the CEMP are established measures that are widely used in construction projects, and there is a high degree of confidence in their success. The contractor will be required to employ an Environmental Manager to assist with preparing a detailed CEMP and its implementation.

The following pollution prevention measures will be implemented on Site to protect surface water and ground water in the vicinity of the Proposed Development:

- The main compound on Site will include a bunded area for the storage of pollutants, with additional areas for stockpiling of materials.
- There will be no cement washout on Site except for washout of chutes, the washings of which will be collected into an appropriate container for compliant off-Site management.
- Where cast-in-place concrete is required, all work will be carried out in the dry.
- All plant machinery required on Site will be serviced before being mobilised to Site.
- Refuelling of plant during the Construction Phase will only be carried out at designated refuelling stations located on Site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on Site. The plant refuelling procedures will be detailed in the contractor's method statement.
- Spill kits will be made available in each item of plant required on Site.
- A regular review of the weather forecast for extremely 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.
- Only emergency breakdown maintenance will be carried out on Site. Drip trays and spill kits will be available on Site to ensure that any spills from vehicles are contained and removed off Site.
- All personnel working on Site will be trained in pollution incident control response.
- Any other diesel fuel or hydraulic oils stored on Site will be stored in bunded storage tanks. The bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCD005).
- All associated waste from portaloos and/or containerised toilets and welfare units will be removed from the Site by a licenced waste disposal contractor.
- Where there is a requirement to collect and treat surface water within the Site during the Construction Phase, run-off from the working Site or any areas of exposed soil will be channelled and intercepted at regular intervals via perimeter swales. The swales will be installed at low points around the construction areas. If required, water will be pumped from

the swales into sediment bags with overflows directed to land rather than to the public surface water sewer.

- Discharge to land will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge from the silt bag will be enclosed by a perimeter of double silt fencing.
- No pumped construction water will be discharged directly to the public surface water network along the C-Link Road.

14.9.1.3 Protection of fauna

14.9.1.3.1 Site lighting

Site lighting may be required during the Construction Phase, to protect bats and other nocturnal fauna from excess night-time lighting, the following luminaire specifications, taken from the latest guidance (ILP, 2018) will be adhered to during the Construction Phase:

- Retained trees will not incur an increase in the current lux level due to Construction Phase lighting.
- All luminaires 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 sued to reduce the blue light component of the LED spectrum.
- Column heights will be carefully considered to minimise light spill, the shortest column height allowed will be used.
- Only luminaires with an upward light ration of 0% and with good optical control will be used.
- Luminaries will be mounted on the horizontal i.e., no upward tilt.
- External security lighting will be set on motion-sensors and short timers.

14.9.1.3.2 Small mammals

As best practice, all construction related waste on Site e.g., plastic sheeting, netting etc. will be kept in designated areas on Site and kept off ground level to protect hedgehogs from entrapment and possible death. These measures will also act to mitigate potential negative impacts on any other small mammal species potentially utilising the Site.

Trenches/ pits must be either covered at the end of each working day or include a means of escape for any animal falling in e.g., a plank or object placed in the corner of the excavation. Any temporarily exposed open pipe system will be capped in such a way as to prevent fauna gaining access as may happen when contractors are off Site.

14.9.1.3.3 Vegetation clearance

Any clearance of vegetation will be carried out outside the main bird breeding season i.e., outside of the period of 1st of March to 31st of August, in compliance with the Wildlife Ace 1976 (as amended). Should any vegetation removal be required during this period, the precise location within the

hedgerow/trees will be checked for birds or nests by a suitably qualified Ecologist. If encountered, the precise location with the hedgerow/treeline and the species of bird present will be recorded. The area will be protected, and the Site manager will be informed of the presence of nesting birds and advised that no works can commence in this area until further notice. Appropriate protection measures will be implemented in consultation with the project ecologist and a timeline for further surveys will be agreed based on the bird species present.

Table 14.13 provides guidance for when vegetation clearance is permissible. Information sources include the Herpetological Society of Ireland, British Hedgehog Preservation Society's *Hedgehogs and Development and the Wildlife (Amendment) Act*, 2000. The preferred period for vegetation clearance is within the months of late **September and October**. Vegetation will be removed in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g., hedgehog, pygmy shrew). Where this seasonal restriction cannot be observed, a check for active roosts, nests and small mammals will be carried out immediately prior to any Site clearance by an appropriately qualified ecologist/ ornithologist and repeated as required to ensure compliance with legislative requirements.

Table 14.13. Seasonal restrictions on vegetation removal. Orange boxes indicate periods when clearance / works are not permissible.

<table>
<tr><th>Ecology Feature</th><th>January</th><th>February</th><th>March</th><th>April</th><th>May</th><th>June</th><th>July</th><th>August</th><th>September</th><th>October</th><th>November</th><th>December</th></tr>
<tr><td>Breeding birds</td><td colspan="2">Vegetation clearance permissible (Sept – Feb).</td><td colspan="6">Nesting bird season. No clearance of vegetation unless confirmed to be devoid of nesting birds by an ecologist (Mar – Aug).</td><td colspan="4">Vegetation clearance permissible (Sept – Feb).</td></tr>
<tr><td>Bats</td><td colspan="8">Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist (Nov – Aug).</td><td colspan="2">Preferred period for tree-felling</td><td colspan="2">Tree felling to be avoided unless confirmed to be devoid of bats by an ecologist (Nov – Aug).</td></tr>
<tr><td>Small mammals (e.g., hedgehog & pygmy shrew)</td><td colspan="3">Mammal hibernation season. No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an ecologist (Nov – Mar).</td><td colspan="6">Vegetation clearance permissible (April – Oct)</td><td colspan="2">Mammal hibernation season. No clearance of vegetation unless confirmed to be devoid of hibernating mammals by an</td></tr>
</table>

Ecology Feature	January	February	March	April	May	June	July	August	September	October	November	December
											ecologist (Nov – Mar).	

14.9.1.4 Reduction of noise and dust related impacts

14.9.1.4.1 Reduction of noise related impacts

Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing.

Noise generated during the Construction Phase of the Proposed Development could cause temporary disturbance to a number of faunal species in the vicinity of the Site of the Proposed Development. The following best practise measures will be put in place to ensure the minimisation of potential impacts on fauna as a result of the Proposed Development. Limiting the hours during which Site activities likely to create high levels of noise are permitted.

- Establishing channels of communication between the contractor/developer, local authority and residents.
- Appointing a Site representative responsible for matters relating to noise.
- Selection of plant with low inherent potential for generating noise.
- Siting of plant as far away from sensitive receptors as permitted by Site constraints.
- Avoidance of unnecessary revving of engines and switch off plant items when not required.
- Keep plant machinery and vehicles adequately maintained and serviced.
- Proper balancing of plant items with rotating parts.
- Keep internal routes well maintained and avoid steep gradients.
- Minimise drop heights for materials or ensure a resilient material underlies.
- Use of alternative reversing alarm systems on plant machinery.
- Monitoring typical levels of noise during critical periods and at sensitive locations.

These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum.

14.9.1.4.2 Reduction of dust related impacts

The following general dust control measures will be followed for the duration of the Construction Phase and will ensure no significant dust related impacts occur on nearby sensitive receptors including local faunal species:

- Haulage vehicles transporting gravel and other similar materials to Site will be covered by a tarpaulin or similar.

- Bowsers will be available during periods of dry weather throughout the construction period.
- During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil thereby reducing the amount of dust.
- Stockpiles will be stored in sheltered areas of the Site, covered, and watered regularly or as needed if exposed during dry weather.
- Gravel will be used at Site exit points to remove caked-on dirt from tyre tracks.
- Equipment will be washed at the end of each workday.
- If practical, wheel-washing facilities will be located at all exits from the Construction Site.
- Dust production as a result of Site activity will be minimised by regular cleaning of the Site access roads using vacuum road sweepers and washers. Access roads will be cleaned at least 0.5km on either side of the approach roads to the access points.
- Public roads outside the Site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris.
- The frequency of cleaning will be determined by the Site agent and is weather and activity dependent.
- The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following will be dampened during dry weather:
    - Unpaved areas subject to traffic and wind
    - Stockpiles
    - Areas where there will be loading and unloading of dust-generating materials.

14.9.2 Operational Phase Mitigation

14.9.2.1 Wildlife friendly lighting

To minimise disturbance to bats in the immediate vicinity of the Site, the lighting and layout of the Proposed Development has been designed to minimise light spill. This will be achieved by ensuring that the design to minimise light spill. This will be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers 'Bats and Lighting in the UK - Bats and Built Environment Series', the Bat Conservation Trust ‘Artificial Lighting and Wildlife Interim Guidance’ and the Bat Conservation Trust 'Statement on the impact and design of artificial light on bats'.

Bat-friendly lighting measures have been incorporated into the Proposed Development design and associated lighting plan. Dark buffer zones can be effectively used to separate important habitats or features from lighting by forming a dark perimeter around them (ILP, 2018). Buffer zones rely on ensuring light levels within a certain distance of features do not exceed certain defined limits, generally 1 lux or less. The buffer zone can be further subdivided into zones of increasing illuminance limit radiating away from the feature.

It is noted that the Site is currently well illuminated due to the adjacent street and residential lighting, however the inclusion of wildlife friendly lighting measures in the Proposed Development design will have a considerable input in mitigating the potential impact of additional night-time lighting on local bats. Based on the above guidance documents, the lighting scheme for the Proposed Development, as confirmed by Morley Walsh has incorporated the following measures:

- Luminaires will have zero upward light ratio, to minimize light pollution, energy waste and impact on wildlife.
- Lighting will be directional on to the roadways and footways only with minimal spillage onto the adjoining habitats.
- LED luminaries are utilised where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability.
- Narrow spectrum bulbs will be used to lower the range of species affected by lighting. Light sources that emit minimal ultra-violet light and avoid the white and blue wavelengths of the light spectrum will be utilised to avoid attracting lots of insects. Lighting regimes that attract lots of insects result in a reduction of insects in other areas like parks and gardens that bats may utilise for foraging.
- Motion sensor and timer activated lighting will be in place at the Site to ensure minimal light spill occurs during the hours of darkness.
- Planting will provide areas of darkness suitable for bats to feed and commute.
- Reflective surfaces will not be placed under lights.

14.9.2.2 Protection and enhancement of habitats

The landscaped sections of the Proposed Development will be managed in a way so as to mitigate the loss of the existing hedgerows and treelines as much as is possible. In this way new hedgerows and treelines will be maximised in the ecological value they provide at the Site, with habitat connectivity ensured along the margins of the Proposed Development. This connectivity is vital for wildlife such as birds, bats, mammals, and insect pollinators in a human landscape such as that which will be provided by the Proposed Development. Additionally, by managing hedgerows and treelines in a more natural way, they will provide more in terms of biodiversity; through increased plant diversity, increase provision of food resources and higher quality shelter to wildlife inhabiting and commuting through the area.

This low intervention approach may not be suitable for the more landscaped areas of the Site, which may need to be maintained to a higher degree for health and safety or aesthetic reasons. However, a high quantity of native species is included in the landscape design in these locations to maximise the biodiversity value of these internal landscaped parts of the Site.

For the hedgerows running along the margins of the Site, the following management approach is proposed to maximise their biodiversity value and offset the loss of existing hedgerows and treelines at the Site:

- Hedgerows will be maintained with a natural meadow strip of 1-2m at their base wherever possible. Hedges with plenty of naturally occurring flowers and grasses at the base support will provide higher quality habitat for local wildlife using the hedges.
- The 1-2m strip at the base of the hedgerow will be cut on a reduced mowing regime to encourage wildflower growth and maximise the value of the hedgerow for pollinators. A two-cut management approach is ideal for suppressing coarse grasses and encouraging wildflowers. Cut the hedgerow basal strip once during February and March (this is before most verge plants flower and it will not disturb ground-nesting birds). Cut the verge once again during September and October (this slightly later cutting date allows plants that were cut earlier in the year time to grow and set seed).
- N.B. Raising the cutter bar on the back cut will lower the risk to amphibians, reptiles and small mammals.
- Hedgerows, where possible, should be allowed to reach at least 2.5m in height, and should be trimmed in an A-shape; maintaining a wider base to compliment the natural meadow strip at their base.
- Where hedgerow trimming needs to occur delay trimming as late as possible – until January and February as the surviving berry crop will provide valuable food for wildlife. The earlier this is cut; the less food will be available to help birds and other wildlife survive through the winter. Any hedgerow cutting should be done outside of the nesting season and due consideration of the Wildlife Act 1976 (as amended) needs to be taken.
- Where possible, cut these outer boundary hedgerows on a minimum 3-year cycle (cutting annually stops the hedgerow flowering and fruiting), and cut in rotation rather than all at once - this will ensure some areas of hedgerow will always flower (blackthorn in March, hawthorn in May).
- Where they occur naturally, bramble and ivy should be allowed grow in hedgerows, as they provide key nectar and pollen sources in summer and autumn.

<u>Methods to Avoid</u>

- Hedgerows will not be over-managed. Tightly cut hedges mean there are fewer flowers and berries, thus reducing available habitats, feeding sources and suitable nesting sites.
- Hedgerows will not be cut between March 1st and August 31st inclusive. It is both prohibited (except under certain exemptions) and very damaging for birds as this is the period they will have vulnerable nests containing eggs and young birds.
- Do not use pesticide/ herbicide sprays or fertilisers near hedgerows, scrub or areas of wildflower meadows as they can have an extremely negative effect on the variety of plants and animals that live there.

14.9.2.3 Bird and bat box scheme

14.9.2.3.1 Birds

It is recommended that 10 no bird boxes will be installed as part of the landscape plan, the placement of the bird boxes will be overseen by an appropriately qualified ecologist. The boxes will be durable and will be firm and secure to their supports, and only placed on trees that are robust and large enough to support the bird box.

- There are various standard bird box options and at least two of each of the following box types will be installed:
- 'Hole type' bird box (32mm hole) – for example the rookery nest box, which can be found at the following link - https://birdwatchireland.ie/product/tom-chambers-rookery-nest-box/.
- 'Hole type' bird box (32mm hole) for example the Schwegler nest box, which can be found at the following link - https://www.nhbs.com/1b-schwegler-nest-box?bkfno=174761
- Eco Starling Nest Box – which can be found at the following link - https://www.nestbox.co.uk/products/eco-starling-nest-box.
- 'Hole type' bird box (28 mm hole) – for example the Eco Small Bird Box, which can be found at the following link - https://www.vivara.ie/woodstone-seville-28mm-nest-box-brown.

Hole type bird boxes should be positioned 2-4m off the ground, with good-visibility, a clear flight line and away from the prevailing wind direction. Unless the areas are very sheltered, bird boxes should be fixed facing between north and south-east to avoid the hot sun and the wettest winds. Bird box placement will be directed by an ecologist and amended as appropriate.

14.9.2.3.2 Bats

It is recommended that 10 Schwegler bat boxes will be erected on suitably large trees along the Site boundaries to provide future roosting opportunities. The guidance of a suitably qualified ecologist will be sought in the selection of bat box type and placement; to avoid disturbance from lighting generated by the Proposed Development and maximise the likelihood of their uptake by local bats. Bat boxes will be placed over 4m high (if possible) onto mature trees, the trees in which they are placed will not be illuminated. A group of 3 bat boxes facing in different directions will provide a variety of micro-habitats.

14.9.2.4 Hedgehog highways

By creating a number of separate private dwellings and associated gardens at the Site, large areas of the Site ultimately become fragmented and potentially inaccessible to species such as hedgehogs, which like to roam each night in search of food (garden pests e.g., slugs). This can be mitigated by ensuring that the boundaries and barriers within and surrounding the Site i.e., garden fencing, railings and gates are permeable for hedgehogs (Figure 14.14). This can be done by:

- The use of fence panels with 13 x 13 cm holes at ground level (hedgehog holes).
- Leaving a sufficient gap beneath gates.
- Leaving brick spaces at the base of brick walls.

A variety of fence suppliers' stock specific hedgehog-friendly fencing options, which can be easily incorporated at little to no additional costs. These simple measures will provide habitat connectivity at the Site for small mammals and reduce the impact of the land-use change on these species. Including details of hedgehog-friendly features in the new homeowner's welcome pack will raise awareness and prevent homeowners from reversing these features, for instance blocking fence holes.

Figure 14.14. Example of 'hedgehog highway' that can maintain habitat connectivity for hedgehogs in residential developments (image: BHPS guidance document).

14.10 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. Potential residual impacts from the Proposed Development were considered as part of this environmental assessment. Table 14.14 provides a summary of the impact assessment for the identified KERs and details the nature of the impacts identified, mitigation proposed and the classification of any residual impacts.

The hedgerow and treeline habitats on Site were noted to be gappy with a sparse understorey, however they provide potential nesting, resting, foraging and commuting habitat for local bird and bat populations as well as small mammals (hedgehog and pygmy shrew). The loss of these KER habitats will be offset to a degree by the provision of new, predominantly native hedge and tree planting in the landscape plan for the Proposed Development.

All mitigation measures detailed in this Chapter will be implemented in full and will remain effective throughout the lifetime of the Proposed Development. Therefore, **no significant negative residual impacts** on the local ecology or on any designated nature conservation sites will result from the Proposed Development.

Table 14.14. Summary of potential impacts of KERs, mitigation measures and residual impacts.

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
Designated sites								
Royal Canal pNHA	Local Importance (higher value)	Potential impacts to underlying groundwater body during the Construction Phase	Negative	Site scale	Short-term	Slight	Surface water protection measures outlined in Section 14.9.	No impact
Habitats								
Hedgerows (WL1) & treelines (WL2)	Local Importance (higher value)	Loss of habitats at the Site, offset to a degree by the landscaping plan (incl. green spaces with mix of native and non-native planting). Trampling and damage of retained habitats during the Construction Phase.	Negative	Site scale	Long-term	Moderate	No further mitigation proposed for loss of habitat. With time, the maturing planted trees and hedgerows will neutralise the effects of habitat loss. Retention and protection of seven trees, 95.3m of hedgerow and 95m of scrub at the Site. Tree protection measures as outlined in Section 14.9.1.1.	*Negative, permanent, Slight* impact at a local scale. Imperceptible.

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
Fauna								
Small mammals (hedgehog and pygmy shrew)	Local Importance (higher value)	Risk of injury and/or death as a result of vegetation clearance works and Site management. Disturbance during the Construction Phase. Disturbance during the Operational Phase.	Negative	Site scale	Short-term Short-term Long-term	Significant Slight Moderate	Vegetation clearance to take place between September and October and working in consistent manner. Good Site hygiene and tidiness to ensure no entrapment of small mammals. Wildlife friendly lighting measures as outlined in Section 14.9. The inclusion of hedgehog highways (Section 14.9.2.4).	Imperceptible.
Bird assemblages	Local Importance (higher value)	Disturbance/harm as a result of vegetation clearance during the breeding bird season Loss of suitable foraging/nesting habitat at the Site offset to some	Negative	Site scale	Permanent	Significant	No removal of vegetation to be carried out during the breeding bird season. 10 bird boxes will be erected in suitable areas throughout the Site.	Imperceptible.

Key Ecological Resource	Level of Significance	Potential Impact	Impact Without Mitigation				Proposed Mitigation/ Compensation/ Enhancement measures; Mitigating Factors	Residual Impact
			Quality	Magnitude / Extent	Duration	Significance		
		degree by the Proposed Landscape design. Disturbance during the Construction Phase.			Permanent Short-term	Moderate Slight	No further mitigation proposed for loss of habitat. With time, the landscape design will neutralise the effects of habitat loss. Construction related noise and dust control/minimisation measures to be implemented.	
Bat assemblages	Local Importance (higher value)	Loss of suitable foraging / commuting habitat at the Site offset to some degree by the Proposed Landscape design and the retention of the treeline at the northeast of the Site. Disturbance to commuting / foraging routes due to increased lighting at the Site.	Negative	Site scale	Long-term Short-term	Moderate Slight	10 bat boxes will be erected on Site. No further mitigation proposed for loss of habitat. With time, the landscape design will neutralise the effects of habitat loss. Bat friendly lighting measures to be implemented.	Imperceptible.

14.11 Significant Interactions

This chapter pertaining to the ecological and biodiversity aspects of the Proposed Development, has the potential to interact with aspects of the following chapters of this EIAR.

14.11.1 Chapter 5 – Land, Soils & Geology

An assessment of the potential impact of the Proposed Development on the existing land, soils and geological environment; with emphasis on the impact of the Proposed Development on the receiving soils underlying the Site during the Operational Phases of the Proposed Development, is described in Chapter 5 - 'Land and Soil' of this EIAR. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are described in full in Chapter 5. The bulk removal of soils, sands and gravel at the Site can have implications for biodiversity. Natural regeneration of native and local seeds is the preferred option for re-vegetating areas to be retained for biodiversity.

