Castletreasure

CARR'S HILL / CARRIGALINE ROAD, CO. CORK

VOLUME 3

Non-Technical Summary

Environmental Impact Assessment Report (EIAR

CAIRN PLC

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1.0 INTRODUCTION

1.1 Context

This is a Non-technical summary (NTS) of the Environmental Impact Assessment Report (EIAR) prepared for a proposed Residential development at Castletreasure, Carr's Hill, Co. Cork. The EIAR is provided as Volume 1, including appendices and Volume 2 (Appendix 6.1 – Site Investigation Results). This NTS is Volume 3 of the EIAR.

Cairn Homes is applying for planning permission for a development at Castletreasure, Carr's Hill, Co. Cork, on lands outlined in red in Figure 1.1. The proposal is for 472 dwelling units, a crèche, and ancillary site development works and landscaping. A more detailed project description is provided in Section 2 of this NTS.

1.2 The Applicant

Cairn is an Irish homebuilder founded in 2014 with a clear strategy to deliver high quality new homes with an emphasis on design, innovation and customer service. Cairn is led by a highly experienced management team with a proven track record in delivering high quality residential properties at scale in Ireland and the UK, supported by a high calibre and experienced wider team. Cairn is committed to working with national and local government, and other state bodies, to meet the changing housing needs of Ireland, and ensure the timely delivery of functioning, sustainable residential communities.

1.3 Need for the Scheme

The Ballincollig Carrigaline Municipal District Local Area Plan 2017 (BCMD LAP 2017) has estimated a need for an additional 1,285 dwelling units to be provided up to 2023. The proposed development is in accordance with the zoning objective contained in the BCMD LAP 2017 (Medium A residential development), and national density guidelines, as detailed in the Statement of Consistency, which accompanies the planning application. The proposed development will provide 472 no. dwelling units to serve the planned growth of Cork City South Environs to 31,308 people by 2022. The proposed development represents approximately 37% of the units identified by Cork County Council as needed in Cork City South Environs up to 2023.

The proposed development will make a significant contribution to addressing the current shortage of housing supply in Cork, including shortage of social housing. In line with the requirements of the Planning and Development Act 2000 (as amended), ten percent of the housing units will be transferred for social housing. This will provide for the transfer of 47 no. social housing units.

Figure 1.1: Aerial View of Proposed Residential Development Site

1.4 Purpose of the EIAR

Environmental Impact Assessment (EIA) is a procedure under the terms of European Directives for the assessment of the effects of development projects on the environment. An Environmental Impact Assessment Report (EIAR) is a statement prepared by the developer, providing information on the significant effects on the environment based on current knowledge and methods of assessment. It is carried out by competent experts, with appropriate expertise to provide informed assessment on their discipline.

The primary objective of the EIAR is to identify the baseline environmental context of the proposed development, predict potential beneficial and/or adverse effects of the development and propose appropriate mitigation measures where necessary.

1.5 Requirement for an EIA

Schedule 5 of the Planning and Development Regulations 2001 (as amended) sets out a comprehensive list of project types and development thresholds that require a mandatory Environmental Impact Assessment.

The proposed development falls within Part 2, Article 10 of the Regulations: Infrastructure Projects. Sub-sections (b) i and (b) iv apply in this instance and provide that a mandatory EIA is required for developments which provide for:

(b) i Construction of more than 500 dwelling units;

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

The proposed development is for 472 dwelling units, on a site area of c. 22 hectares. A mandatory EIA is therefore required under the provisions of Part 2, Article 10 (b) iv.