14.11.2 Chapter 6 - Hydrology & Hydrogeology

The key environmental interaction with biodiversity is water. An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is described in Chapter 6 - 'Hydrology' of this report as well as in his Chapter, to ensure the quality (pollution and sedimentation) and quantity (surface water run-off) of water is of appropriate standard. Interactions between hydrology and biodiversity can occur through impacts to water quality, arising, for example from an accidental pollution event during the Construction and Operational Phase.

14.11.3 Chapter 7 - Air Quality

An assessment of the potential impact of the Proposed Development on air quality is included in Chapter 7 of this EIAR. Dust emissions arising from the Construction Phase of the Proposed Development were identified as having potential impacts on local biodiversity. Once dust minimisation measures are implemented, impacts to biodiversity are not predicted to be significant.

14.11.4 Chapter 9 - Noise & Vibration

An assessment of the potential impact of the Proposed Development in the form of excess noise and vibrations associated with the Proposed Works are laid out in Chapter 9 - 'Noise and Vibrations'. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 9. There is potential for interactions between noise and sensitive fauna, e.g., birds, that occur in adjacent habitats from increased noise levels during the Construction Phase. However, as described, noise related impacts are not deemed to be significant.

14.11.5 Chapter 10 - Landscape and Visual Impact Assessment

An assessment of the potential impacts of the Proposed Development on the surrounding landscape character is outlined in Chapter 10 – Landscape and Visual. These impacts are considered to be relevant to the ecological sensitivities associated with the Site of the Proposed Development discussed in this Chapter; and mitigation measures addressing these potential impacts are both referenced in this Chapter and described in full in Chapter 10. Landscaping at a development site can have significant implications for biodiversity. The landscape plan for the Proposed Development includes a high quantity of native species including hedgerows, treelines and wildflower meadows. The lighting plan for the Site has also been sensitively designed to protect bats from light pollution. Significant negative effects are not predicted.

14.11.6 Chapter 11 - Material Assets: Waste

Construction waste arising from Site operations could negatively affect local fauna through entrapment, for example. However, appropriate waste management practices on Site will ensure no significant effects occur on local biodiversity.

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Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 15

Cultural Heritage & Archaeology

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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15 Cultural Heritage & Archaeology

15.1 Introduction

This chapter of the EIAR was prepared to assess the potential significant effects of the proposed development on the cultural heritage resource. This resource encompasses several aspects of tangible assets including archaeological sites, monuments and artefacts, architectural heritage structures, including their associated curtilages, industrial and vernacular heritage as well as intangible assets such as folklore, oral tradition, historical associations and language.

The assessment is based on programmes of desktop research, field inspections and the results of a programme of archaeological test trenching which was carried out as part of an Archaeological Impact Assessment prepared for a previous planning application within the proposed development site (Westmeath Co. Council (WCC) ref. 21/139).

The chapter should be read in conjunction with Appendix 15.1, which contains a report on the results of the programme of archaeological test trench investigations in the fields within the proposed development site (Dunne 2020, Licence ref. 20E0255).

15.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Tony Cummins of John Cronin and Associates.

Mr. Cummins is a professional archaeologist with 28 years' experience and holds primary and post-graduate degrees in archaeology (B.A. 1992 and M.A. 1994, University College Cork). He has extensive experience in the preparation of cultural heritage and archaeological impact assessments for proposed residential developments and was involved in the preparation of EIARs for the following projects:

- Ballinglanna Residential Development, Glanmire, Co. Cork
- Golf Links Road Residential Development, Ennis, Co. Clare
- Rathgowan Residential Development, Mullingar, Co. Westmeath

15.3 Proposed Development

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

15.3.1 Aspects Relevant to this Assessment

The construction phase of the proposed residential development will require the removal of the topsoil layer and the excavation of foundations and other infrastructure within the underlying natural subsoil. These types of ground works have the potential to result in direct negative effects on aspects of the cultural heritage resource such as sub-surface archaeological features.

15.4 Methodology

15.4.1 Study Area

The study area reviewed as part of the assessment comprised the area within the proposed development site and the lands extending for 500m in all directions from its boundary. The review of this study area facilitated an appraisal of the baseline cultural heritage environment of the location of the proposed development site and its environs and informed the assessment of potential direct impacts on identified constraints or indirect impacts on their settings.

15.4.2 Relevant Legislation & Guidance

The guidelines relevant to the assessment include the *Architectural Heritage Protection: Guidelines for Planning Authorities* (Department of Arts, Heritage and Gaeltacht 2011) and the *Framework and Principles for the Protection of Archaeological Heritage* (Department of Arts, Heritage, Gaeltacht and the Islands 1999). The assessment was also informed by the Environmental Protection Agency (EPA 2022) *Guidelines for Information to be Contained in EIAR* and the International Council on Monuments and Sites (ICOMOS 2011) *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties*.

The National Monuments Service (NMS), which is currently based in the Department of Housing, Local Government and Heritage, is responsible for the protection of Ireland's archaeological heritage.

The following sections presents summaries of the legal and planning policy frameworks relevant to this assessment in order to provide a context for the statutory protection assigned to the cultural heritage resource. The management and protection of cultural heritage in Ireland is achieved through a framework of national laws and policies which are in accordance with the provisions of the Valetta Treaty (1995) (formally the European Convention on the Protection of the Archaeological Heritage, 1992) ratified by Ireland in 1997; the Granada Convention (1985) (formally the European Convention on the Protection of Architectural Heritage), ratified by Ireland in 1997; and the UNESCO Convention for the Safeguarding of the Intangible Cultural Heritage, 2003, ratified by Ireland in 2015. The locations of World Heritage Sites (Ireland) and the Tentative List of World Heritage Sites submitted by the Irish State to UNESCO were reviewed and none are located within the environs of the study area.

15.4.2.1 Archaeological Legislation and Planning Polices

The National Monuments Act 1930 (as amended), the Heritage Act 1995 (as amended) and relevant provisions of the National Cultural Institutions Act 1997 are the primary means of ensuring the satisfactory protection of archaeological remains. There are a number of mechanisms under the National Monuments Act (as amended) that are applied to secure the protection of archaeological monuments. These include the designation of National Monument status for sites of national significance, the Register of Historic Monuments (RHM), the Record of Monuments and Places (RMP), the Sites and Monuments Record (SMR), and the placing of Preservation Orders and Temporary Preservation Orders on endangered sites.

Section 2 of the National Monuments Act, 1930 defines a National Monument as 'a monument or the remains of a monument, the preservation of which is a matter of national importance'. The State may

acquire or assume guardianship of examples through agreement with landowners or under compulsory orders. Archaeological sites within the ownership of local authorities are also deemed to be National Monuments. The prior written consent of the Minister is required for any works at, or in proximity to, a National Monument or at sites which are subject to a Preservation Order. There are no National Monuments in State Care or archaeological sites assigned Preservation Orders located within the study area.

The RMP was established under Section 12(1) of the National Monuments (Amendment) Act, 1994 and was based on the earlier SMR and RHM. It comprises lists and maps of archaeological monuments and places for each county in the State and all listed archaeological sites receive statutory protection under the National Monuments Act 1994. No works can be undertaken at their locations or within their surrounding designated Zones of Notification without providing two months advance notice to the NMS. There are no recorded archaeological sites located within the proposed development site while there is one example, which no longer remains extant, located within 500m of its boundary (See Section 15.6).

The County Westmeath Development Plan 2021-2027 includes the following relevant objectives in relation to the protection of the archaeological resource within the county:

- CPO 14.5: Seek to ensure the protection and sympathetic enhancement of archaeological heritage, and in this regard, applications will be referred to the National Monuments Service, Department of Culture, Heritage & the Gaeltacht for comment.
- CPO 14.6 Seek to ensure the protection of archaeological sites and monuments and their settings and archaeological objects that are listed in the Record of Monuments and Places, in the ownership/guardianship of the State, or that are the subject of Preservation Orders or have been registered in the Register of Historic Monuments. Seek to ensure the protection and preservation of archaeological sites, which have been identified subsequent to the publication of the Record of Monuments and Places.
- CPO 14.7 Ensure that any development adjacent to an archaeological monument or site shall not be detrimental to the character of the archaeological site, or its setting and shall be sited in a manner which minimises the impact on the monument and its setting. Development which is likely to detract from the setting of such a monument or site will not be permitted.

The Mullingar Local Area Plan 2014-2020 as extended includes the following policies and objectives in relation to the protection of the archaeological resource within the town:

- P-ARC1: To protect the archaeological heritage of the town in accordance with Departmental Guidelines
- P-ARC2: To strictly control development that may be detrimental to any feature or site of archaeological significance or that may seriously detract from the interpretation and setting of these sites.
- P-ARC3 To protect and retain surviving medieval plots and street patterns in the town.
- P-ARC4: To ensure that all sites of archaeological potential are protected from development that may injure any potentially important archaeological features or sites.
- O-ARC2: To provide guidance to developers in relation to proposals for development that may potentially impact upon the archaeological heritage, drawing their attention to additional

published government guidance available such as 'Framework and Principles for the Protection of the Archaeological Heritage' (1999)

- O-ARC3: To require, where appropriate, that an Archaeological Assessment be carried out by a suitably qualified person prior to the commencement of any activity that may impact upon the archaeological heritage.
- O-ARC5 To impose conditions on development that will affect sites of archaeological potential to ensure that appropriate measures are taken for the identification and mitigation of the archaeological impacts, including a licensed excavation and recording of remains prior to commencement of development where appropriate.

15.4.2.2 Architectural Heritage Legislation and Planning Policies

Protection of architectural heritage is provided for through a range of legal instruments that include the Planning and Development Act 2000 (as amended). The Heritage Act 1995 (as amended) and the Architectural Heritage (National Inventory) and National Monuments (Misc. Provisions) Act 1999. The Planning and Development Act 2000 requires all Planning Authorities to keep a 'Record of Protected Structures' (RPS) of special architectural, historical, archaeological, artistic, cultural, scientific, social or technical interest. As of the 1st of January 2000, all structures listed for protection in current development plans, have become 'protected structures'. Since the introduction of this legislation, planning permission is required for any works to a protected structure that would affect its character. A protected structure also includes the land and other structures within its curtilage. While the term 'curtilage' is not defined by legislation, the *Architectural Heritage Protection Guidelines for Local Authorities* (Department of Arts, Heritage and the Gaeltacht 2011), describes it as the parcel of land immediately associated with a structure and which is (or was) in use for the purposes of the structure. In addition, local authorities must provide for the preservation of places, groups of structures and townscapes of architectural heritage significance through the designation of Architectural Conservation Areas (ACAs).

The National Inventory of Architectural Heritage (NIAH) was established to record architectural heritage structures within the State and while inclusion in the NIAH does not provide statutory protection listing in the inventory is a signifier of architectural heritage value and it is intended to advise local authorities on compilation of their Record of Protected Structures. The NIAH also includes a Survey of Historic Gardens and Landscapes which comprises a non-statutory, desk-based survey of such features.

Details on the Protected Structures and NIAH-listed features within the study area are provided in Section 15.6 of this chapter.

The County Westmeath Development Plan 2021-2027 presents a number of objectives to ensure the protection of the architectural heritage resource within the County and these include:

- CPO 14.27 Protect and conserve buildings, structures and sites contained in the Record of Protected Structures and to encourage the sympathetic re-use and long-term viability of such structures without detracting from their special interest and character.
- CPO 14.28 Protect the architectural heritage of Westmeath through the identification of Protected Structures, the designation of Architectural Conservation Areas (ACAs), the

safeguarding of designed landscapes and historic gardens, and the recognition of structures and elements that contribute positively to the vernacular and industrial heritage of the County.

- CPO 14.44 Encourage the retention and appropriate re-use of vernacular buildings, including vacant traditional farm buildings, where appropriate and encourage the retention of the original fabric such as windows, doors and other significant features of historic buildings.

The Mullingar Local Area Plan 2014-2020 as extended includes the following policies in relation to the protection of the architectural resource within the town:

- P-BH1: To protect and conserve buildings, structures and sites contained in the Record of Protected Structures and to resist the demolition of such structures in accordance with 'Architectural Heritage Protection Guidelines for Planning Authorities'
- P-BH2: To prevent forms of development that would be injurious to the town's architectural and archaeological heritage.
- P-BH3To preserve and protect Mullingar's built environment in terms of streetscapes, individual buildings and features of historical, architectural or artistic interest.
- P-BH 4: To resist the demolition of vernacular architecture of historical, cultural and aesthetic merit, which make a positive contribution to the character, appearance and quality of the local streetscape.
- P-BH5: To secure the protection of the architectural heritage value and historic built fabric of Columb Barracks and St. Loman's Hospital, in accordance with the provisions of Part IV of the Planning and Development Acts 2000 as amended.
- P-BH6: To promote and facilitate the regeneration and redevelopment of Columb Barracks and St. Loman's Hospital, in a manner consistent with an agreed framework for these strategic sites.
- P-BH7 To protect the character of designated Architectural Conservation Areas (ACAs) including the public realm area associated therewith and to resist inappropriate development that would detract from the heritage value of these areas.

15.4.3 Desktop Research

Documentary research was carried out on the recorded and potential cultural heritage resource within a study area encompassing the lands within the proposed development site as well as lands extending for 500m in all directions from its boundary. This was carried out in order to identify any recorded archaeological, architectural and other cultural heritage constraints within this area and facilitated an evaluation of the potential presence of unrecorded cultural heritage sites or features within the proposed development site.

The principal sources reviewed for the assessment of the recorded archaeological resource were the Sites and Monuments Record (SMR) and the Record of Monuments and Places (RMP) maintained by the Department of Housing, Local Government and Heritage. The current Record of Protected Structures (RPS) for County Westmeath and the National Inventory of Architectural Heritage (NIAH), including the NIAH Building and Garden Surveys were reviewed in order to assess the designated architectural heritage resource within the study area.

Other sources consulted as part of the programme of desktop research comprise the following:

- *Development Plans*: The County Westmeath Development Plan 2017-2023 and the Mullingar Local Area Plan 2014-2020 (as extended) were consulted as part of this assessment. These publications identify buildings listed in the Record of Protected Structures, Architectural Conservation Areas and detail the Council's policies and objectives for the protection of the archaeological and architectural heritage resource.
- *Database of Irish Excavation Reports:* This online database contains summary accounts of licensed archaeological site investigations carried out in Ireland (North and South) from 1970 to present. Current data was accessed via www.excavations.ie in May 2023.
- *Literary Sources*: Various published literary sources were consulted in order to assess the archaeological, historical, architectural heritage and folklore record of the study area and these are listed in Section 15.13 of this chapter.
- *Archaeological Survey of Ireland*: While there is no published archaeological inventory for County Westmeath, the National Monuments Service's online Historical Environment Viewer (www.archaeology,ie) presents inventory descriptions compiled by the Archaeological Survey of Ireland for a range of known archaeological sites within the county.
- *Historic Maps*: The detail on historic maps sources can indicate the presence of past settlement activity, including features of potential archaeological and architectural heritage significance that no longer have any surface expression. Available cartographic sources dating from the 17th century onward were reviewed and relevant extracts are presented in Section 15.6 of this chapter.
- *Aerial/Satellite Imagery*: A review of available online aerial and satellite images of the study area was undertaken in order to ascertain if any traces of unrecorded archaeological sites were visible.
- *LiDAR Imagery*: The proposed development is within the coverage area of Office of Public Works (OPW) LiDAR data which has been published online by the Geological Survey Ireland. This form of imagery has the potential to reveal the presence of archaeological sites with low surface expression and was reviewed as part of the assessment.
- *Irish Heritage Council: Heritage Map Viewer*: This online mapping resource (www.heritagemaps.ie) is a spatial data viewer which collates various cultural heritage datasets sourced from, among others, the National Monuments Service, National Museum of Ireland, local authorities, the Royal Academy of Ireland and the Office of Public Works.
- *National Museum of Ireland Topographical Files*: These files comprise a written and digital archive which records known information in relation to the discovery locations of Irish archaeological artefacts, including those held in the museum's collection. The files are archived in the museum's premises in Kildare Street, Dublin and were inspected as part of the desktop study. The archive contains no files recording the discovery of artefacts within the environs of the proposed development site.
- *Irish National Folklore Collection*: Transcribed material from the National Folklore Collection archive has been digitised and published online at www.duchas.ie.
- *Placenames Database of Ireland*: This online database (www.logainm.ie) provides a comprehensive management system for data, archival records and placenames research conducted by the State.

- *UNESCO designated World Heritage Sites and Tentative List*: There are two World Heritage Sites in Ireland (Brú na Bóinne and Sceilg Mhichíl) and a number of other significant sites are included in a Tentative List was put forward by Ireland for consideration in 2022.
- *Westmeath Industrial Heritage Survey*: This desk-based survey was carried out on behalf of Westmeath County Council and the Heritage Council of Ireland and seeks to record the industrial heritage of the county. A review of the locations of recorded industrial sites was carried out as part of the assessment.

15.4.4 Field Survey

A field-walking survey of all areas of the proposed development site was carried out to assess the lands in terms of modern land use, vegetation cover and the potential for the presence of previously unrecorded archaeological sites or structures of architectural heritage interest. The field survey results are described within Section 15.2.4 of this chapter.

15.4.5 Archaeological Test Trenching

All of the fields within the boundary of the proposed development were subject to a programme of archaeological test trenching in 2020 (Dunne 2020, Licence ref. 20E0255). This site investigation was carried out as part of an Archaeological Impact Assessment prepared for a previous planning application within the proposed development site (Westmeath Co. Council (WCC) ref. 21/139). The only identified feature of archaeological potential within the fields was a single pit feature of unknown date located in the southeast area. The Archaeological Impact Assessment Report recommended that this pit feature should be subject to a full archaeological excavation in advance of the construction phase. The Notification of Decision issued by WCC for the application included a condition (No. 10) stating that the developer should carry out the recommendations set out in the Archaeology Report submitted as part of the application. A copy of the full test trenching report is provided in Appendix 15.1.

15.4.6 Assessment of Impacts

The methodology used for the assessment of potential impacts has been informed by the Environmental Protection Agency (EPA 2022) *Guidelines for Information to be Contained in EIAR*, in accordance EIA requirements of codified EU Directive 2011/92/EU as amended by EU Directive 2014/52/EU, per current Planning Legislation, concerning EIA assessment: Planning and Development Act, 2000 (as amended) (Part X) and in Part 10 of the Planning and Development Regulations, 2001 (as amended).

The following summation of the criteria used to assess impacts is provided in order to concisely outline the methodology specifically applied to the cultural heritage resource. Assessment is achieved by a consideration of the duration, quality, type, value and magnitude of effect(s) on the cultural heritage resource:

Duration of Effect is assessed based on the following criteria:

- Momentary (seconds to minutes)
- Brief < 1 day

- Temporary <1 year
- Short-term 1-7 years
- Medium Term 7-15 years
- Long Term 15-60 years
- Permanent > 60 years
- Reversible: Effects that can be undone, for example through remediation or restoration.

The *Quality of Effect* on the cultural heritage resource can be positive, neutral or negative.

- Positive: a change which improves the quality of the cultural heritage environment (e.g. increasing amenity value of a site in terms of managed access, signage, presentation etc. or high-quality conservation and re-use of an otherwise vulnerable derelict structure).
- Neutral: no change or effects that are imperceptible, within the normal bounds of variation for the cultural heritage environment.
- Negative: a change which reduces the quality of the cultural heritage resource (e.g., visual intrusion on the setting of an asset, physical intrusion on features/setting of a site)

The *Type of Effect* on the cultural heritage resource can be direct, indirect or no predicted impact.

- Direct: where a cultural heritage site is physically located within the footprint of the proposed development, which will result in its complete or partial removal.
- Indirect: where a cultural heritage site or its setting is located in close proximity to the footprint of the proposed development.
- None predicted: where the proposed development will not adversely or positively affect a cultural heritage site.

The *Magnitude of Effect* is based on the degree of change, incorporating any mitigation measures, and is based on a consideration of the character, duration, probability and consequences (Table 15.1). The magnitude can be negative or positive and is ranked without regard to the value of the asset according to the following scale: High; Medium; Low and Negligible. The descriptions of magnitudes presented in Table 15.1 are based on guidance published in *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011, 16-7).

Table 15.1 Magnitudes of Effect on Cultural Heritage Assets

Magnitude		Description
High		Most or all key archaeological or architectural materials affected such that the resource is totally altered. Comprehensive changes to setting. Changes to most or all key historic landscape elements, parcels or components; extreme visual effects; fundamental changes to use or access; resulting in total change to historic landscape character. Major changes to area that affect Intangible Cultural Heritage activities or associations or visual links and cultural appreciation

Magnitude		Description
Medium		Changes to many key archaeological or historic building materials/elements such that the resource is clearly/significantly modified. Considerable changes to setting that affect the character of the archaeological asset. Changes to the setting of a historic building, such that it is significantly modified. Change to many key historic landscape elements, parcels or components, visual change to many key aspects of the historic landscape, considerable changes to use or access, resulting in moderate changes to historic landscape character. Considerable changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Low		Changes to key archaeological materials/historic building elements, such that the resource is slightly altered/slightly different. Slight changes to setting of an archaeological monument. Change to setting of a historic building, such that it is noticeably changed. Change to few key historic landscape elements, parcels or components; slight visual changes to few key aspects of historic landscape; slight changes to use or access; resulting in limited change to historic landscape character. Changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.
Negligible		Very minor changes to key archaeological materials or setting. Slight changes to historic building elements or setting that hardly affect it. Very minor changes to key historic landscape elements, parcels or components; virtually unchanged visual effects; very slight changes to use or access. Very minor changes to area that affect the Intangible Cultural Heritage activities or associations or visual links and cultural appreciation.

Value Assessment

While various legal designations exist for elements of the Irish cultural heritage resource (see Section 15.4.2), there are currently no formal criteria for grading the values of individual elements of this resource. The National Inventory of Architectural Heritage (NIAH) does apply a ranking system (Regional, National and International) to structures included in that inventory and, while these rankings do not confer a graduated level of protection they have been utilised as a value indicator for NIAH-listed structures for the purpose of assessment.

Given the absence of formal value criteria or guidelines, the evaluations used in this assessment have been informed by guidelines presented in the *Guidance on Heritage Impact Assessments for Cultural World Heritage Properties* (ICOMOS 2011). The evaluation of the values of cultural heritage assets is

not intended as definitive but rather as an indicator which contributes to a wider judgment based the individual circumstances of each asset. The application of values included a consideration of their legal designations (e.g., National Monuments), condition / preservation; historical significance, group value, rarity, visibility in the landscape, fragility/vulnerability and amenity value on a case-by-case basis. It is noted that archaeological monuments, whether extant or levelled, have the potential to possess sub-surface attributes, such as artefacts, human burials or other archaeological remains, that may possess values that cannot be discerned without recourse to archaeological excavation but are unlikely to be affected in the absence of direct negative impacts. The value of all known or potential assets that may be impacted by development are ranked according to the following scale as defined by ICOMOS: Very High; High; Medium; Low, Negligible, Unknown (Table 15.2). The values assigned to relevant cultural heritage assets within the area were determined following the completion of the desktop research combined with subsequent site inspections and are outlined in Section 15.6.9.

Table 15.2 Indicative Factors for Assessing the Value of Cultural Heritage Assets

Value	Description
Very High	World Heritage Sites (including Tentative List properties). Sites, buildings or landscapes of acknowledged international importance. Intangible associations with individuals or innovations of global significance.
High	Nationally designated sites, buildings and landscapes of significant quality, rarity, preservation and importance. Undesignated assets of the quality and importance to be designated. Assets that can contribute significantly to acknowledged national research objectives. Archaeological Landscapes with significant group value. Intangible associations with individuals or innovations of national significance.
Medium	Designated or undesignated assets that can contribute significantly to regional research objectives, including buildings that can be shown to have exceptional qualities in their fabric or historical associations. Conservation Areas and historic townscapes containing buildings that contribute significantly to its historic character. Intangible associations with individuals or innovations of regional significance.
Low	Assets compromised by poor preservation and/or poor survival of contextual associations. Assets of limited value, but with potential to contribute to local research objectives. Historic Townscape or built-up areas of limited historic integrity in their buildings and settings. Intangible associations with individuals or innovations of local significance.
Negligible	Assets with very little or no surviving archaeological interest. Landscapes little or no significant historical interest. Buildings or urban areas of no architectural or historical note; buildings of an intrusive character.
Unknown	Assets whose importance has not been ascertained. Buildings with some hidden (i.e., inaccessible) potential for historic significance.

The *Significance of Effects* is assessed based on a consideration of the Magnitude of the Impact combined with the Value of the cultural heritage asset. The Significance can be described as Profound, Very Significant, Significant, Moderate, Slight, Not Significant or Imperceptible (Table 15.3 and Table 15.4).

Table 15.3 Significance of Effects (per EPA EIAR Guidelines 2022)

Significance	Description
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
Moderate	An effect that alters the character of the environment in a manner that is consistent with existing and emerging baseline trends
Significant	An effect which, by its character, magnitude, duration or intensity alters a sensitive aspect of the environment
Very Significant	An effect which, by its character, magnitude, duration or intensity significantly alters most of a sensitive aspect of the environment
Profound	An effect which obliterates sensitive characteristics

Table 15.4 Significance of Effects Matrix (per EPA EIAR Guidelines 2022)

Magnitude of Impact	**High**	Not Significant/ Slight	Moderate/ Significant	Significant/ Very Significant	Very Significant/ Profound
	Medium	Not Significant	Slight	Moderate/ Significant	Significant/ Very significant
	Low	Not Significant/ Imperceptible	Slight/ Not Significant	Slight	Moderate
	Negligible	Imperceptible	Not Significant/ Imperceptible	Not Significant/ Slight	Slight
		Negligible	**Low**	**Medium**	**High**
	Value/Sensitivity of the Asset				

15.4.7 Consultation

A Section 247 and a Section 32B meetings were held with the Council. No additional consultations were carried out for this chapter.

15.5 Difficulties Encountered

The were no limitations or difficulties encountered during the compilation of this assessment.

15.6 Baseline Environment

15.6.1 General Context

The proposed development site is located within the townland of Mullingar and is situated on the western outskirts of the modern suburbs of Mullingar town. It is occupied by two level, vacant pasture fields which are bound by the Mullingar Western Relief Road (R394) to the west and Ashe Road to the south with modern housing developments to the east, north and south.

15.6.2 Desktop Study

Relevant cultural heritage sources and datasets have been interrogated and retrieved from current state and local authority sources and are considered accurate at the time of writing in May 2023. The dating framework used for each period of the archaeological record is based on the framework presented in the *Guidelines for Authors of Reports on Archaeological Excavations* as published by the National Monuments Service (2006). The published inventory entries for recorded archaeological sites and designated architectural heritage structures within the study area are presented. Information acquired from other sources consulted during the desktop study is also presented, including published content, historic maps and aerial, satellite and LiDAR imagery.

15.6.2.1 Archaeological and Historical Context

There are no recorded archaeological sites located within the proposed development site while there is one example located within the surrounding 500m study area (Table 15.5 and Figure 15.1). A review of the current SMR, as published on the National Monument Service's online Historic Environment Viewer (www.archaeology.ie), revealed that it contains no records for the presence of any unlocated archaeological sites within the environs of the proposed development site.

Table 15.5 Recorded Archaeological Sites within the Study Area

Monument No.	Class	Townland	ITM E	ITM E	Distance from site
WM019-089003-	Standing Stone	Mullingar	642900	753343	230m to east

Figure 15.1 Location of recorded archaeological site (red dot) and designated architectural structures (yellow dots) within 500m study area (cyan line). The western end of the Zone of Archaeological Potential around Mullingar town is indicated in pink in bottom left corner.

Early Prehistoric Periods

Until the recent identification of Palaeolithic human butchery marks on animal bones recovered from cave sites which have been dated to the Palaeolithic period, the earliest recorded evidence for human activity in Ireland dated to the Mesolithic period (7000–4000 BC) when groups of hunter-gatherers lived on the heavily wooded island. The archaeological record indicates that these mobile groups favoured coastal, lake and river shores which provided a transport and food resource. They did not construct any settlements or monuments that have left any above ground traces although their presence in an area can often be identified by scatters of worked flints in ploughed fields or during earthmoving undertaken as part of development works. The Neolithic period (4000-2400 BC) began with the arrival and establishment of agriculture as the principal form of economic subsistence, which resulted in more permanent settlement patterns in farmlands within areas of cleared forestry. As a consequence of the more settled nature of agrarian life, new site-types, such as more substantial rectangular timber houses and various types of megalithic tombs, and artefacts such as pottery begin to appear in the archaeological record during this period. There are no recorded Mesolithic or Neolithic sites located within the study area.

Late Prehistoric Periods

The advent of the Bronze Age period (c. 2400–500 BC) in Ireland saw the introduction of a new artefactual assemblage, including metal and ceramic objects, to the island. This period was also associated with the construction of new monument types such as wedge tombs, standing stones, stone rows/circles and burnt mounds known as fulachta fia. The development of new burial practices during this period also saw the construction of funerary monuments such as cairns, barrows, boulder burials and cists. The arrival of iron-working technology in Ireland saw the advent of the Iron Age (c.c. BC – 400 AD). Relatively little has been known about Iron Age settlement and ritual practices until recent decades when the corpus of evidence has been greatly increased by the discovery of sites dating to this period during development projects. It is noted that while the vast majority of prehistoric settlement sites leave no above ground remains their foundations and occupation deposits, which may contain artefactual and environmental remains, can often survive below modern ground surfaces. The study area contains one recorded standing stone (WM019-089003-) but the Archaeological Survey of Ireland notes that this is likely a boundary feature of 19th century date and it is detailed in the below section relating to the post-medieval period. While there are no recorded late prehistoric sites within the study area a programme of archaeological excavations within a proposed development site on the opposite (west) side of the Mullingar Western Relief Road (R394) did reveal three pits with cremated human remains which were interpreted as being of likely Bronze or Iron Age date (see Table 15.6 below).

Early Medieval Period

The early medieval period began with the introduction of Christianity to Ireland and continued until the arrival of the Anglo-Normans in the late 12th century (c. 400–1169 AD). While this period saw the emergence of the first phases of urbanisation around the larger monasteries and the Hiberno-Norse ports, the dominant settlement pattern continued to be rural-based and founded on an agricultural economy centred on enclosed farmsteads known as ringforts. These are the most common early medieval sites within the Irish landscape and comprise circular enclosures delimited by earthen banks formed of material thrown up from a concentric external ditch. While there are ringforts located within the wider landscape around Mullingar town, there are no recorded examples, or other early medieval sites, within the study area.

Late Medieval and Post-Medieval Periods

The arrival of the Anglo-Normans in the late 12th century marks the advent of the Irish high medieval period which continued to c.1400 and was followed by the late medieval period which extended to c.1550. These periods saw the expansion of Irish urbanisation as many of the port cities developed into international trading centres and numerous villages and towns began to develop throughout the country, often within the environs of Anglo-Norman manorial centres which were defended by fortifications. By the 15th century the native Irish chieftains and lords began to construct tower-house castles within their own landholdings as centres of territorial control. There are no known archaeological sites dating to either period located within the study area and there is also little historical information on the settlement and land-use patterns within the study area during these periods. The proposed development site is located c.670m outside the western end of the Zone of Notification around the medieval core of Mullingar town, as designated by the National Monuments Service, and it likely formed part of the settlement's agricultural hinterland during this period.

The centuries following 1550 comprise the post-medieval period which continued into the middle of the 19th century and the period thereafter is often described as early modern. The first century of the post-medieval period was a turbulent time in Ireland history and saw a prolonged period of wars between the 1560s and 1603 with further conflicts arising during the Cromwellian Wars (1649–53). This period saw the extensive dispossession of forfeited Gaelic lands and the final disintegration of the Gaelic order in the early 17th century followed the Battle of Kinsale (1601), the conclusion of the Nine Years War (1603) and the Flight of the Earls (1607).

The post-medieval period saw the development of high and low status stone houses throughout the Irish countryside and rural settlement clusters at this time typically consisted of single-storey thatched cottages with associated farm buildings while two-storey farmhouses became more common as the 19th century progressed. An agricultural boom in the late 18th and early 19th centuries saw a rise in prices for both tillage and dairy produce and resulted in Irish landlords investing in extensive land improvement works within their holdings. This included widespread land drainage works, introduction of soil nutrients, grass planting and the enclosure of open lands into field systems that survive to the present-day. The popularity and success of potato farming contributed to a population boom during the 18th and early 19th centuries and its failure in the middle of the latter century was to have devasting consequences. The settlement pattern throughout much of the rural landscape was greatly affected by the Famine period and its aftermath which saw the depopulation of many areas. The following decades were marked by an increasing move away from small-scale subsistence farming towards more market-led pasture, assisted by the development of the Co-Op system, which also increased the extent of land reclamation of previously marginal lands.

The following summary of the development of Mullingar town and its environs during the medieval and post-medieval periods have been sourced from *the Irish Historic Town Atlas Volume 5: Mullingar* (Andrews *et al* 1992). The name Mullingar first appears in a 12th-century account of the life of an earlier local saint named Colman of Lynn. The existing town was founded by the Anglo-Normans after the Petit family were granted lands in the area by Hugh de Lacy in 1170 and quickly established a manor there around a motte and bailey which was later replaced by a stone castle. These fortifications were located by the banks of the River Brosna in the area now occupied by the town centre. The first record of a burgess dates to 1201 and the town received its first grant to hold fairs in 1207. By the 1230s the settlement contained a parish church, Augustinian and Dominican monasteries, a hospital and a Frankhouse where travellers were housed. Mullingar became the main county town in 1542 after the creation of the County of Westmeath during Henry VIII's reign. The town was struck by plague in 1575 which decimated the population, and in 1597 it was burned by Hugh O'Neill during the Nine Years' War. Later, in 1690, the town was occupied by the Williamite Army who used it to stockpile arms and supplies during their campaign against the Jacobite forces. The 17th-century Down Survey records that townland of Rathgowan, which contains the proposed development site, formed part of the possessions of Sir Luke Fitzgerrald in 1641 and was in the ownership of Richard Sherbrooke in 1670 when it contained 76 plantation acres of profitable land.

The existing townscape within the town centre developed after a devastating fire which swept through Mullingar in 1747. The strategic location of the town within a rich agricultural hinterland, combined with its location on the road between Dublin and Galway, saw it become an important centre for the wool and cattle trade during the 18th century. The 19th century saw the town continue to develop as

an important trade and transport centre following the opening of the Royal Canal in 1806 and the Midland Great Western Railway in 1848, both of which further connected the town with Dublin. The town also became an important army base in the 19th century with several regiments stationed at a barracks in the town which were built in 1814 and first occupied in 1819. The original barracks were built to accommodate 1000 soldiers and it was originally named Wellington Barracks. The barracks was renamed Columb Barracks after Patrick Columb, a member of the National Army who was killed on Mary Street, Mullingar in 1922. A 19th century description of the lands in the environs of the town notes that the system of agriculture was in an unimproved state; with not much waste land, but a considerable quantity of bog; and that stone of good quality for building is quarried (Lewis 1837). Further details on the layout of the proposed development site during the 19th century are presented in the below review of cartographic sources.

The study area contains one recorded archaeological site of potential 19th century date, and this comprises the former location of an upright stone (WM019-089003-), which has been described as follows by the Archaeological Survey of Ireland:

> *Site of possible standing stone located in field to the N of Columb Barracks on the outskirts of Mullingar town (WM019-089----). The constraint circle on the Record of Monument and Places Map for Co. Westmeath marks the site of a standing stone in the wrong field. An archaeological assessment was carried out in this field by Clare Mullins in 1997 prior to a housing development and no archaeological features were identified. A note on the map in the SMR file indicates that the possible standing stone originally was located in the field to the E of the constraint circle. The car park of a large shopping centre now stands in the area where the possible standing stone was originally located. It is possible that this standing stone was not a prehistoric monument but the remains of a 19th century War Department Boundary Stone marking out the boundary of the military property belonging to Columb Barracks. There are numerous boundary stones depicted in this field on the 1910 ed. OS 25-inch map.*

A review of the Westmeath Industrial Heritage Survey (www.westmeathculture.ie) revealed that it does not contain any entries for undesignated features of industrial heritage significance within the proposed development site.

Database of Irish Excavation Reports

As previously noted, a programme of archaeological test trenching was carried out within the proposed development site in 2020 and the results of this investigation are detailed in Section 15.6.7. The Database contains three entries for archaeological investigations carried out within fields to the west of the proposed development site in 2006 and 2007 which were undertaken in advance of a proposed housing development that did not proceed. Pre-development archaeological test trenching revealed a pit feature of archaeological potential, and this was subsequently subject to a full excavation (Table 15.6).

Table 15.6 Summary of Database of Irish Excavation Report Descriptions

Licence No.	Summary of Database Descriptions
06E0953	A probable Bronze Age pit feature was uncovered during testing. It presented as a black outer and grey inner circle with a total diameter of 0.35m. A quarter section revealed three depositions, the first a grey silt, the second the charcoal-rich lining of the pit and the final grey ash-enriched deposit. This final central deposit contained burnt-bone fragments that could clearly be seen in section. Full excavation of the pit feature and its environs and monitoring of topsoil removal in the vicinity of the pit was recommended and this was subsequently carried out under an extension to Licence 06E0953 (see below entry).
06E0953 ext.	A 20m by 20m area of excavation was opened around the pit feature described above revealed two additional pits that also contained burnt bone fragments. One of the pits was slightly larger than the others and showed signs of in situ burning, with scorched clay at the base of the pit extending out over the rim. It also contained the same charcoal-enriched clay/silt deposits, but it had a higher percentage of ash and burnt bone than the other pits. It seems likely from this evidence that this pit was used to carry out cremations and the burnt bones were deposited in the other two. No evidence of other features such as enclosing elements or ditches was found. No diagnostic artefacts were found within the pits. It is likely, however, that the burials date from the late Bronze Age or Iron Age. Monitoring of topsoil removal in the remainder of the field was recommended.
20R0256 21E051	A geophysical survey (20R0256) and archaeological testing (21E051) were carried out within a proposed development site which adjoins a ringfort (WM019-046), The geophysical survey identified a number of anomalies with archaeological potential and testing revealed the presence of a post-medieval vernacular house and outbuilding, an isolated pit with in-situ burning, and two charcoal-production kilns and a post-hole.

15.6.3 Architectural Heritage

The Record of Protected Structures published in the Westmeath County Development Plan 2021-2027 lists no Protected Structures within the proposed development site and it is not located within, or in the close environs of, an Architectural Conservation Area. There are a number of Protected Structures within the surrounding study are and the majority of these are also listed in the National Inventory of Architectural Heritage (Table 15.7 and Figure 15.1). The nearest Protected Structure to the proposed development is Barrack View (RPS 019-020), which is a late 19th century farmhouse contained within a property on the opposite (south) side of Ashe Road and is outside the southwest end of the boundary of the proposed development. This building was formerly listed in the National Inventory of Architectural Heritage (NIAH 15310002), which assigned it a 'Local' rating, but it is no longer included in that inventory. No curtilage lands or features associated with the farmhouse were noted within the proposed development site on historic map sources or during field inspections and test trenching investigations. The Record of Protected Structures also includes various buildings within the 19th century Columb Barracks complex which is located c.200m to the southeast of the proposed development site. The area between the barracks and the proposed development are occupied by a modern school and housing developments constructed during recent decades. The study area also contains the former location of Rathgowan House, which was an early 20th century residence listed in the NIAH (ref. 15310001). This building was situated within a property located c.200m to the west of the proposed development and is no longer extant.

Table 15.7 Designated Architectural Heritage Structures within Study Area

Name	Description	RPS no.	NIAH no.	NIAH rating
St Finian's College	Handball Alley	WM019-015	15309015	Regional
Rathgowan House (levelled)	House	-	15310001	Regional
Barrack View	House	WM019-020	-	-
Columb Barracks	House	WM019-021	15310003	Regional
Columb Barracks	Monument	WM019-023	15310006	Local
Columb Barracks	Barracks	WM019-024	15310007	Regional
St. Colman's chapel	Chapel	WM019-025	15310008	Regional
Columb Barracks	Prison	WM019-032	15310015	Regional
Columb Barracks	Well	WM019-033	15310016	Regional
Columb Barracks	Barracks	WM019-034	15310017	Regional
Columb Barracks	Barracks	WM019-035	15310018	Regional
Columb Barracks	Bath house	WM019-036	15310019	Regional

15.6.4 Cartographic Review

The cartographic sources examined for the study area comprised the 17th-century Down Survey mapping (Figure 15.2), the 1st edition 6-inch Ordnance Survey (OS) map (1838) (Figure 15.3) and the 25-inch OS map (1913) (Figure 15.4). The parish and barony maps compiled during the 17th-century Down Survey were carried out following the Cromwellian wars in the middle of that century and they present high-level pictorial depictions of major fortifications, churches and houses, settlement centres, roads, bridges and topographical features as well as summary information on existing land use and/or potential agricultural capability. The mapping depicts the lands to the west of Mullingar and no large structures are shown in this area. The proposed development site is shown as an area of vacant farmland with sub-rectangular fields on the 6-inch and 25-inch editions OS maps and no potential features of archaeological or architectural heritage significance were noted within the proposed development site.