1.6 Structure of the EIAR

The project managers for the proposed development are Cairn Homes; project architects Meitheal Design Partners; consultant Engineers and traffic Engineers are J B Barry & Partners. McCutcheon Halley Planning Consultants (MH Planning) are the planning consultants and project co-ordinators of the EIAR. The EIAR structure and consultant responsible for each of the chapters is as follows:

Chapter	Prepared By
1. Introduction	McCutcheon Halley
2. Project Description	McCutcheon Halley / Meitheal Design Partners (MDP) and J B Barry and Partners Ltd
3. Alternatives Considered	Meitheal Design Partners and J B Barry and Partners Ltd
4. Landscape	Aecom
5. Material Assets	
5.1. Roads & Traffic	J B Barry and Partners
5.2. Services Infrastructure	J B Barry and Partners
6. Land & Soils	J B Barry and Partners
7. Water	J B Barry and Partners
8. Biodiversity	Kelleher Ecology Services
9. Noise & Vibration	AWN
10. Air Quality & Climate	AWN
11. Cultural Heritage	John Cronin & Associates
12. Population & Human Health	McCutcheon Halley
13. Significant, Interaction of & Cumulative Impacts	McCutcheon Halley
14. Summary of Mitigation Measures	McCutcheon Halley

1.7 Consultation

Relevant statutory agencies and stakeholder groups were formally consulted during the preparation of the EIAR and responses were received from Transport Infrastructure Ireland (TII); Health Services Executive (HSE) and Inland Fisheries Ireland (IFI). The comments received are detailed in the EIAR and were considered by the design team in the preparation of the planning application and EIAR.

The planning application will be decided directly by An Bord Pleanála, under special planning arrangements for Strategic Housing Development. There was extensive consultation with Cork County Council during the pre-planning stage of the development. The County Council will provide reports to An Bord Pleanála to inform the Board's decision-making process.

In addition to consultation with the prescribed bodies and Cork County Council, the applicant has engaged with local stakeholders, including residents of adjacent properties (namely the detached dwellings along the laneway north of the Vicarage and the dwellings east of the proposed access onto the R609), representatives from the Vicarage, Temple Grove and Berkeley estates, representatives of the Douglas GAA Club, Douglas Rugby Club, the Educate Together Primary School, local Councillors, and the owner of the Darraglynn Nursing Home to the north of the site.

1.8 Cumulative Impacts

In assessing the impacts of the proposed development, the EIAR took into account the following projects in terms of their potential cumulative impact.

Reference	Proposal	Status
Ha 0053	M28	Approved by ABP. Judicial Review of decision underway. Hearing due to be held on 26th February 2019.
Part 8 pending	Ballybrack Greenway Extension	Detailed design being progressed by Cork County Council
18/5369	24 class-room Primary School	Approved by Cork County Council in October 2018. Appealed, with decision due 19th March 2019.
18/5814	Lidl Discount shop and 5 apartments. c. 1.8 km north on the R609.	Approved by CCC, September 2018.
18/6245	48 residential units at Clarendon Brook. c. 0.8 m north on the R609.	Approved 19 December 2018. First party appeal – due for decision by ABP on 29 May 2019.
18/6246	600 pupil secondary school. c. 1.5 km north on the R609.	Live planning application. Further information requested in October 2018.
16/07271	200 residential units at Maryborough. c. 0.5m to the south east, separated by the N28.	Approved November 2017.

2.0 PROJECT DESCRIPTION

Chapter 2 of the EIAR provides a description of the proposed site and project and outlines the scope and proposed phasing of the construction work involved in the proposed development. The chapter outlines details of a draft Construction Environmental Management Plan, which will avoid, reduce or mitigate negative impacts that may arise during the Construction process.

2.1 Existing Site

The proposed development site is located within the South Environs of Cork City, approximately 1.2km south of Douglas Village, off the Carr's Hill Road, which connects the village to the N28 Carrigaline road. It lies 3.5km southeast of Cork City. Douglas Golf Club and the Maryborough Woods housing development site are located on the opposing hill to the north east. Ballybrack Woods extend along the western boundary between the site and the developed lands at Donnybrook Hill.

The site is partially in agricultural use, to the south & west, the lands to the north & north east of the site are overgrown along the stream and along the boundary to the R609 Carrigaline Road / Carr's Hill. Lands to the south of the subject site are also in agricultural use.

Access to the site is primarily from the R609 Carrigaline Road / Carr's Hill and the proposed junction and access road will be consistent with that proposed as part of the proposed primary school (Cork County Council plan file 18/5369, currently under appeal).