Figure 15.2 Extract from 17th century Down Survey map showing Mullingar town and its environs (source www.downsurvey.tcd.ie)

Figure 15.3 Extract from 1st edition 6-inch OS map (1838) [OSI Licence 0003323]

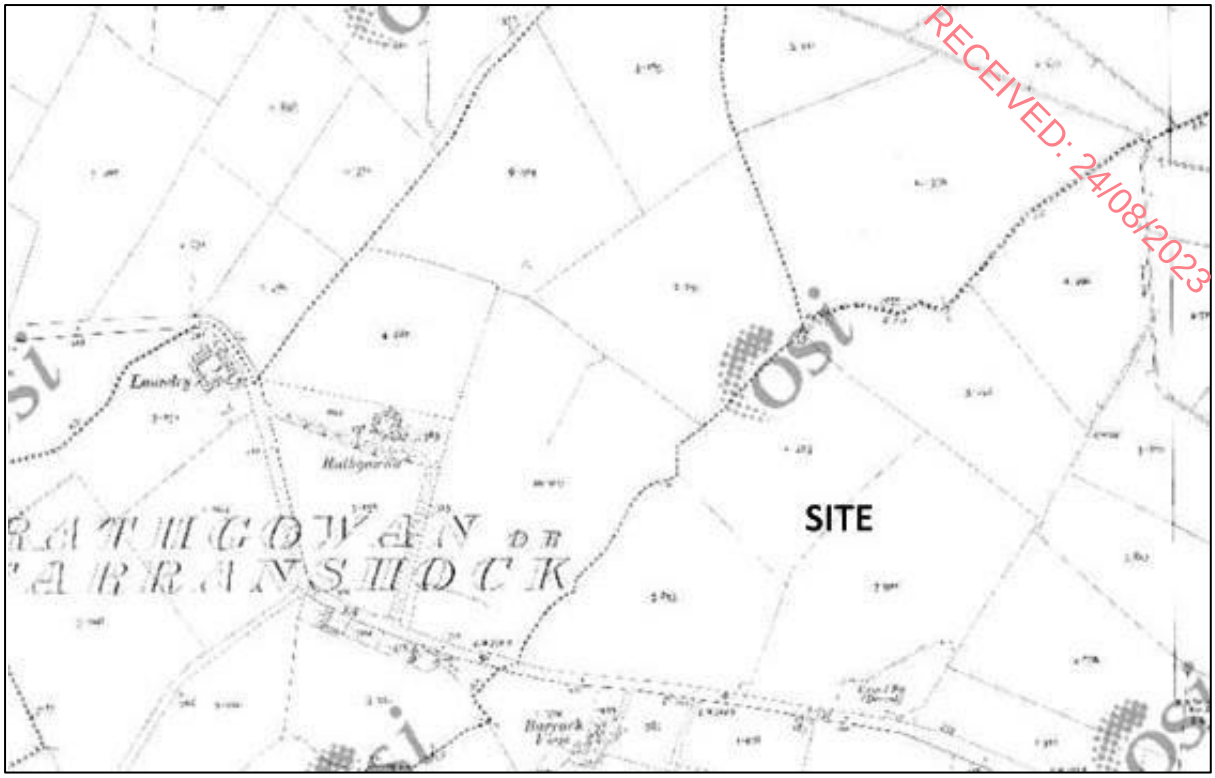

Figure 15.4 Extract from 25-inch OS map (1913) [OSI Licence 0003323]

15.6.5 Review of Aerial, Satellite and LiDAR Imagery

A review of publicly accessible aerial, satellite and LiDAR sources published by the Ordnance Survey of Ireland, Google, Bing Maps and the Geological Survey of Ireland (LiDAR) was undertaken in order to assess if any traces of potential unrecorded archaeological sites were visible within the proposed development site. The reviewed images all show the area within the proposed development site occupied by vacant, enclosed pasture fields and no evident traces of any potential unrecorded archaeological sites were noted (Figure 15.5 and Figure 15.6).

Figure 15.5 Satellite image of the proposed development site (source: Bing maps)

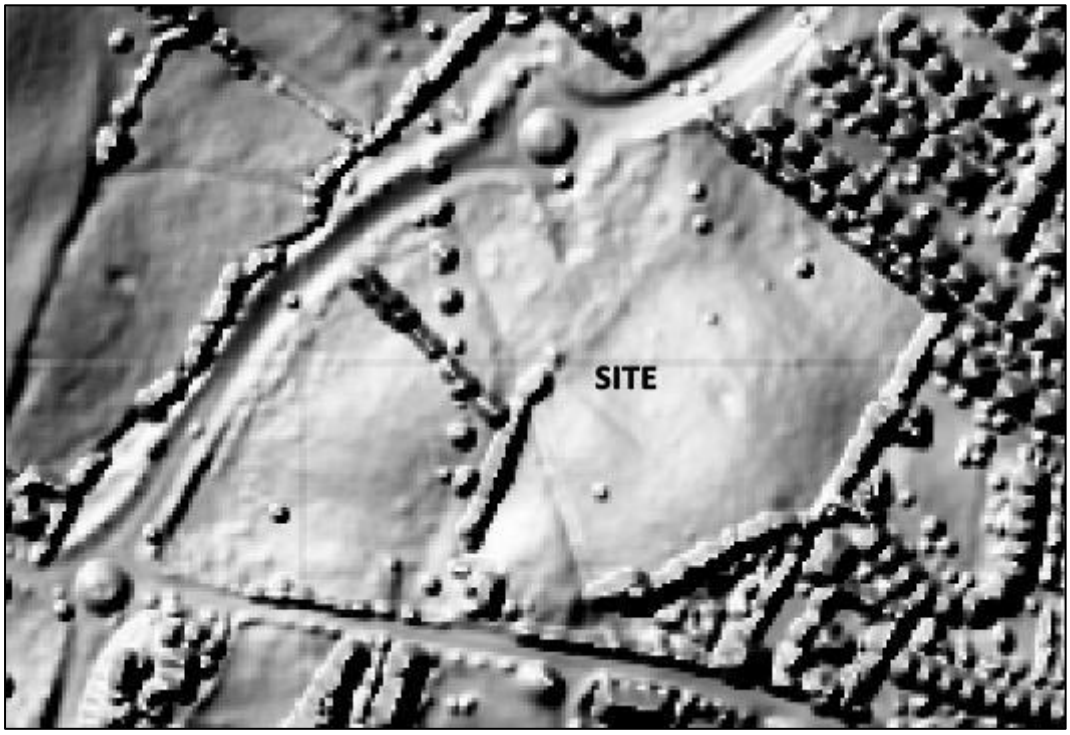

Figure 15.6 LiDAR image of the proposed development site

15.6.6 Undesignated Cultural Heritage Assets

While encompassing the archaeological and designated architectural heritage resource, cultural heritage also includes various undesignated assets such as settlements, demesne landscapes, vernacular structures, townland boundaries, folklore, placenames and historical events. There are no

vernacular buildings, or structures of any date, located within the proposed development site and it does not form part of a historic demesne landscape. A review of the National Folklore Commission's Schools Collection (www.duchas.ie) revealed that it does not contain any entries relating to stories or traditions associated with the study area.

Townlands are the smallest unit of land division in the Irish landscape and many preserve early Gaelic territorial boundaries that pre-date the Anglo-Norman conquest. The layout and nomenclature of Irish townlands was recorded and standardised by the work of the Ordnance Survey in the 19th century. The Irish translations of the townlands names often refer to natural topographical features, but name elements may also give an indication of the presence of past human activity within the townland, e.g., dun, lios or rath indicate the presence of a ringfort while temple, saggart, termon or kill record an association with a church site. The proposed development site is located within the west end of the large townland of Mullingar (An Muileann gCearr), which encompasses the town centre to the east, and the *muilleann* element of the name translates as 'mill'. There are no watercourses within the study area and the townland name is likely associated with historic milling activity elsewhere in the townland. There are no townland boundaries extending through the proposed development site.

15.6.7 Field Survey

There are two pasture fields within the proposed development site. The west field is generally level with a slight rise in ground terrain to the northwest. The majority of the field is well drained, except for the southwest corner where a number of reed-covered hollows were noted. These appear to be related to works associated with the construction of the adjacent Mullingar Western Relief Road. A well-maintained hedgerow forms the south boundary, a low denuded earthen bank, topped with a mature tree line forms the east and west boundaries and a modern timber fence encloses the field to the west. An overhead power line traverses the field and there is an ESB substation adjoining its southeast corner. The east field is also in use as pastureland and has a moderate rise to the north before levelling to the northwest. A modern timber fence forms the enclosing elements to the west and northwest and the remaining boundaries are formed by low earthen banks topped with mature tree lines. There are no structures of any date located within the fields and no surface traces of any potential unrecorded archaeological sites were identified.

15.6.8 Archaeological Test Trenching

All of the fields within the boundary of the proposed development were subject to a programme of archaeological test trenching in 2020 (Dunne 2020, Licence ref. 20E0255) which was carried out as part of an Archaeological Impact Assessment prepared for a previous planning application within the proposed development site (Westmeath Co. Council (WCC) ref. 21/139). A copy of the full test trenching report is provided in Appendix 15.1. The works entailed the excavation of twelve linear test trenches totalling 1055m in length and the upcast soil from each trench was visually inspected and systematically scanned with a metal-detector (Licence 20R0091) to assist in the identification of artefacts.

The site investigation revealed a mid to dark brown silty clay topsoil layer across the two fields and this measured 0.3- 0.5m in depth and contained occasional inclusions of modern pottery, plastics, glass and modern metal debris. The topsoil overlay a mottled orange-brown clay natural subsoil layer

with occasional natural inclusions of grey clays, manganese and gravel bands. Cultivation furrows truncated the subsoil surface, and these measured between 0.3-1.2m in width and 0.05-0.2m in depth. They were orientated northeast-southwest, evenly spaced and were infilled with topsoil material containing moderate inclusions of animal bone, brick and charcoal fragments with occasional inclusions of clay pipe stems and modern pottery sherds. Manually investigation of a series of furrows showed a number to have sharp sides with slightly rounded bases suggestive of hand/spade dug/lazy beds. The earliest finds from the fills of these furrows were clay pipe stems which was indictive of post-medieval or early modern date for their creation.

One potential archaeological pit was revealed in the east field, and this was circular in plan measuring 1.5m in diameter and limited manual investigation indicates it is 0.3m in depth. Metal detecting of the adjacent spoil from the trench revealed a fragment of polished copper alloy. While this pit feature is of unknown date, the potential that it is archaeological in origin is not discounted.

The Archaeological Impact Assessment Report recommended that this pit feature should be subject to a full archaeological excavation in advance of the construction phase (see Appendix 15.1). The Notification of Decision issued by Westmeath County Council for the application included a condition (No. 10) stating that the developer should carry out the recommendations set out in the Archaeology Report submitted as part of the application (WCC ref. 21/139). The online planning file on the County Westmeath planning enquiry system includes a letter from the Development Applications Unit which states that:

> *Having reviewed a report of an archaeological assessment carried out on this site, I can confirm that the National Monuments Service will have no archaeological objection to the development proceeding as planned, provided the pit feature discovered during test excavations is excavated archaeologically, as recommended in the assessment report.*
> *http://193.178.30.18/idocswebdpss/ViewFiles.aspx?docid=171812&format=djvu*

15.6.9 Discussion

There are no recorded archaeological sites within the proposed development site and there are no extant examples located within 500m of its boundary. The only recorded archaeological site located within the surrounding study area comprises the former site of a 19th century upright stone (WM019-089003-) which no longer survives and is of likely negligible cultural heritage value. The proposed development is also located c.670m outside the Zone of Notification around the historic core of Mullingar town. The proposed development site was previously subject to a programme of archaeological test trenching and the full excavation of a single pit feature of unknown date, which remains *in situ* within the site, was previously included as a condition in the County Westmeath grant of permission for an earlier application at this location (WCC ref. 21/139). This condition is in accordance with an observation/recommendation of the National Monuments Service, via the Development Applications Unit, during statutory consultations carried out as part of that planning application (see Section 15.6.8).

There are no Protected Structures, including associated curtilage features, or NIAH-listed buildings located within the proposed development site. There are a number of Protected Structures located

within the surrounding study area. Barrack View (RPS 019-020), a 19th century farmhouse, is located c.30m to the southeast of the site. This house was formed assigned a 'Local' rating by the NIAH and is no longer listed in that inventory, which indicates that the NIAH have assessed the house to be of low cultural heritage value. No curtilage features associated within this house, such as a garden or outbuildings, are located within the boundary of the proposed development site. Columb Barracks is located c.400m to the southeast of the proposed development and contains a number of buildings listed as Protected Structures (see Table 15.7 and Figure 15.1) which form a coherent group of 19th century military structures of likely high value. No intervisibility between the barracks and proposed development was noted during the site inspection. In addition, the proposed development site is not located within, of in the close environs of, an Architectural Conservation Area.

No undesignated features of cultural heritage interest, such vernacular or industrial heritage structures, townland boundaries, demesne lands or historical associations, were identified within the proposed development site.

15.7 The 'Do nothing' Scenario.

A 'Do Nothing Scenario' will see the continued preservation of recorded and potential cultural heritage features within the study area.

15.8 Potential Significant Effects

15.8.1 Construction Phase

There RMP and SMR list no recorded archaeological sites within the proposed development lands and no surviving examples are listed within 500m of its boundary. The construction phase of the proposed development will, therefore, have no predicted impact on the designated archaeological resource.

A programme of archaeological test trenching was carried out within the proposed development site in 2020 (see Section 15.6.8 and Appendix 15.1). This revealed one pit feature of unknown date which has the potential to be archaeological in origin. Ground works during the construction phase will have the potential to result in a permanent, direct, negative effects on this pit feature and this will require mitigation.

There are no designated architectural heritage structures located within the proposed development site and it contains no undesignated structures of architectural heritage interest. In addition, the proposed development site is not located within, or in the close environs of, an Architectural Conservation Area. The 19th century farmhouse known as Barrack View which is listed as a Protected Structure (RPS 019-020) is located on the opposite side of Ashe Road from the proposed development and was formerly rated as 'Local' significance by the NIAH. The proposed development will result in a temporary, indirect, not significant impact on the setting of this building during the construction phase. The former location of the early 20th century Rathgowan House, which is listed in the NIAH (ref. 15310001), is located c.200m to the west of the proposed development site. This house was demolished in recent years and no construction impacts on the setting of this levelled structure are, therefore, predicted. Columb Barracks, which contains a range of Protected Structures (see Table 15.7

and Figure 15.1) is located c.200m to the southeast of the proposed development, with modern buildings in the area between their locations, and no construction phase impacts on the setting of the barracks are predicted.

There are no undesignated vernacular structures, demesne lands, or historic settlements located within the proposed development site and no intangible attributes, such as historical or folklore associations, were noted during the assessment. No construction phase impacts on undesignated or intangible elements of the cultural heritage resource are therefore predicted.

15.8.2 Operational Phase

There are no extant recorded archaeological sites within the proposed development site or within 500m of its boundary. The proposed development will, therefore, have no predicted impacts on the setting of any recorded archaeological sites during the operational phase. Following the successful implementation of archaeological mitigation measures presented in Section 15.9, it is predicted that no impacts will arise in relation to the potential archaeological resource within the proposed development site during the operational phase.

There are no designated architectural heritage structures located within the proposed development site, it is not located within an ACA, and it contains no undesignated structures of architectural heritage interest. The proposed development will result in a not significant, indirect impact on the setting of Barrack View farmhouse (RPS 019-020) during the operational phase. No intervisibility between Columb Barracks, located c.200m to the southeast, and proposed development was noted during the field survey and a number of modern developments have been constructed in the area between their locations. The operational phase of the proposed development will, therefore, result in no predicted impacts on the setting of the barracks.

Given the absence of undesignated vernacular structures, demesne lands, or historic settlements located within the proposed development site combined with no known associated intangible attributes, such as historical or folklore associations, it is concluded that no operational phase impacts of such elements of the cultural heritage resource will arise.

15.8.3 Cumulative Effects

A review of the proposed Phase 3 residential development (Westmeath County Council planning ref. 22/515) to the west of the proposed development site revealed that its location contains no recorded archaeological sites or designated architectural heritage structures.

The location of a Part 8 Housing Scheme (22 no. units) at St. Brigid's Green, which is c.230m to the east of the proposed development site, was reviewed and it contains no recorded archaeological sites or designated architectural heritage structures.

The location of a Part 8 Housing Scheme (17 no. units) at the junction of Delvin and Robinstown Road, Springfield, Mullingar, which is c.2.05km to the east of the proposed development site, was reviewed and it contains no recorded archaeological sites or designated architectural heritage structures.

The location of a Part 8 Housing Scheme (15 no. units) on four sites at Emell Court and Trinity Cottages, which is c.670m to the southeast of the proposed development site, was reviewed and it contains no recorded archaeological sites or designated architectural heritage structures.

The location of a Part 8 Housing Scheme (32 no. units) at Friar's Mill Road/Canal Avenue, which is c.1.46km to the east of the proposed development site, was reviewed and it extends into the Zone of Notification of the recorded location of a levelled Franciscan Friary (WM019-089013-). A review of the Database of Irish Excavations (www.excavations.ie) revealed that a number of archaeological investigations have been carried out as part of development projects in the Friar's Mill Road area and none have identified remains of the friary site.

The section of the Mullingar Western Relief Road along the east side of the proposed development site does not contain the recorded locations of any archaeological sites or architectural heritage structures.

Based on the review of the above developments, the proposed development is not predicted to act in combination with them to result in any cumulative impacts on the cultural heritage resource of the area.

The proposed development site does not contain any recorded archaeological sites, Protected Structures, NIAH-listed buildings or gardens, or other structures of industrial or vernacular heritage significance and will not result in any cumulative impacts relating to relevant cultural heritage policies and objectives outlined in the Westmeath County Council County Development Plan 2021-2027 and the Mullingar Local Area Plan (LAP) 2014-2020.

15.9 Mitigation

15.9.1 Construction Phase Mitigation

The pit feature identified during the 2020 programme of test trenching within the proposed development site will be subject to a full archaeological excavation in advance of construction phase works at its location (see Appendix 15.1). This mitigation measure will comply with a condition included in the previous grant of permission for a previous planning application within the proposed development site (WCC ref. 21/139) as well as the National Monuments Service's observations/recommendations in relation to that development (see Section 15.6.8). There are no structures of architectural heritage interest or other cultural heritage assets located within the proposed development site and no mitigation measures for these elements of the cultural heritage resource are required.

15.9.2 Operational Phase Mitigation

All required mitigation measures will be enacted during the construction phase and, therefore, no cultural heritage mitigation measures during the operational phase of the proposed development are predicted.

15.9.3 Cumulative Mitigation

No cumulative impacts on the cultural heritage resource are predicted and, therefore, no mitigation measures for such impacts are required.

15.10 Residual Impact Assessment

15.10.1 Construction Phase

The proposed development site does not contain recorded archaeological sites or architectural heritage structures and the construction phase will result in no residual impacts on these elements of the cultural heritage resource. The mitigation measures presented in Section 15.9 will provide for the proper and adequate recording of a pit feature of archaeological potential by full archaeological excavation. This will result in a high magnitude of impact on this feature of unknown date which will be ameliorated by the creation of a full and detailed archaeological record, the results of which shall be publicly disseminated. This shall result in a potential slight/moderate range of significance of effect in the context of residual impacts on the unrecorded archaeological resource.

15.10.2 Operational Phase

The proposed development will result in a not significant, indirect residual impact on the setting of Barrack View farmhouse (RPS 019-020) during the operational phase.

15.10.3 Cumulative Impact

No residual cumulative impacts on the cultural heritage resource have been identified.

15.11 Risk of Major Accidents or Disasters

No risks of major accidents or disasters associated with cultural heritage resource are predicted.

15.12 Significant Interactions

No significant interactions between the cultural heritage resource and other topics assessed in this EIAR are predicted.

15.13 References & Sources

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http://downsurvey.tcd.ie/down-survey-maps.php (Down Survey)

http://spatial.dcenr.gov.ie/imf/imf.jsp?site=GSI_Simple (Bedrock)

www.archaeology.ie (SMR and NIAH)

www.duchas.ie (Folklore)

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www.logainm.ie (Placenames)

www.heritagemaps.ie/WebApps/HeritageMaps/index.html (Irish Heritage Council)

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Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 16

Significant Interaction of Impacts

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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16 Significant Interaction of Impacts

16.1 Introduction

The construction, operational and cumulative impacts of the proposed residential development at Rathgowan, Mullingar, Co. Westmeath have been assessed within each chapter of the EIAR (Environmental Impact Assessment Reports). This chapter describes any interactions of impacts identified in the previous chapters and identifies where any of these are significant.

The potential cumulative effects of the proposed project in combination with other permitted developments in proximity has been considered in each chapter as relevant.

16.1.1 Expertise and Qualifications

This chapter of the EIAR has been prepared by Saoirse Kavanagh, Executive Planning Consultant of McCutcheon Halley Planning Consultancy. Saoirse holds a bachelor's degree in Arts (International), majoring in Geography, and a Master's in Planning and Sustainable Development. She has over 4 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the following three Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

- Cooldown Commons Strategic Housing Development, Citywest, Dublin.
- Parkside 5B Strategic Housing Development, Belmayne, Dublin.
- Clonattin Strategic Housing Development, Gorey, Co. Wexford.

16.1.2 Characteristics of the Proposed Development

Details on the proposed development are provided in Chapter 2. To summarise, the applicant seeks permission for development of 181 residential units at 'Rathgowan, Mullingar, Co. Westmeath. This development will comprise Phase 1 and 2 of development. Phase 3 was permitted by Westmeath County Council in January 2023 and will provide a further 213 no. residential units.

16.1.3 Assessment Methodology – Legislative Requirements

The EIAR has considered and assessed the interactive effects and cumulative impacts arising from the construction and operation of the proposed development based on best scientific knowledge. Interactive effects (or interactions), specifically refer to any direct or indirect effects caused by the interaction of environmental factors as outlined in Article 3 (1) of the amended EIA (Environmental Impact Assessment) Directive:

> *"The environmental impact assessment shall identify, describe, and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:*
>
> *(a) population and human health;*

(b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;

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

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

(e) the interaction between the factors referred to in points (a) to (d).”

Annex IV of the amended Directive states that a description of impacts should include:

“…the direct effects and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative effects of the project”

EU (European Union) Guidance identifies that;

“Cumulative effects are changes to the environment that are caused by an action in combination with other actions. They can arise from:

the interaction between all of the different Projects in the same area;

the interaction between the various impacts within a single Project (while not expressly required by the EIA Directive, this has been clarified by the CJEU – see the box below).

The coexistence of impacts may increase or decrease their combined impact. Impacts that are considered to be insignificant, when assessed individually, may become significant when combined with other impacts.”

The relevant interactions and interdependencies between specific environmental aspects have been summarised in the matrix set out in Table 16.1.

16.2 Description of Potential Significant Interactions

16.2.1 Population and Human Health

Chapter 4 assesses the likely impacts to Population and Human Health arising from the proposed development. During the construction phase, the following aspects would interact with Population and Human Health and in the absence of mitigation may give rise to significant effects.

- Landscape and Visual Impact: Potential effects on visual amenity within the locality or the wider study area as a result of the visibility of construction activities such as site clearance, the construction of buildings, associated scaffolding, plant, site traffic and construction compounds.
- Soils and Geology: Site clearance has the potential to result in increased dust and particulate emissions to air as well as the potential to release contaminated soils to the local environment.
- Air and Climate: Construction activities may result in a decrease in local air quality which has the potential to negatively impact on human health.

- Noise and Vibration: increased levels of noise and vibration during construction activities may result in negative impacts to the amenity of local residents.
- Traffic and Transportation: Construction traffic has the potential to negatively impact local residents and businesses through increased delays and potential impacts on health and safety.

During the operational phase, the potential interactions are:

- Landscape and Visual Impact: Potential effects of the development on views and visual amenity such as the potential for the development to alter (beneficial or adverse) the composition of the view from a viewpoint.
- Traffic and Transportation: Increased traffic once the development is fully operational has the potential to negatively impact local residents and temporary receptors.

The potential significant impacts to Population and Human Health have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

16.2.2 Soils and Geology

Chapter 5 assesses the likely impacts on Soils and Geology arising from the proposed development. The potential for Significant Interaction with the Soils and Geology (Geology) attribute arises mainly due to the removal of the topsoil and shallow subsoils (archaeology) across some of the site area and risk of dust (air quality), changes to drainage patterns (hydrology) and suspended sediments impacting local water ways, (biodiversity) arising during the construction phase. The Hydrogeology (aquifer) could be potentially impacted if large losses/spills of hydrocarbons occurred, although the thick layer of glacial till offers a natural protection to the underlying water table from surface activities. While local changes to the permeability will occur, they are not at a scale which would affect the recharge of the aquifer in the locality. Ultimately cut and fill activities will be kept to a minimum and there will be limited change to the topography and landscape setting of the locality. No waste soil material is anticipated to arise.

Overall, the potential significant impacts to Soils and Geology have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

16.2.3 Hydrology and Hydrogeology

Chapter 6 assesses the likely potential impacts on Hydrology and Hydrogeology arising from the proposed development. Hydrology and Hydrogeology attributes interact with other environmental attributes are summarised as follows:

- Population & Human Health - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on human health. However, the mitigation measures described in Chapter 6 – Hydrology & Hydrogeology will ensure that this will not occur.
- Biodiversity - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on biodiversity conditions present. However, the mitigation measures

described in Chapter 6 – Hydrology & Hydrogeology, and those relevant in Chapter 14 – Biodiversity will ensure that this will not occur.

- Soils & Geology - Potential impacts on the receiving hydrology and hydrogeology environment could also impact on soils and geology conditions present. However, the mitigation measures described in Chapter 6 – Hydrology & Hydrogeology, and those relevant in Chapter 5 – Soils and Geology will ensure that this will not occur.

The potential significant impacts to Hydrology and Hydrogeology have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

16.2.4 Air Quality

Chapter 7 assesses the likely potential impacts on Air Quality arising from the proposed development. During the construction phase, the following aspects would interact with Air Quality and in the absence of mitigation may give rise to significant effects.

- Traffic and Transportation: Emissions from construction traffic may result in a decrease in local air quality. Increased greenhouse gas emissions from construction traffic may contribute to climate change.

During operation, the potential interactions are;

- Traffic and Transportation: Emissions from operational traffic may result in a decrease in local air quality. Increased greenhouse gas emissions from traffic may contribute to climate change.

No other potential operational interactions were identified, and no other potential significant interactions have been identified other than those already described. The potential significant impacts to Air Quality and Climate have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

16.2.5 Climate

Chapter 8 assesses the likely potential impacts on the climate arising from the proposed development. Climate interacts with the following environmental aspects:

- Hydrology and Hydrogeology: The impact of flood risk has been assessed and the surface water drainage network will be designed to cater for run-off from the building and the surrounding hardscaped areas in accordance with a minimum 1 in 100-year event plus 20% climate change allowance.
- Waste: 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
- Air Quality: Air quality and climate have interactions due to the emissions from the burning of fossil fuels during the construction and operational phases generating both air quality and climate impacts.

16.2.6 Noise and Vibration

Chapter 9 assesses the likely potential impacts on Noise and Vibration arising from the proposed development. During the construction phase, the following aspects would interact with Noise and Vibration and in the absence of mitigation may give rise to significant effects.

- Traffic and Transportation: Construction traffic may give rise to local noise and vibration which may have an impact on the amenity of local residents;

During operation, the potential interactions are;

- Traffic and Transportation: Additional construction traffic may give rise to increased local noise and vibration which may have an impact on the amenity of local residents;
- Vibration: The development is residential and educational in nature; therefore, it is not anticipated that there will be any outward impact associated with vibration for the operational phase.

No other potential significant interactions have been identified other than those already described. The potential significant impacts of Noise and Vibration have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

16.2.7 Landscape and Visual Impact

Chapter 10 assesses the likely potential impacts on Landscape and any visual impacts arising from the proposed development. During the construction phase, the following aspects would interact with Landscape and visual amenity and in the absence of mitigation may give rise to significant effects;

- Material Assets: Service infrastructure and Utilities: excavations to provide site services during construction will result in changes to the existing landscape, and result in short term visual impacts.

No other potential significant interactions have been identified other than those already described. The potential significant impacts of Landscape and any visual impacts have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

16.2.8 Material Assets: Waste

Chapter 8 assesses the likely potential impacts on waste arising from the proposed development. Waste interacts with the following environmental aspects:

- Population and Human Health: In the absence of mitigation, the improper removal, handling, and storage of 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.
- Hydrology and Hydrogeology: All connections to the public water network (water supply or foul sewer), abstractions from water supply and discharges to the foul sewer during the Construction and Operational Phases will be under consent from Irish Water.

- Traffic: Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the local areas.

16.2.9 Material Assets: Traffic & Transport

Chapter 12 assesses the likely impacts on Traffic and Transport arising from the proposed development. Traffic and Transportation interacts with other environmental attributes as follows;

- Air Quality: Particulates and gaseous emissions from traffic (both on and off-site) and residual dust dispersal associated with traffic movements have been addressed in the Air Quality chapter (Chapter 7).
- Climate: Increased emissions due to the burning of fossil fuels generates impacts on the climate and is addressed in Chapter 8 Climate.
- Noise: The impacts from traffic and transport in terms of noise generation is addressed in the Noise & Vibration chapter (Chapter 9).

The potential significant impacts of Traffic and Transport have been considered within the relevant discipline and mitigation measures outlined where required. No other significant interactions have been identified, other than those discussed above. With mitigation measures in place, no significant residual negative impacts are predicted.

16.2.10 Material Assets: Services Infrastructure and Utilities

Chapter 13 assesses the likely impacts on Services and Infrastructure arising from the proposed development. During the construction phase, the following aspects would interact with Services and Utilities, and in the absence of mitigation may give rise to significant effects.

- Biodiversity: Site clearance and earth works may result in disturbance or displacement of fauna and birds. Construction lighting within the footprint of the proposed development has the potential to cause increased light pollution of adjacent areas and could potentially impact on fauna (bats, mammals, or birds) foraging in adjacent habitats. Any negative impacts on water quality as a result of excavations and discharge of silt, sediment or pollutants to surface waters may result in impacts to biodiversity downstream of the site. This is deemed minimal due to the location of the subject site away from major water bodies and water ways.
- Cultural Heritage and Archaeology: There may be an impact to Cultural Heritage and Archaeology if previously undiscovered sub-surface remains are damaged or destroyed during excavations to provide utilities. Chapter 15 deems that there is no anticipated interaction for the construction phase.

During operation, the potential interactions are;

- Biodiversity: disturbance to fauna (bats, mammals, or birds) arising from artificial light spillage into the environment from the associated lighting scheme.

The potential significant impacts to Services Infrastructure and Utilities have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted.

16.2.11 Biodiversity

Chapter 14 assesses the likely impacts on Biodiversity arising from the proposed development. No other potential significant interactions have been identified other than those already described. 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 residual negative impacts are predicted.

16.2.12 Cultural Heritage and Archaeology

Chapter 13 assesses the likely impacts to Cultural Heritage and Archaeology arising from the proposed development. No other significant interactions have been identified, other than those discussed above. The potential significant impacts to Cultural Heritage and Archaeology have been considered within the relevant discipline and mitigation measures outlined where required. With mitigation measures in place, no significant residual negative impacts are predicted

Table 16.1 Potential Interaction of Effects Matrix (Con = Construction, Op = Operations. X = interaction noted. If no potential effect the box is left blank)

Interaction	Population & Human Health		Land, Soils & Geology		Hydrology & Hydrogeology		Air Quality		Climate		Noise & Vibration		Landscape & Visual Impact		MA: Waste		MA: Traffic & Transport		MA: Service Infrastructure & Utilities		Biodiversity		Cultural Heritage & Archaeology	
	Con	Op	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																			
Land, Soils & Geology	X				X																			
Hydrology & Hydrogeology			X	X					X	X														
Air Quality	X		X				X																	
Climate					X	X	X	X																
Noise & Vibration	X																X							
Landscape & Visual Impact	X	X																						
Material Assets: Waste	X				X				X	X							X	X			X	X		
Material Assets: Traffic & Transport	X	X				X	X	X	X	X	X													
Material Assets: Service Infrastructure & Utilities	X																							
Biodiversity			X		X														X	X				
Cultural Heritage & Archaeology			X																X					

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 17

Summary of Mitigation Measures & Monitoring

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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17 Schedule of Mitigation Measures

17.1 Introduction

This chapter includes the full schedule of mitigation measures and monitoring where proposed.

17.1.1 Mitigation

The draft EPA Guidelines on the Information to be contained in Environmental Impact Assessment Reports (EPA, 2017) identifies that there are 4 established strategies for the mitigation of effects; avoidance, prevention, reduction and offsetting.

Mitigation by Avoidance: Avoidance usually refers to strategic issues, such as site selection, site configuration or selection of process technology. This may be the fastest, cheapest and most effective form of effect mitigation. In some cases mitigation by avoidance may also be considered as part of the "consideration of alternatives".

Mitigation by Prevention: This usually refers to technical measures. Where a potential exists for unacceptable significant effects to occur (such as noise or emissions) then measures are put in place to limit the source of effects to a permissible and acceptable level.

Mitigation by Reduction: This is a very common strategy for dealing with effects which cannot be avoided. It tends to concentrate on the emissions and effects and seeks to limit the exposure of the receptor. This is regarded as a less sustainable, though still effective, approach, implemented through reducing the effect and/or reducing exposure to the effects.

Mitigation by Remedy/Offsetting: This is a strategy used for dealing with adverse effects which cannot be prevented or reduced. Remedy is compensating for or counteracting adverse effects. Examples include increased planting of specific trees/shrubs to replace unavoidable loss of vegetation, or provision of a new amenity area to compensate for the unavoidable loss of access to the grounds of an old house. Examples of Offsetting include reinstating buildings, walls or features, or the introduction of tunnels to enable wildlife to access other comparable habitats.

17.1.2 Monitoring

Some disciplines have proposed monitoring following their assessment of impacts and implementation of proposed mitigation measures. Monitoring will take place after consent is granted in order to demonstrate that the project in practice conforms to the predictions made during the EIA process. Monitoring provides assurance that proposed systems are operating as intended. This allows adjustments of operations to be made to ensure continued compliance with consent conditions such as emission limit values, conditions of operation, performance criteria/ indicators and detection of unexpected mitigation failures.

The EPA Guidelines also state that "*It is particularly important that the developer understands their commitment to mitigation measures that are proposed in an EIS. These are enforceable undertakings that will have to be put in place and sustained when the project is implemented*".

The following mitigation and monitoring measures have been proposed by the specialist consultants during preparation of the EIAR, and approved by Glenveagh Homes Ltd.

Table 17.1 Mitigation and Monitoring Table

Potential Impact	Construction	Operation
EIAR Chapter 2 Project Description		
Potential impacts during construction	Chapter 2 describes the project and includes construction stage controls and mitigation measures. These are also set out in the Preliminary Construction and Environmental Management Plan (CEMP), and include those measures set out below. It will be a requirement that all personnel will understand and implement the CEMP.	None Proposed
EIAR Chapter 3: Alternatives Considered		
Potential impacts have been mitigated by design, as set out in Chapter 2 and Chapter 3.	Alternatives may be described at six levels: do-nothing alternative, alternative locations, alternative layouts, alternative design, alternative processes and alternative mitigation measures. The consideration of the main alternatives in respect of the development of the subject land was undertaken by the Design Team.	All potential mitigation measures relating to alternative layout and design have been incorporated in the final agreed design of the project, and therefore there is no requirement to provide operational mitigation measures.
EIAR Chapter 4: Population and Human Health		
Potential impacts have been mitigated by design, as set out in Chapter 2 and Chapter 3.	Health and Safety measures: ▪ Securing the Site Boundary and erecting of fencing or hoarding/signage as required ▪ Minimizing the disruption of services through adequate engagement with utility and service providers ▪ Restriction of construction working hours and traffic access ▪ Site access and egress ▪ Preparation of an Emergency and Evacuation Plan ▪ Maintenance of Public Roads ▪ Communication with Local Authorities and Neighbours	No mitigation measures are required.
Monitoring	No specific monitoring is proposed.	No specific monitoring is proposed.

Potential Impact	Construction	Operation
EIAR Chapter 5: Land, Soils, and Geology		
Potential Impacts	The mitigation measures as outlined below, will ensure that there will be no significant impact on the receiving land, soil and geology. A preliminary Construction Environmental Management Plan (CEMP) has been prepared by Tobin Consulting Engineers (Tobin Consulting Engineers, 2023a). Following appointment, the contractor will be required to implement the measures set out CEMP and maintain environmental monitoring records for the duration of the project which shall be made available to representatives from Westmeath County Council for inspection on request. The CEMP is considered as a 'Live Document' and will be updated accordingly throughout the project as required. Mitigation works will be adopted as part of the construction works for the proposed development. The measure will address the main activities of potential impact which include: ▪ Control and Management of water and surface runoff; ▪ Control of Management of works nears water courses; ▪ Control of Management of materials from off-site sources; ▪ Appropriate fuel and Chemical handling, transport and storage; and ▪ Management of accidental release of contaminants at the subject site. A Construction Demolition & Operational Waste Management Plan (CDOWMP) has been prepared by Tobins Consulting Engineers for the Proposed Development (Tobins Consulting Engineers, 2023b). The purpose of the CDWOMP is to ensure that waste storage and movement within the development takes place in a matter which compiles with relevant legislation and has a minimum impact on the nearby existing commercial and residential areas. The CDWOMP (Tobin Consulting Engineers, 2023b) includes estimated quantities of construction waste which will be produced	There is no requirement for mitigation measures for the Operational Phase taking account of the design measures for the proposed development.

Potential Impact	Construction	Operation
	during the Construction of the Proposed Development. The CEMP (Tobin Consulting Engineers, 2023a) and CDOWMP (Tobin Consulting Engineers, 2023b) will take cognisance of measures outlined in the EIAR. **Import of Aggregates** As outlined in the CEMP (Tobin Consulting Engineers, 2023a), all fill and aggregates will be sources from reputable, approved supplied. As a minimum, all suppliers will be required to: ▪ Provide aggregate compliance certificates/declarations of conformity for the classes of material specified for the proposed development. ▪ Provide proof of an acceptable environmental management status; and ▪ Provide proof of the regulatory and legal compliance status of the company. Contract and procurement will ensure that all imported aggregates required for the Proposed Development will be sourced from reputable supplied operating in a sustainable manner and in accordance with industry conformity/compliance standards and statuary obligations. The importation aggregates shall be subject to management and control procedures which shall include testing for contaminants, invasive species and other anthropogenic inclusions and assessment of the suitability for use in accordance with engineering and environmental specifications for the Proposed Development. Therefore, any unsuitable material will be identified prior to unloading / placement onsite. **Airborne Dust Generation** Excavated soils will be carefully managed and maintained in order to minimise potential impact on soil quality and soil structure. Handling of soils will be undertaken in accordance with documented procures that will be set out in order to protect ground and minimise airborne dust. The normal measures required to prevent airborne dust emissions and associated nuisance arising from site work will be in place including measures to prevent	

Potential Impact	Construction	Operation
	uncovered soil drying out leading to wind pick up of dust and mud being spread onto the local road network and adjoining properties. This will require additional wetting at the point of dust release, dampening down during dry weather and wheel cleaning for any vehicles leaving the site. Potential impacts and avoidance and mitigation measures associated with generation of dust are addressed in Chapter 7 of this EIAR. As outlined in the CEMP (Tobin Consulting Engineers, 2023a), excavated material will be removed as soon as possible minimising the potential for stockpiles to created windblown dust. Daily inspections by the main contractor will be carried out to identify potential sources of dust generated along with implementation measures to remove caused which are found. Impacts of dust from the use of excavators, HGVs and vibrating rollers are considered to be temporary in duration and not considered to give rise to significant air quality impacts following the implementation of the following measures as set out in the CEMP: ▪ All machinery will be suitably maintained to ensure that emissions of engine-generated pollutants shall be kept to a minimum in accordance with Measures Against the Emission of Gaseous and Particulate Pollutants from Internal Combustion Engines to be Installed in Non-Road Mobile Machinery (2002/88/EC) and Emissions of Pollutants from Diesel Engines (2005/21/EC); ▪ Vehicles will not be left unnecessarily idling on the site and trucks removing demolition waste from the site will turn off engines during loading. ▪ Pre-start checks on all machinery will be conducted daily prior to commencement of activities. ▪ Low emission fuels will be used insofar as possible; and ▪ Mains power will be used for small plant and equipment, where possible, in preference to generators.	

Potential Impact	Construction	Operation
	Reuse of Soil Soil and subsoil materials to be reused within the Proposed Development (i.e., for landscaping on site) will be subject assessment of the suitability of for use in accordance with engineering and environmental specification for the Proposed Development. **Management and Control of Soils and Stockpiles** The re-use of suitable cut material on-site for the Proposed Development (i.e., landscaping, raising levels or engineering fill) will be undertaken in accordance with the engineered design of the Proposed Development. Surplus or unsuitable soils will be removed offsite. Segregation and storage of soils for re-use onsite or removal off-site and waste for disposal off-site will be segregated and temporary stored on-site pending removal or for reuse on-site in accordance with the CEMP (Tobin Consulting Engineers, 2023a). As detailed in the CEMP (Tobin Consulting Engineers, 2023a), temporary storage of soil and stockpiles will be carefully managed in such a way as to prevent any potential negative impact on the receiving environment and the material will be stored away from any open surface water drains. No soil storing will be allowed within 30m of the open water where sufficient working areas are available within the site boundary, which is in line with Inland Fisheries Ireland guidelines. The 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;	

Potential Impact	Construction	Operation
	▪ Material identified for reuse on site, off site and waste materials will be individually segregated; and all segregation, storage and stockpiling locations will be clearly delineated on the site drawings; ▪ Tarpaulins or polythene sheets will be used to cover stockpiles of material during heavy rainfall to avoid sediment release; ▪ Material identified for reuse on site, off site and waste materials will be individually segregated; ▪ Regular watering will take place to ensure the moisture content is high enough to increase the stability of the soil and thus suppress dust; and ▪ Stockpiles will be a minimum of 10m from drains. **Export of Resource (soil) and Waste** All surplus materials and any waste will be removed off-site in accordance with the requirements outlined in the CDWOMP (Tobin Consulting Engineers, 2023b) 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 off-site. The re-use of soil and rock 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	

Potential Impact	Construction	Operation
	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. Materials and waste will be documented prior to leaving the site. All information will be entered into a waste management register kept on the site. Vehicles transporting material with potential for dust emissions to an off-site location shall be enclosed or covered with a tarpaulin at all times to restrict the escape of dust. Public roads outside the site, in particular the R394, shall 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. A wheel-wash system will be set up in the event there is a risk of debris deposited on the road as outlined in the CEMP (Tobin Consulting Engineers, 2023a). **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 Contractor and in accordance with the CEMP (Tobin Consulting Engineers, 2023a) and relevant industry standards. All ready-mixed concrete will be delivered to the site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will	

Potential Impact	Construction	Operation
	then be emptied into a skip for appropriate compliant removal offsite. A suitable risk assessment for wet concreting shall be completed prior to works being carried out. **Handling of Fuels, Chemicals and Materials** Fuelling and lubrication of equipment will be carried out in a designated areas of the site away from any existing manholes or gullies. Fuelling and lubrication of equipment will only be carried out in a designated area of the site away from any existing manholes or gullies. At present, it is proposed that fuel and lubricants will be stored adjacent to the office compound. Bunds will have regard to Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013c). 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. This bunded area will be roofed appropriately to exclude rainwater. Mobile fuel bowsers may be used for refuelling heavy equipment. Bowsers used will be double skinned and spill kit/drip tray equipment will be used during refuelling which will take place away from any nearby drains or watercourses and from any surface water drainage gulley's (Tobin Consulting Engineers, 2023a). 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. As outlined in the CEMP (Tobin Consulting Engineers, 2023a), 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	

Potential Impact	Construction	Operation
	the fuel storage area for use in the event of any incident during refuelling or maintenance works. Heavy machinery used on the site will also be equipped with its own spill kit. **Emergency Procedures** In the event of an environmental incident, the appointed Project Environmental Manager will be notified immediately, and absorbent materials used to prevent the spread of the spill/leak. The contaminated materials will be transferred to leak-proof storage containers and any contaminated soils or gravels excavated and removed off-site. A record of the incident will be kept, and Westmeath County Council will be notified. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements. ▪ Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site; ▪ Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants; ▪ Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained; ▪ In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the site and compliantly disposed 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 for in the event of accidental fuel spillages; and	

Potential Impact	Construction	Operation
	▪ All construction works staff on-site will be fully trained on the use of equipment. This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving land, soil and geological environment associated with the Construction Phase of the Proposed Development. **Welfare Facilities** Welfare facilities have the potential, if not managed appropriately, to release organic and other contaminants to ground or surface water courses. Portaloos will be provided in the compound initially, with a dedicated toilet block installed later. 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.	
Monitoring	During the Construction Phase of the Proposed Development 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 measure that are protective of water quality are fully implemented and effective; ▪ Materials management and waste audits will be carried out at regular intervals to monitor the following: ○ Management of soils on-site and for removal offsite. ○ Record keeping. ○ Traceability of all materials, surplus soil and other waste removed from the site; and Ensure records are maintained of material acceptance at the end destination	Ongoing regular operation monitoring of the SUDs measure will be undertaken throughout the lifetime of the operational phase of the Proposed Development. The management and maintenance requirements for the each of the SUDs are developed in line with the CIRIA SUDs Manual

Potential Impact	Construction	Operation
EIAR Chapter 6: Hydrology and Hydrogeology		
Potential Impacts	A preliminary Construction Environmental Management Plan (CEMP) has been prepared by Tobin Consulting Engineers (Tobin Consulting Engineers, 2023a). Following appointment, the contractor will be required to implement the measures set out CEMP and maintain environmental monitoring records for the duration of the project which shall be made available to representatives from Westmeath County Council for inspection on request. The CEMP is considered as a 'Live Document' and will be updated accordingly throughout the project as required. Mitigation works will be adopted as part of the construction works for the Proposed Development. The measure will address the main activities of potential impact which include: ▪ Control and Management of water and surface runoff; ▪ Control of Management of works nears water courses; ▪ Control of Management of materials from off-site sources; ▪ Appropriate fuel and Chemical handling, transport and storage; and ▪ Management of accidental release of contaminants at the subject site. 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);	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 of the receiving environment. 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. With regard to the Proposed discharge of treated operational surface water from the Proposed Development the land drains eventually discharging to the Brosna River waterbody, the potential for surface water generated at the Proposed Development to cause significant effects to downstream sensitivities during the operational phase would be considered negligible due in part to the SuDS measures and petrol interceptor incorporated in the overall design.

Potential Impact	Construction	Operation
	▪ 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); and ▪ 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 construction phase of the Proposed Development. All run-off from the subject site or any areas of exposed soil will be managed as required with temporary pumping and following appropriate treatment as required. Dewatering to lower groundwater levels is not anticipated. However, where surface water runoff must be pumped from excavations, water will be managed in accordance with best practice standards (i.e., CIRIA C750), the CEMP and regulatory consents to minimise the potential impact on the local groundwater flow regime within the soil and bedrock. Unauthorised discharge of water (groundwater / surface water runoff) to ground, drains or watercourses will not be permitted. works. The appointed Contractor will ensure that the discharge of water to ground, drains or watercourses will be in accordance with the necessary discharge licences issued by UE under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from Westmeath County Council under Section 4 of the Local Government (Water Pollution) Act 1977, as	

Potential Impact	Construction	Operation
	amended in 1990 for discharges to surface water. A buffer zone of 30m will be maintained between onsite drains of open water located on the site and any stockpiles of loose materials pending re-use onsite. Silt fences will be erected at the toe of stockpiles to prevent run-off. The silt fences will be monitored daily by the main contractor and silt will be removed from required. A regular review of weather forecast will take place, insofar as possible, ground excavation works will be scheduled during period of dry weather to minimise potential for silt laden run-off. **Handling of Fuels and Hazardous Materials** Fuelling and lubrication of equipment will be carried out in a designated areas of the site away from any existing manholes or gullies. Fuelling and lubrication of equipment will only be carried out in a designated area of the site away from any existing manholes or gullies. At present, it is proposed that fuel and lubricants will be stored adjacent to the office compound. Bunds will have regard to Environmental Protection Agency guidelines 'Amendment to IPC Guidance Note on Storage and Transfer of Materials for Scheduled Activities' (EPA, 2013c). 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. This bunded area will be roofed appropriately to exclude rainwater. Mobile fuel bowsers may be used for refuelling heavy equipment. Bowsers used will be double skinned and spill kit/drip tray equipment will be used during refuelling which will take place away from any nearby drains or watercourses and from any surface water drainage gulley's (Tobin Consulting Engineers, 2023a).	

Potential Impact	Construction	Operation
	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. As outlined in the CEMP (Tobin Consulting Engineers, 2023a), 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. **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 Contractor and in accordance with the CEMP (Tobin Consulting Engineers, 2023a) and relevant industry standards. All ready-mixed concrete will be delivered to the site by truck. Concrete mixer trucks will not be permitted to wash out on-site with the exception of cleaning the chute into a container which will then be emptied into a skip for appropriate compliant removal offsite. A suitable risk assessment for wet concreting shall be completed prior to works being carried out. **Emergency Procedures** In the event of an environmental incident, the appointed Project Environmental Manager will be notified immediately, and absorbent materials used to prevent the spread of the spill/leak. The contaminated materials will be transferred to leak-proof storage containers and any contaminated soils or gravels excavated and removed off-site. A record of the incident will be kept, and Westmeath County Council will be notified. Remedial action will be immediately implemented to address any potential impacts	

Potential Impact	Construction	Operation
	in accordance with industry standards and legislative requirements. ▪ Any required emergency vehicle or equipment maintenance work will take place in a designated impermeable area within the site; ▪ Emergency response procedures will be put in place, in the unlikely event of spillages of fuels or lubricants; ▪ Spill kits including oil absorbent material will be provided so that any spillage of fuels, lubricants or hydraulic oils will be immediately contained; ▪ In the event of a leak or spill from equipment in the instance of a mechanical breakdown during operation, any contaminated soil will be removed from the site and compliantly disposed 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 for in the event of accidental fuel spillages; and ▪ All construction works staff on-site will be fully trained on the use of equipment. This procedure will be undertaken in accordance with industry best practice procedures and standards. These measures will ensure that there is minimal risk to the receiving hydrology and Hydrogeology 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. Portaloos will be provided in the compound initially, with a dedicated toilet block installed later. All waste from welfare facilities will be managed in accordance with the relevant statutory obligations by tankering of	

Potential Impact	Construction	Operation
	waste offsite by an appropriately authorised contractor	
Monitoring	During the 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 that are protective of water quality are fully implemented and effective. ▪ Discharges to surface water / foul sewers will be monitored where required in accordance with statutory consents (i.e., discharge licence). ▪ Routine monitoring and inspections during refuelling, concrete works to ensure no impacts and compliance with avoidance, remedial and mitigation measures.	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.
EIAR Chapter 7: Air Quality		
Potential Impacts	▪ The Principal Contractor or equivalent must monitor the contractors' performance to ensure that the proposed mitigation measures are implemented and that dust impacts and nuisance are minimised; ▪ During working hours, dust control methods will be monitored as appropriate, depending on the prevailing meteorological conditions; ***Operating Vehicles/Machinery and Sustainable Travel*** Ensure all vehicles switch off engines when stationary - no idling vehicles. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable. Impose and signpost a maximum-speed-limit of 20 kph haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate). Produce a Construction Logistics Plan to manage the sustainable	No site-specific mitigation measures are required.

Potential Impact	Construction	Operation
	Preparing and Maintaining the Site ▪ Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. ▪ Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. ▪ Fully enclose specific operations where there is a high potential for dust production, and the site is active for an extensive period. ▪ Avoid site runoff of water or mud. ▪ Keep site fencing, barriers and scaffolding clean using wet methods. ▪ Remove materials that have 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. ▪ Cover, seed or fence stockpiles to prevent wind whipping. **Operations** ▪ Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems. ▪ Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. ▪ Use enclosed chutes and conveyors and covered skips. ▪ Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. ▪ Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods. **Waste Management** Avoid bonfires and the burning of waste materials.	

Potential Impact	Construction	Operation
	Measures Specific to Earthworks ▪ Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. ▪ Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. ▪ Only remove the cover in small areas during work and not all at once. ▪ During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil and thus suppress dust. **Measures Specific to Construction** ▪ Avoid scabbling (roughening of concrete surfaces) if possible. ▪ Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place. ▪ Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. ▪ For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust. **Measures Specific to Trackout** ▪ Site roads (particularly unpaved) can be a significant source of fugitive dust from construction sites if control measures are not in place. The most effective means of suppressing dust emissions from unpaved roads is to apply speed restrictions. Studies show that these measures can have a control efficiency ranging from 25 to 80% (UK ODPM, 2002). ▪ A speed restriction of 20 km/hr will be applied as an effective control measure for dust for on-site vehicles. ▪ Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the	

Potential Impact	Construction	Operation
	site. This may require the sweeper being continuously in use. If sweeping using a road sweeper is not possible due to the nature of the surrounding area then a suitable smaller scale street cleaning vacuum will be used. ▪ Avoid dry sweeping of large areas. ▪ Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport. ▪ Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable. ▪ Record all inspections of haul routes and any subsequent action in a site log book. ▪ Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned. ▪ Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable). ▪ Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits. ▪ Access gates to be located at least 10 m from receptors where possible.	
EIAR Chapter 8: Climate		
Potential Impact	Embodied carbon of materials and construction activities will be the primary source of climate impacts during the construction phase. During the construction phase the following best practice measures shall be implemented on site to prevent significant GHG emissions and reduce impacts to climate: ▪ Prevention of on-site or delivery vehicles from leaving engines idling, even over short periods. ▪ Ensure all plant and machinery are well maintained and inspected regularly. ▪ Minimising waste of materials due to poor timing or over ordering on site will aid to minimise the embodied carbon footprint of the site. ▪ Waste materials will be re-used on site where possible and where re-use is not	A number of measures have been incorporated into the design of the development in order to mitigate against the impacts of future climate change. For example, adequate attenuation and drainage have been incorporated into the design of the development to avoid potential flooding impacts as a result of increased rainfall events in future years. A number of incorporated design mitigation measures that have been incorporated into the design of the development to reduce the impact on climate wherever possible. The development will be in compliance with the requirements of the Near Zero Energy Building (NZEB) Standards and will achieve a Building Energy Rating (BER) in line with the NZEB requirements. Renewable

Potential Impact	Construction	Operation
	possible on-site they will be sent off-site for recycling, re-use or recovery. ▪ Sourcing materials locally where possible to reduce transport related CO2 emissions.	technologies will be implemented for the energy or heating requirements of the units to meet the RER of the NZEB requirements. Durable building material will be selected to prevent the need for frequent replacement or maintenance thereby reducing the embodied footprint of the development. These identified measures will aid in reducing the impact to climate during the operational phase of the proposed development in line with the goals of the Climate Change Action Plan.
EIAR Chapter 9: Noise and Vibration		
Potential Impact	In this instance the assessment within this document has found that construction noise is expected to be below the level where a significant impact is likely to occur. Notwithstanding this, the contractor will be required to ensure that all best practice noise and vibration control methods will be used to minimise noise and vibration levels. With regard to construction activities, best practice operational and control measures for noise and vibration from construction sites are found within BS 5228 (2009 +A1 2014) *Code of Practice for Noise and Vibration Control on Construction and Open Sites Parts 1 and 2.* BS5228 includes guidance on several aspects of construction site practices, including, but not limited to: ▪ selection of quiet plant; ▪ control of noise sources; ▪ screening (boundary, and or localised plant screening); ▪ hours of work; ▪ liaison with the public, and; ▪ monitoring **Noise at Source** BS5228 If replacing a noisy item of plant is not a viable or practical option, consideration will be given to noise control "at source". This refers to the modification of an item of plant or the application of improved sound reduction methods in consultation with the supplier. For example, resonance effects in panel work or cover plates can be reduced through stiffening	**Traffic** Noise mitigation measures with respect to the impact of traffic from the development are not deemed necessary. **Building Services Plant** With consideration at the detailed design stage the selection and location of plant items will ensure that noise emissions to sensitive receivers both external and within the development itself will be within the relevant criteria, therefore no further mitigation is required. **Inward Impact** At detailed design stage, glazing and vent specifications will ensure suitable internal noise levels

Potential Impact	Construction	Operation
	or application of damping compounds; rattling and grinding noises can often be controlled by fixing resilient materials in between the surfaces in contact. states that "as far as reasonably practicable sources of significant noise should be enclosed". In applying this guidance, constraints such as mobility, ventilation, access and safety must be taken into account. Items suitable for enclosure include pumps and generators. BS5228 makes a number of recommendations in relation to "use and siting of equipment". These are all directly relevant and hence are reproduced below. These recommendations will be adopted on site. "Plant should always be used in accordance with manufacturers' instructions. Care should be taken to site equipment away from noise-sensitive areas. Where possible, loading and unloading should also be carried out away from such areas. Machines such as cranes that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. Machines should not be left running unnecessarily, as this can be noisy and waste energy. Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise-sensitive areas. Attendant operators of the plant can also benefit from this acoustical phenomenon by sheltering, when possible, in the area with reduced noise levels. Acoustic covers to engines should be kept closed when the engines are in use and idling. The use of compressors that have effective acoustic enclosures and are designed to operate when their access panels are closed is recommended. Materials should be lowered whenever practicable and should not be dropped. The surfaces on to which the materials are being moved could be covered by resilient material." Other forms of noise control at source relevant to the development works are set out below:	

Potential Impact	Construction	Operation
	▪ For mobile plant items such as cranes, dump trucks, excavators and loaders, the installation of an acoustic exhaust and or maintaining enclosure panels closed during operation can reduce noise levels by up to 10dB. 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 muffler or sound reducing equipment to the breaker 'tool' and ensure any leaks in the air lines are sealed. Erect localised screens around breaker or drill bit when in operation in close proximity to noise sensitive boundaries. ▪ For concrete mixers, control measures will be employed during cleaning to ensure no impulsive hammering is undertaken at the mixer drum. ▪ For all materials handling ensure that materials are not dropped from excessive heights, lining drops chutes and dump trucks with resilient materials. ▪ Demountable enclosures can also be used to screen operatives using hand tools/ breakers and will be moved around site as necessary. ▪ All items of plant will be subject to regular maintenance. Such maintenance can prevent unnecessary increases in plant noise and can serve to prolong the effectiveness of noise control measures. **Screening** Typically screening is an effective method of reducing the noise level at a receiver location and can be used successfully as an additional measure to all other forms of noise control. The effectiveness of a noise screen will depend on the height and length of the screen and its position relative to both the source and receiver. Screening may be a useful form of noise control when works are taking place at basement and ground level to screen noise levels at ground floor adjacent buildings. In addition, careful planning of the site layout will also be considered. The use of localised mobile (mobile hoarding screens and / or	

Potential Impact	Construction	Operation
	acoustic quilts) to items of plant with the potential to generate high levels of noise are an effective noise control measure. These options will be considered when percussive works are taking place in close proximity to the nearest sensitive perimeter buildings. In particular, screening offering a reduction in noise levels of 10 dB will be required along the boundaries with the Ashfield housing area. **Liaison with Public** A designated noise liaison will be appointed to site during construction works. All noise complaints will be logged and followed up in a prompt fashion by the liaison officer. In addition, prior to particularly noisy construction activity, the liaison officer will inform residents at the nearest noise sensitive locations of the time and expected duration of the noisy works. **Hours of Work** Construction works will be undertaken within the times below, taken from the Construction Environmental Management Plan: Monday to Friday: 07:00 to 18:00hrs Saturday: 08:00 to 14:00hrs Sunday and Public Holidays: No work on site. However, it may be necessary for some construction operations to be undertaken outside these times, for example; connections to public service systems or utilities. Such works will be agreed in advance with Westmeath County Council. **Building Services Plant** Selection of quiet plant is recommended in relation to sites with static plant such as compressors and generators. It is recommended that these units be supplied with manufacturers' proprietary acoustic enclosures where possible. The potential for any item of plant to generate noise will be assessed prior to the item being brought onto the site. To facilitate this, each item of plant equipment will be required to comply with the EC Directive on Outdoor Noise Emissions 2000/14/EC. The least noisy item will be selected wherever possible.	

Potential Impact	Construction	Operation
EIAR Chapter 10: Landscape and Visual Impact		
Potential Impact	**Design Stage**: Provide a green link between the adjacent zoned Open Space and Parkland parcels, north and south of the site. This link shall be min. 10m in width and consist of mixed native species. Retain category "B2" trees within the northeast hedgerow, as a visual filter to the Open Space lands. Retain the Ash trees to the centre of the site that are in excess of 15m height, as a visual backdrop to numerous views. Retain the trees along the western boundary adjacent to the Rathgowan House laneway, as they also impact character on adjacent lands. Provide a solid buffer to the existing residences at the south end of the site. To minimise visual impact, roofing material to any structures to be non-reflective with a dark colour tone. **Construction Stage** Trees to be retained should be fenced off at the commencement of construction to the specified Root Protection Area (RPA) to avoid inadvertent felling or use of the ground under canopies for construction purposes. The attenuation zone adjacent to the R394 should be constructed early in the development and planted 6 months prior to its use as stormwater attenuation, to ensure soil settlement and vegetation establishment. Salvaged topsoil should not be stored more than 6 months if kept in piles more than 1m high. Rotate stockpiling to fit this time period, to ensure healthy aerated soil for use in the completed development.	None Proposed
EIAR Chapter 11: Material Assets Waste		
Potential Impacts	**Waste** The Contractor will be required to follow all guidelines in the PCEMP and CDOWMP (Tobin Consulting Engineers Ltd., July 2023), subject to approval by Westmeath County Council for the duration of the Construction Phase of the Proposed Development. This PCEMP and CDOWMP will contain the necessary measures for amelioration and remediation during the	**Waste** As outlined in the CDOWMP (Tobin Consulting Engineers Ltd., July 2023) for the Proposed Development, it is intended to ensure that the highest possible levels of waste reduction, waste reuse and waste recycling are achieved for the Proposed Development. Specifically, the CDOWMP will aim to achieve waste prevention,

Potential Impact	Construction	Operation
	Construction Phase of the Proposed Development	maximum recycling, and recovery of waste with a focus on diversion of waste from landfill wherever possible. The Management Company will be responsible for the provision of a leaflet to all new tenants encouraging good waste segregation and pictorial information detailing the waste streams that can be placed in each bin. In addition to this, clauses that support waste segregation targets will be included in relevant legal documentation e.g., tenancy agreements where possible. The CDOWMP also states that the facilities management company must employ suitably permitted or licenced contractors to undertake off-site management of their waste in accordance with all legal requirements. This includes the requirement that a waste contractor handle, transport and reuse / recover / recycle / dispose of waste in a manner that ensures that no adverse environmental impacts occur as a result of any of these activities
	Wastewater Specific avoidance, remedial and mitigation measures to be taken during the Construction and Operational Phase with respect to foul water and wastewater are detailed within Chapter 7 Hydrology and Hydrogeology, of this EIAR. All works will be carried out in accordance with the PCEMP/CDOWMP (Tobin Consulting Engineers Ltd., July 2023) prepared for the Proposed Development and the Irish Water Code of Practice for Water Infrastructure (July 2020) and the Irish Water Code of Practice for Wastewater Infrastructure (July 2020). Laying of watermains/wastewater sewers and testing of pipelines and infrastructure will be in accordance with Irish Water standard details	**Wastewater** It is proposed that wastewater generated from the Proposed Development will discharge to an existing 225mm ø Irish Water foul sewer which runs within the site along the southern boundary. A new manhole will be constructed on the existing sewer at the point of connection. Approximately two-thirds of the site will drain under gravity to this location. A factor of 6 times the dry weather flow was used to determine the relevant pipe requirements, with loading rates for the development in accordance with the Code of Practice for Wastewater Infrastructure (IW-CDS-5030-03) - Wastewater Flow Rates for Design (Tobin Consulting Engineers, April 2023). All flow velocities within the proposed gravity foul drainage network fall within the limits of 0.75 and 2.5m/sec as set out in Irish Water Code of Practice for Wastewater Infrastructure

Potential Impact	Construction	Operation
EIAR Chapter 12: Material Assets: Traffic and Transport		
Potential Impact	The Construction Environmental Management Plan (CEMP) includes proposed mitigation measures to minimise the impact of constructed related traffic on the modelled roads network. The construction stage of the proposed development will be complete in three phases as described in CEMP and the project is scheduled to begin construction in 2024 with an estimated duration of 83 weeks. It is envisaged that working hours will be 08:00 am to 19:00 pm Monday to Friday (08:00 am to 14:00 pm for Saturday) for construction personnel through each phase of the development. Generally, construction workers will travel to site before the measured peak hour of 08:00 to 09:00, to be on site for a 08:00 start-time. It is envisaged that a very limited number of construction employees are likely to travel to the site during peak hours. It is anticipated that heavy goods vehicles, HGV's, will be restricted to movements on the local road network during the off-peak periods. It is estimated that truck movements and general deliveries would arrive/leave at a steady rate during working hours. It is envisaged that during the busiest period onsite, namely the groundworks element of the works, an estimated 8 no. HGV's will deliver to the site daily for the duration of this work element. HGV deliveries are envisaged at other periods during the construction phase, but these are expected to be at a lower frequency. An estimated total of 610 HGV trips are envisaged throughout the course of the construction phase of the works. A number of mitigation measures are proposed during the construction phase to minimise the impact, the measures are as follows: ▪ A detailed haulage plan will be put in place to ensure minimal impact on the surrounding road network. Spoil removal from site will be kept to a minimum with a detailed site survey completed to ascertain where spoil can be distributed on the site. ▪ All deliveries and removals will be subject to stringent site rules governing the loading / off-loading times, location	Mitigation measures proposed during the operational stage are as follows: ▪ Provision of "YIELD" road markings at the roundabout access in accordance the Traffic Signs Manual (TII, 2019). ▪ Suitable Lighting of all junctions with lighting columns being positioned at the back of the footways. ▪ The connection of the proposed development footpaths to the existing footpath network on the R394. This will allow connectivity to the existing infrastructure. ▪ The provision of bicycle stands and dedicated cycle routes through the development to encourage cycling. ▪ Charging points for electric vehicles are being provided. ▪ A Mobility Management Plan has been included as part of the Traffic and Transport Assessment, submitted as part of this application. This outlines the mobility strategy for the proposed development and includes measures for guiding the delivery and management of coordinated mobility management initiatives by the scheme promotor.

Potential Impact	Construction	Operation
	of loading / off loading, covering of loads and cleaning of vehicles exiting the site, etc. ▪ Delivery loads to and from the site and management of large deliveries on site to occur outside of peak periods. ▪ No vehicle will be allowed to stop or park on the access road to the proposed development site. ▪ Ample parking will be provided within the site to cater for the staff and visitors during the construction phases of the proposed development. ▪ Construction traffic will be managed and scheduled to ensure no queueing occurs on either the internal road system or the main approach roads. The provision of an on-site vehicle staging area will facilitate waiting vehicles. ▪ Routine sweeping/cleaning of the road and footpaths in front of the site; and ▪ No uncontrolled runoff to the public road from dewatering/pumping carried out during construction activity. There will be on-going monitoring of the impact of construction traffic on the wider roads network to ensure prompt action is taken in the event of an issue arising	
EIAR Chapter 13: Material Assets: Service Infrastructure & Utilities		
Potential Impact	Wastewater contamination of groundwater and surface water: ▪ Significance of impact without mitigation: Under the normal operation of the wastewater system, the impact on surface water or groundwater quality is imperceptible. ▪ Significance of impact with mitigation: None required	Domestic waste dispersal: ▪ Significance of impact without mitigation: Ongoing and moderate to severe. ▪ Significance of impact with mitigation: Management, containment and handling of domestic waste will be undertaken strictly in accordance with the Operational Environmental Management Plan. The impact is thereby mitigated slight to imperceptible levels
	Increased risk of pluvial flooding: ▪ Significance of impact without mitigation: Short term but potentially severe.	Electrical faults: ▪ Significance of impact without mitigation: Temporary but moderate to severe.

Potential Impact	Construction	Operation
	▪ Significance of impact with mitigation: The risk of pluvial flooding is minimised by the drainage network set-up, controlled discharge rate as per the greenfield runoff-rate, gullies strategically located and the use of the retention pond for surface water storage. Designed run-off equates to that of the calculated greenfields value. The impact, therefore, is slight to imperceptible	▪ Significance of impact with mitigation: Stringent quality controls govern the design, materials fabrication and installation of this infrastructure. Causes of faults are therefore significantly limited to extraneous factors. The risk is therefore low, while the impact is moderate to high, but this is limited to the case of faults being caused by, and coinciding with, severe storm events
	Hydrocarbon pollution: ▪ Significance of impact without mitigation: Ongoing and moderate to severe. ▪ Significance of impact with mitigation: The risk of hydrocarbons and pollutants entering the natural watercourse is eliminated by the introduction of a petrol/oil interceptor prior to discharging to the attenuation tank and pond/bioswale. The impact is therefore classed as imperceptible	
	Excavation-related silt migration: ▪ Significance of impact without mitigation: Short term and slight ▪ Significance of impact with mitigation: Management of surface water runoff and subsequent treatment prior to release off-site will be undertaken during construction work. Prior to the commencement of earthwork silt fencing will be placed down-gradient of the construction areas where drains or drainage pathways are present. These will be embedded into the local soils to ensure all site water is captured and filtered. Earthworks will take place during periods of low rainfall to reduce run-off and potential siltation of watercourses. The impact is thereby mitigated slight to imperceptible levels	

Potential Impact	Construction	Operation
	Construction waste dispersal: ▪ Significance of impact without mitigation: Temporary but moderate to severe. ▪ Significance of impact with mitigation: Management, containment and handling of construction waste will be undertaken during construction work strictly in accordance with the Construction Environmental Management Plan. In the case of backfill material, a waste sampling strategy is to be employed by the Contractor to ensure all backfill material is inert. The impact is thereby mitigated slight to imperceptible levels	
	Electrical faults: ▪ Significance of impact without mitigation: Temporary but moderate to severe. ▪ Significance of impact with mitigation: Stringent quality controls govern the design, materials fabrication and installation of this infrastructure. Causes of faults are therefore significantly limited to extraneous factors. The risk is therefore low, while the impact is moderate to high in the case of faults being caused by and coinciding with severe storm events	
	Dust/Noise experienced by neighbours: ▪ Significance of impact without mitigation: Temporary and moderate. Significance of impact with mitigation: Site management will include numerous safe-working and environmental-welfare procedures (including dust-suppression) which will be monitored and enforced by various mechanisms. Construction noise will be periodic, generated only for the minimum period required and only during working hours	

Potential Impact	Construction	Operation
EIAR Chapter 14: Biodiversity		
Potential Impact	**Protection of Habitats** Trees that are proposed to be retained on Site (as per the tree protection plan accompanying this application, Drg. No. M-TS-001) will be protected for the duration of the Construction Phase by protective fencing, signage and/or ground protection prior to any materials or machinery being brought on Site and prior to any development or soil stripping taking place. Areas that are designated for new planting will be protected where possible. Barriers will be fit for the purpose of excluding construction activity. In most cases barriers will consist of a scaffold framework comprising a vertical and horizontal framework, well braced to resist impacts. To ensure the protective barriers are respected, clear concise signage will be affixed to the barrier in an unrestricted easily viewer location. The protective barriers will remain in place in an undisturbed condition and only removed on completion of all construction activity. Any breach of the protective fencing will be reported to the consulting arborist. During the course of the Construction Phase the integrity of the protective fencing must be respected and remain in place at all times. No building materials or soil heaps will be stored within this area. Should essential works need to take place within the root protection area, the project arborist must be informed in advance and any necessary mitigation measures will be put in place. The protective fencing will remain in situ for the duration of the project and will only be removed upon completion of all works. Construction will only commence once the protective barriers and/or ground protection have been erected. Further information on Tree Protection measures can be found in the Arboricultural Impact Assessment accompanying this application (Arbo Care, 2023). **Invasive Species** No species of plant listed on the Third Schedule of the European Communities (Birds and Natural Habitats) Regulations, 2011 were recorded at the Site during surveys. As such, no significant risk of impacts relating to the	**Wildlife Friendly Lighting** To minimise disturbance to bats in the immediate vicinity of the Site, the lighting and layout of the Proposed Development has been designed to minimise light spill. This will be achieved by ensuring that the design to minimise light spill. This will be achieved by ensuring that the design of lighting accords with guidelines presented in the Bat Conservation Trust & Institute of Lighting Engineers 'Bats and Lighting in the UK - Bats and Built Environment Series', the Bat Conservation Trust 'Artificial Lighting and Wildlife Interim Guidance' and the Bat Conservation Trust 'Statement on the impact and design of artificial light on bats'. Bat-friendly lighting measures have been incorporated into the Proposed Development design and associated lighting plan. Dark buffer zones can be effectively used to separate important habitats or features from lighting by forming a dark perimeter around them (ILP, 2018). Buffer zones rely on ensuring light levels within a certain distance of features do not exceed certain defined limits, generally 1 lux or less. The buffer zone can be further subdivided into zones of increasing illuminance limit radiating away from the feature. It is noted that the Site is currently well illuminated due to the adjacent street and residential lighting, however the inclusion of wildlife friendly lighting measures in the Proposed Development design will have a considerable input in mitigating the potential impact of additional night-time lighting on local bats. Based on the above guidance documents, the lighting scheme for the Proposed Development, as confirmed by Morley Walsh has incorporated the following measures: ▪ Luminaires will have zero upward light ratio, to minimize light pollution, energy waste and impact on wildlife.

Potential Impact	Construction	Operation
	spread of invasive plant species exists at the Site. Nevertheless, efforts should be made to remove the non-native plants on Site and minimise any risk of spread off-Site. The distribution of the non-native species recorded on Site (snowberry) is not significant and its removal will not be an issue. Transport Infrastructure Ireland (2020) guidance 'The Management of Invasive Alien Plant Species on National Roads – Technical Guidance' will be consulted with regards the treatment, removal and disposal of invasive flora at the Site. The following measures will be adhered to, to avoid the introduction or dissemination of invasive species to and from the Site of the Proposed Development: ▪ Validation that all machinery / vehicles are free of Invasive Alien Plant Species (IAPS) prior to their first introduction to Site. ▪ Certification from the suppliers that all imported soils and other fill/landscaping materials are free of IAPS. ▪ A regular schedule of Site inspections across the IAPS growing season, for the duration of the construction works. ▪ Validation that all machinery / vehicles are free of IAPS, prior to leaving the Site. ▪ Appropriate and effective Site biosecurity hygiene. **Surface and ground water protection measures** The Proposed Development includes a detailed drainage plan that is assessed in full In Chapter 6 – Hydrology & Hydrogeology of this EIAR. This drainage plan and all associated measures have been taken into account in this Biodiversity Chapter but are not included in full (to avoid repetition). The drainage design for the Proposed Development will minimise surface water runoff arising at the Site, to adequately control and manage surface water runoff from the Site containing suspended solids and to ensure that the hydrological function of the waterbodies in the vicinity of the	▪ Lighting will be directional on to the roadways and footways only with minimal spillage onto the adjoining habitats. ▪ LED luminaries are utilised where possible due to their sharp cut-off, lower intensity, good colour rendition and dimming capability. ▪ Narrow spectrum bulbs will be used to lower the range of species affected by lighting. Light sources that emit minimal ultra-violet light and avoid the white and blue wavelengths of the light spectrum will be utilised to avoid attracting lots of insects. Lighting regimes that attract lots of insects result in a reduction of insects in other areas like parks and gardens that bats may utilise for foraging. ▪ Motion sensor and timer activated lighting will be in place at the Site to ensure minimal light spill occurs during the hours of darkness. ▪ Planting will provide areas of darkness suitable for bats to feed and commute. ▪ Reflective surfaces will not be placed under lights. **Protection and enhancement of habitats** The landscaped sections of the Proposed Development will be managed in a way so as to mitigate the loss of the existing hedgerows and treelines as much as is possible. In this way new hedgerows and treelines will be maximised in the ecological value they provide at the Site, with habitat connectivity ensured along the margins of the Proposed Development. This connectivity is vital for wildlife such as birds, bats, mammals, and insect pollinators in a human landscape such as that which will be provided by the Proposed Development. Additionally, by managing hedgerows and treelines in a more natural way, they will provide more in terms of biodiversity; through increased plant diversity, increase provision of food resources and higher

Potential Impact	Construction	Operation
	Site are not affected by the Proposed Development. There are no drainage ditches or watercourses within or immediately adjacent to the Proposed Development Site however the public surface water network lies adjacent to the Site along the C-Link Road. This public surface water network eventually discharges to the River Brosna north east of the Site. As such, standard best practice surface water management measures will be implemented on Site to ensure surface water runoff from the Site containing suspended solids does not reach the public surface water network along the C-Link Road or impact the local underlying groundwater body. A number of pollution-prevention measures for the Construction Phase of the Proposed Development are described in the outline Construction Environmental Management Plan (CEMP) accompanying this application under a separate cover. All measures outlined in the CEMP are established measures that are widely used in construction projects, and there is a high degree of confidence in their success. The contractor will be required to employ an Environmental Manager to assist with preparing a detailed CEMP and its implementation. The following pollution prevention measures will be implemented on Site to protect surface water and ground water in the vicinity of the Proposed Development: ▪ The main compound on Site will include a bunded area for the storage of pollutants, with additional areas for stockpiling of materials. ▪ There will be no cement washout on Site except for washout of chutes, the washings of which will be collected into an appropriate container for compliant off-Site management. ▪ Where cast-in-place concrete is required, all work will be carried out in the dry. ▪ All plant machinery required on Site will be serviced before being mobilised to Site. ▪ Refuelling of plant during the Construction Phase will only be carried	quality shelter to wildlife inhabiting and commuting through the area. This low intervention approach may not be suitable for the more landscaped areas of the Site, which may need to be maintained to a higher degree for health and safety or aesthetic reasons. However, a high quantity of native species is included in the landscape design in these locations to maximise the biodiversity value of these internal landscaped parts of the Site. For the hedgerows running along the margins of the Site, the following management approach is proposed to maximise their biodiversity value and offset the loss of existing hedgerows and treelines at the Site: ▪ Hedgerows will be maintained with a natural meadow strip of 1-2m at their base wherever possible. Hedges with plenty of naturally occurring flowers and grasses at the base support will provide higher quality habitat for local wildlife using the hedges. ▪ The 1-2m strip at the base of the hedgerow will be cut on a reduced mowing regime to encourage wildflower growth and maximise the value of the hedgerow for pollinators. A two-cut management approach is ideal for suppressing coarse grasses and encouraging wildflowers. Cut the hedgerow basal strip once during February and March (this is before most verge plants flower and it will not disturb ground-nesting birds). Cut the verge once again during September and October (this slightly later cutting date allows plants that were cut earlier in the year time to grow and set seed). ▪ N.B. Raising the cutter bar on the back cut will lower the risk to amphibians, reptiles and small mammals. ▪ Hedgerows, where possible, should be allowed to reach at least

Potential Impact	Construction	Operation
	out at designated refuelling stations located on Site. Each station will be fully equipped for spill response and a specially trained and dedicated Environmental and Emergency Spill Response team will be appointed before the commencement of works on Site. The plant refuelling procedures will be detailed in the contractor's method statement. ▪ Spill kits will be made available in each item of plant required on Site. ▪ A regular review of the weather forecast for extremely 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. ▪ Only emergency breakdown maintenance will be carried out on Site. Drip trays and spill kits will be available on Site to ensure that any spills from vehicles are contained and removed off Site. ▪ All personnel working on Site will be trained in pollution incident control response. ▪ Any other diesel fuel or hydraulic oils stored on Site will be stored in bunded storage tanks. The bunded area will have a volume of at least 110% of the volume of the stored materials as per best practice guidelines (Enterprise Ireland, BPGCD005). ▪ All associated waste from portaloos and/or containerised toilets and welfare units will be removed from the Site by a licenced waste disposal contractor. ▪ Where there is a requirement to collect and treat surface water within the Site during the Construction Phase, run-off from the working Site or any areas of exposed soil will be channelled and intercepted at regular intervals via	2.5m in height, and should be trimmed in an A-shape; maintaining a wider base to compliment the natural meadow strip at their base. ▪ Where hedgerow trimming needs to occur delay trimming as late as possible – until January and February as the surviving berry crop will provide valuable food for wildlife. The earlier this is cut; the less food will be available to help birds and other wildlife survive through the winter. Any hedgerow cutting should be done outside of the nesting season and due consideration of the Wildlife Act 1976 (as amended) needs to be taken. ▪ Where possible, cut these outer boundary hedgerows on a minimum 3-year cycle (cutting annually stops the hedgerow flowering and fruiting), and cut in rotation rather than all at once - this will ensure some areas of hedgerow will always flower (blackthorn in March, hawthorn in May). ▪ Where they occur naturally, bramble and ivy should be allowed grow in hedgerows, as they provide key nectar and pollen sources in summer and autumn. <u>Methods to Avoid</u> ▪ Hedgerows will not be over-managed. Tightly cut hedges mean there are fewer flowers and berries, thus reducing available habitats, feeding sources and suitable nesting sites. ▪ Hedgerows will not be cut between March 1st and August 31st inclusive. It is both prohibited (except under certain exemptions) and very damaging for birds as this is the period they will have vulnerable nests containing eggs and young birds.

Potential Impact	Construction	Operation
	perimeter swales. The swales will be installed at low points around the construction areas. If required, water will be pumped from the swales into sediment bags with overflows directed to land rather than to the public surface water sewer. ▪ Discharge to land will be via a silt bag which will filter any remaining sediment from the pumped water. The entire discharge from the silt bag will be enclosed by a perimeter of double silt fencing. ▪ No pumped construction water will be discharged directly to the public surface water network along the C-Link Road. **Protection of Fauna** *Site Lighting* Site lighting may be required during the Construction Phase, to protect bats and other nocturnal fauna from excess night-time lighting, the following luminaire specifications, taken from the latest guidance (ILP, 2018) will be adhered to during the Construction Phase: ▪ Retained trees will not incur an increase in the current lux level due to Construction Phase lighting. ▪ All luminaires 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 sued to reduce the blue light component of the LED spectrum. ▪ Column heights will be carefully considered to minimise light spill, the shortest column height allowed will be used. ▪ Only luminaires with an upward light ration of 0% and with good optical control will be used. ▪ Luminaries will be mounted on the horizontal i.e., no upward tilt. ▪ External security lighting will be set on motion-sensors and short timers.	▪ Do not use pesticide/ herbicide sprays or fertilisers near hedgerows, scrub or areas of wildflower meadows as they can have an extremely negative effect on the variety of plants and animals that live there. **Bird and Bat Box Scheme** It is recommended that 10 no bird boxes will be installed as part of the landscape plan, the placement of the bird boxes will be overseen by an appropriately qualified ecologist. The boxes will be durable and will be firm and secure to their supports, and only placed on trees that are robust and large enough to support the bird box. There are various standard bird box options and at least two of each of the following box types will be installed: ▪ 'Hole type' bird box (32mm hole). ▪ 'Hole type' bird box (32mm hole) ▪ Eco Starling Nest Box ▪ 'Hole type' bird box (28 mm hole) Hole type bird boxes should be positioned 2-4m off the ground, with good-visibility, a clear flight line and away from the prevailing wind direction. Unless the areas are very sheltered, bird boxes should be fixed facing between north and south-east to avoid the hot sun and the wettest winds. Bird box placement will be directed by an ecologist and amended as appropriate. It is recommended that 10 Schwegler bat boxes will be erected on suitably large trees along the Site boundaries to provide future roosting opportunities. The guidance of a suitably qualified ecologist will be sought in the selection of bat box type and placement; to avoid disturbance from lighting generated by the Proposed Development and maximise the likelihood of their uptake by local bats. Bat boxes will be placed over 4m high (if possible) onto mature trees, the trees in which they are placed will not be illuminated. A group of 3 bat boxes facing in different directions will provide a variety of micro-habitats. **Hedgehog Highways**

Potential Impact	Construction	Operation
	Small Mammals As best practice, all construction related waste on Site e.g., plastic sheeting, netting etc. will be kept in designated areas on Site and kept off ground level to protect hedgehogs from entrapment and possible death. These measures will also act to mitigate potential negative impacts on any other small mammal species potentially utilising the Site. Trenches/ pits must be either covered at the end of each working day or include a means of escape for any animal falling in e.g., a plank or object placed in the corner of the excavation. Any temporarily exposed open pipe system will be capped in such a way as to prevent fauna gaining access as may happen when contractors are off Site. *Vegetation Clearance* Any clearance of vegetation will be carried out outside the main bird breeding season i.e., outside of the period of 1st of March to 31st of August, in compliance with the Wildlife Ace 1976 (as amended). Should any vegetation removal be required during this period, the precise location within the hedgerow/trees will be checked for birds or nests by a suitably qualified Ecologist. If encountered, the precise location with the hedgerow/treeline and the species of bird present will be recorded. The area will be protected, and the Site manager will be informed of the presence of nesting birds and advised that no works can commence in this area until further notice. Appropriate protection measures will be implemented in consultation with the project ecologist and a timeline for further surveys will be agreed based on the bird species present. Table 14-13 (within chapter 14) provides guidance for when vegetation clearance is permissible. Information sources include the Herpetological Society of Ireland, British Hedgehog Preservation Society's *Hedgehogs and Development and the Wildlife (Amendment) Act*, 2000. The preferred period for vegetation clearance is within the months of late **September and October**. Vegetation will be removed in sections working in a consistent direction to prevent entrapment of protected fauna potentially present (e.g., hedgehog,	By creating a number of separate private dwellings and associated gardens at the Site, large areas of the Site ultimately become fragmented and potentially inaccessible to species such as hedgehogs, which like to roam each night in search of food (garden pests e.g., slugs). This can be mitigated by ensuring that the boundaries and barriers within and surrounding the Site i.e., garden fencing, railings and gates are permeable for hedgehogs (Figure 14.14). This can be done by: ▪ The use of fence panels with 13 x 13 cm holes at ground level (hedgehog holes). ▪ Leaving a sufficient gap beneath gates. ▪ Leaving brick spaces at the base of brick walls. A variety of fence suppliers' stock specific hedgehog-friendly fencing options, which can be easily incorporated at little to no additional costs. These simple measures will provide habitat connectivity at the Site for small mammals and reduce the impact of the land-use change on these species. Including details of hedgehog-friendly features in the new homeowner's welcome pack will raise awareness and prevent homeowners from reversing these features, for instance blocking fence holes.

Potential Impact	Construction	Operation
	pygmy shrew). Where this seasonal restriction cannot be observed, a check for active roosts, nests and small mammals will be carried out immediately prior to any Site clearance by an appropriately qualified ecologist/ ornithologist and repeated as required to ensure compliance with legislative requirements. **Reduction of noise and dust related impacts** Short-term increases in disturbance levels as a direct result of human activity and through increased generation of noise during the Construction Phase can have a range of impacts depending upon the sensitivity of the ecological receptor, the nature and duration of the disturbance and its timing. Noise generated during the Construction Phase of the Proposed Development could cause temporary disturbance to a number of faunal species in the vicinity of the Site of the Proposed Development. The following best practise measures will be put in place to ensure the minimisation of potential impacts on fauna as a result of the Proposed Development. Limiting the hours during which Site activities likely to create high levels of noise are permitted. ▪ Establishing channels of communication between the contractor/developer, local authority and residents. ▪ Appointing a Site representative responsible for matters relating to noise. ▪ Selection of plant with low inherent potential for generating noise. ▪ Siting of plant as far away from sensitive receptors as permitted by Site constraints. ▪ Avoidance of unnecessary revving of engines and switch off plant items when not required. ▪ Keep plant machinery and vehicles adequately maintained and serviced. ▪ Proper balancing of plant items with rotating parts. ▪ Keep internal routes well maintained and avoid steep gradients. ▪ Minimise drop heights for materials or ensure a resilient material underlies.	

Potential Impact	Construction	Operation
	▪ Use of alternative reversing alarm systems on plant machinery. ▪ Monitoring typical levels of noise during critical periods and at sensitive locations. These measures will ensure that any noise disturbance to nesting birds or any other fauna species in the vicinity of the Site of the Proposed Development will be reduced to a minimum. **Reduction of Dust Related Impacts** The following general dust control measures will be followed for the duration of the Construction Phase and will ensure no significant dust related impacts occur on nearby sensitive receptors including local faunal species: ▪ Haulage vehicles transporting gravel and other similar materials to Site will be covered by a tarpaulin or similar. ▪ Bowsers will be available during periods of dry weather throughout the construction period. ▪ During dry and windy periods, and when there is a likelihood of dust nuisance, a bowser will operate to ensure moisture content is high enough to increase the stability of the soil thereby reducing the amount of dust. ▪ Stockpiles will be stored in sheltered areas of the Site, covered, and watered regularly or as needed if exposed during dry weather. ▪ Gravel will be used at Site exit points to remove caked-on dirt from tyre tracks. ▪ Equipment will be washed at the end of each workday. ▪ If practical, wheel-washing facilities will be located at all exits from the Construction Site. ▪ Dust production as a result of Site activity will be minimised by regular cleaning of the Site access roads using vacuum road sweepers and washers. Access roads will be cleaned at least 0.5km on either side of the approach roads to the access points.	

Potential Impact	Construction	Operation
	▪ Public roads outside the Site shall be regularly inspected for cleanliness, as a minimum daily, and cleaned as necessary. A road sweeper will be made available to ensure that public roads are kept free of debris. ▪ The frequency of cleaning will be determined by the Site agent and is weather and activity dependent. ▪ The height of stockpiles will be kept to a minimum and slopes should be gentle to avoid windblown soil dust. ▪ The following will be dampened during dry weather: ○ Unpaved areas subject to traffic and wind ○ Stockpiles ○ Areas where there will be loading and unloading of dust-generating materials.	
EIAR Chapter 15: Cultural Heritage and Archaeology		
Potential Impact	The pit feature identified during the 2020 programme of test trenching within the proposed development site will be subject to a full archaeological excavation in advance of construction phase works at its location (see Appendix 15.1). This mitigation measure will comply with a condition included in the previous grant of permission for a previous planning application within the proposed development site (WCC ref. 21/139) as well as the National Monuments Service's observations/ recommendations in relation to that development (see Section 15.6.8). There are no structures of architectural heritage interest or other cultural heritage assets located within the proposed development site and no mitigation measures for these elements of the cultural heritage resource are required.	All required mitigation measures will be enacted during the construction phase and, therefore, no cultural heritage mitigation measures during the operational phase of the proposed development are predicted.

Proposed Large Scale Residential Development at Rathgowan, Mullingar, Co. Westmeath

Applicant: Marina Quarter Ltd.

Volume II

Main Statement

CHAPTER 18

Screening for Major Accidents

August 2023

McCutcheon Halley
CHARTERED PLANNING CONSULTANTS

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18 Screening for Major Accidents

18.1 Introduction

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.

In assessing likely potential and predicted impacts, account has been taken of both the importance of the attributes and the predicted scale and duration of the likely impacts. Section 8 of Annex IV of the EIA Directive specifies that the EIAR must include:

> *"A description of the expected significant adverse effects of the project on the environment deriving from the vulnerability of the project to risks of major accidents and/or disasters which are relevant to the project concerned. Relevant information available and obtained through risk assessments pursuant to Union legislation such as Directive 2012/18/EU of the European Parliament and of the Council or Council Directive 2009/71/Euratom or relevant assessments carried out pursuant to national legislation may be used for this purpose provided that the requirements of this 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 such emergencies".*

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.

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.

18.2 Expertise & Qualifications

This chapter of the EIAR has been prepared by Saoirse Kavanagh, Executive Planning Consultant of McCutcheon Halley Planning Consultancy. Saoirse holds a bachelor's degree in Arts (International), majoring in Geography, and a Master's in Planning and Sustainable Development. She has over 4 years' experience working with multi-disciplinary teams and has provided input into a variety of projects. In particular, she has co-ordinated the preparation of the following three Environmental Impact Assessment Reports (EIARs) including the completion of the Introduction, Alternatives, and Population and Human Health chapters.

- Cooldown Commons Strategic Housing Development, Citywest, Dublin.
- Parkside 5B Strategic Housing Development, Belmayne, Dublin.
- Clonattin Strategic Housing Development, Gorey, Co. Wexford.

18.3 Proposed Development

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

18.4 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.

18.4.1 Relevant Legislation & Guidance

The assessment has been carried out generally in accordance with the following guidelines:

- 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);
- HSA 'A Short Guide to the European Communities (Control of Major Accident Hazards involving Dangerous Substances) Regulations, 2006 (S.I. No. 74 of 2006)' and;

- National Roads Authority (NRA) 'Guidelines on Procedures for the Assessment and Treatment of Hydrology for National Road Schemes' (2009).

18.4.2 Site Surveys/Investigation

The collection of baseline regional data was undertaken by reviewing the following sources:

- Office of Public Works (OPW) flood mapping data (www.floodinfo.ie).

Site specific data was derived from the following sources:

- Civil Works Design Report. Proposed Residential Development, Rathgowan, Mullingar, Co. Westmeath, completed by Tobin Consulting Engineers and submitted with the application.
- Various site plans and drawings

18.4.3 Consultation

The Health and Safety Authority (HSA) were contacted in June 2023 regarding the proposed development and were notified that an EIAR was being completed. The Authority did not provide any feedback in relation to the proposed development or the content of the EIAR.

18.5 Difficulties Encountered

There were no difficulties encountered during the compilation of this chapter.

18.6 Baseline Environment

The description of the proposed development is presented in detail in Chapter 2 – Project Description. The subject site is surrounded by established residential areas (to the east, north and south) and agricultural lands (to the west). It is located in close proximity to Mullingar town centre and served by public transport on the Ashe Road. The density of the proposed development attempts to optimise the number of units in accordance with current planning policies, while respecting the scale and amenity of the adjoining context.

The proposed scheme intends to create distinctive neighbourhoods, each of which are intended to have a different character via a mix of units and materials. The proposed layout of the streets and design of the buildings will create a high-quality residential environment which contributes to and completes the residential character of the area.

The permitted Phase 3 comprises construction of 213 houses, within a site area of c. 8.27 ha. The current application relates to Phase 1 and 2 which will provide a further 181 no. units. A total of 394 no. units will be provided across the three phases. Chapter 2 Project Description provides further details on the application.

The study area measures 13.58 ha, and is located at Rathgowan, Mullingar, Co. Westmeath to the northwest of Mullingar Town Centre. Access is from the C-Link Road via an existing roundabout. The site is bound by the residential developments to the southeast and northwest.

It is proposed to construct a Residential Development with associated services, access roads and car parking at the proposed site. The site is currently greenfield and is situated off the C-Link Road to the northwest of Mullingar Town. The proposed construction is envisaged to consist of conventional foundations and pavement make up with some local excavations for services and plant.

18.6.1 Site Description

The site is currently a green field site. The site is located within a mainly residential area.

The subject site is currently zoned residential under the Westmeath County Council's Development Plan and Mullingar Local Area Plan and is surrounded by suburban housing generally built at a low to medium density. The neighbouring areas generally comprise two-storey residential buildings arranged around central green spaces in distinct neighbourhoods.

The site comprises open grassland and scrub with some hedgerow/treeline borders. Mature deciduous trees and smaller trees, hedgerows, & perimeter planting will be retained where possible - gorse and scrub will be removed as required.

The site is free from structures on the Record of Protected Structures and is not located within an Architectural Conservation Area (ACA). There are no sites on the Record of Monuments and Places (RMP) within the development area. The site is also not within a Special Area of Conservation (SAC) or a Special Protection Area (SPA).

18.6.2 Flood Risk

A desktop study of the flood history at the site was carried out by Tobin Consulting Engineers (2022). There are no records of any flooding in this area of Mullingar in the OPW's floodinfo.ie database of maps and the development lies outside all flood zones shown in the Local Area Plan for the Mullingar Municipal District.

Map information for river and coastal flood events were viewed for the proposed site. The river flood map for low, medium and high probability fluvial flood events were assessed. The map confirms that neither fluvial nor coastal flood risk is not a concern for the proposed development.

The information reviewed during the Stage 1 Flood Risk Assessment identifies that there is no risk of flooding to the proposed development. As there is no risk of flooding a Stage 2 - Initial Flood Risk Assessment and Stage 3 - Detailed Risk Assessment was not required for the proposed development.

18.6.3 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.

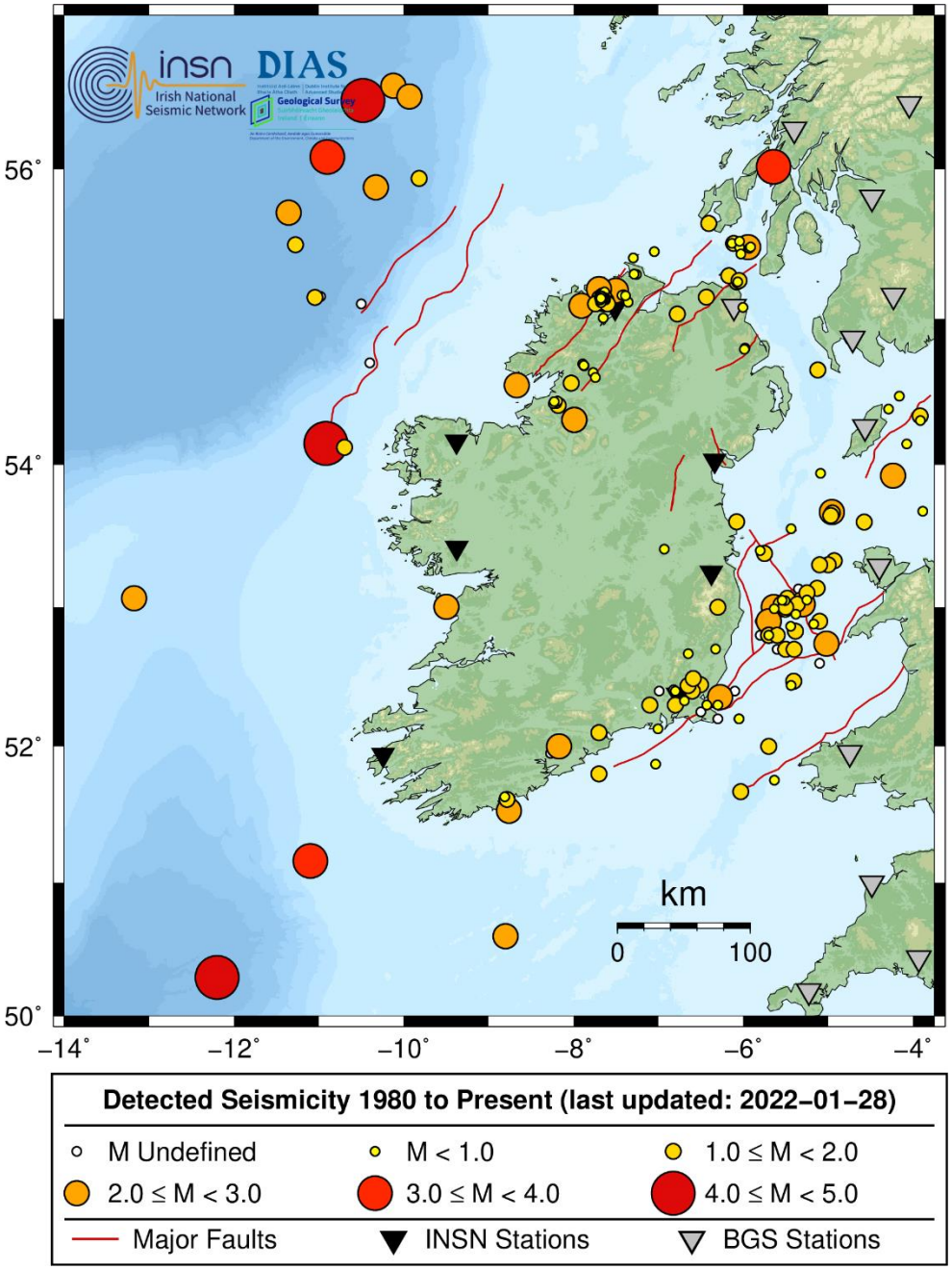

Figure 18.1 Seismic Movements. Source: Irish National Seismic Network. Y

As can be seen in Figure 18.1, 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 Mullingar site.

18.6.4 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.

The are no SEVESO sites in close proximity to the proposed development. The nearest Seveso site is ECOLAB Irl. Which is a 'lower tier establishment' located over two kilometres from the proposed development at Forrest Park, Mullingar Industrial Park, Mullingar, Co. Westmeath. The activity on site is described in the HSA's 'Public Information material required by Regulation 25, as "General Chemicals Manufacture" and is considered low risk i.e., the advice in the event of a major accident is that "*members of the public are advised to go indoors, stay in and tune to local radio*."

Given the low risk and 'lower tier' nature of the ECOLAB Irl. 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.

18.7 The 'Do nothing' Scenario

The site will remain as underutilised greenfield area.

18.8 Potential Significant Effects

18.8.1 Construction 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.

18.8.2 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.

Therefore, the impact is considered to be long term, imperceptible and neutral.

18.8.3 Cumulative Effects

Cumulative impacts are considered imperceptible and neutral.

18.9 Mitigation

18.9.1 Construction Phase Mitigation

No mitigation measures necessary.

18.9.2 Operational Phase Mitigation

No mitigation measures necessary.

18.9.3 Cumulative Mitigation

No mitigation measures necessary.

18.9.4 Monitoring

No monitoring is proposed.

18.10 Residual Impact Assessment

18.10.1 Construction 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.

18.10.2 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.

Therefore, the impact is considered to be long term, imperceptible and neutral.

18.10.3 Cumulative Impact

Cumulative impacts are considered imperceptible and neutral.

18.11 References & Sources

- 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).
- Civil Works Design Report for Residential Development at Rathgowan, Mullingar, Co. Westmeath, prepared by Tobin Consulting Engineers.
- HSA 'A Short Guide to the European Communities (Control of Major Accident Hazards involving Dangerous Substances) Regulations, 2006 (S.I. No. 74 of 2006)'.
- Flood Risk Assessment for Residential Development at Rathgowan, Mullingar, Co. Westmeath, prepared by Tobin Consulting Engineers.