2.2 Development Description

The proposed development consists of 472 no. residential units, a creche and ancillary site works and landscaping. The residential units are broken down as follows:

- 234 no. semi-detached and terraced houses consisting 67 no. 4 bed units and 167 no. 3 bed units,
- 238 no. duplexes/apartments including 76 no. 1 bed units, 123 no. 2 bed units and 39 no. 3 bed units.

The site layout is provided in Figure 2.1, refer to drawing no. 18205-PLA-000 accompanying the planning application for detail.

Volume 1, Appendix 2.1 of the EIAR provides a schedule of the residential accommodation.

2.3 Outdoor Amenity & Recreation

The development also includes several play areas, active amenity spaces and circa 4.4 ha of landscaped parkland which runs northwest to southeast through the site. A section of the Ballybrack Greenway is also provided within the parkland which will connect to the existing Cork County Council cycle network at the site's western boundary via the existing Irish Water Pumping Station compound, and to the future expansion of the Greenway towards Maryborough at the site's eastern boundary. Details of the landscape strategy are provided in the Landscape Strategy Report, prepared by Aecom, and accompanying landscape drawings (reference nos. 60577778-SHT-20-0000-L-1000 to 1003). The key highlights of the landscape strategy are:

- The retention and supplementing of existing vegetation.
- The retention and protection of the existing Douglas and Moneygurney River courses.
- The development of green walls.
- A variety of landscape walks and trails.
- Parklets inclusive of plan opportunities.

2.4 Construction Activities

When considering a development of this nature, the potential sediment runoff, dust, noise & traffic impact on the surroundings must be considered for the construction phase. The construction phase will involve the preparation of the site, excavation and removal or infilling and reuse of on-site material, construction of site roads and building of the proposed residential houses. With the construction activity there will be an increased number of vehicular movements in the locality, both construction and worker vehicles. The construction at the site will also have the potential of causing surface water runoff, or raising dust into the air and depositing or spilling material on adjoining roads during the construction works. Noise will also be emitted from the construction site during the works. The flow of vehicular traffic to and from a construction site is also a potential source of noise levels. The potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces.

The most significant constraint is the existing residential development surrounding the site, as well as the M8 motorway. The potential construction effects include noise and air blown dust being emitted from the site in these directions.

Alongside these general activities there will also be an amount of construction waste generated. The excavation of foundations and trenches for ductwork and sewers may require the removal of some rock underlying the site. The contractor will select the method of rock removal; however, it is likely the volume of rock to be removed will be localised, and rippable by an excavator, with rock breaking not likely to be required. The design strives to ensure that as much as possible excavated top soil, sub-soil and rock material from the site will be re-used on site, minimising movements of earthworks vehicles in and out of the site.

The above items detail the potential impacts that may be experienced from the general construction activities of a development of this nature. The proposed Construction Management Plan details measures to avoid, reduce or mitigate these potential impacts.

The Construction Management Plan has been prepared to support, avoid, reduce or mitigate construction impacts arising from the proposed development. It provides details of the intended construction practice for the development, the proposed hours of working, noise management measures, and demonstrates how environmental impacts are minimised during the construction phase of the development. Finally, the site compound location, construction traffic routes and parking proposals of workers along with general site considerations are outlined.

Figure 2.1: Site Layout

The Construction Management Plan is necessarily broad at this stage and more detailed site-specific measures will be developed and agreed with the Planning Authority prior to the commencement of the permitted development and considering any conditions attached to a grant of this planning permission from An Bord Pleanála.

3.0 ALTERNATIVES CONSIDERED

Several layouts and bridge design options have been considered during the design process. The Planning & Design Summary and Statement of Consistency which accompany the planning application provide a detailed planning rationale for the development of the final layout.

Chapter 3 of the EIAR provides a summary of the layouts and design proposals and reasons for selection of the proposed development. In terms of environmental impacts, the design has been informed by:

- Providing an appropriate density to achieve sustainable development of the lands;
- Minimising the amount of cut and retaining structures within the site;
- Minimising impacts to the existing trees and hedgerows within the site;
- Minimising impacts to the riparian zone and green-way;
- Minimising impacts on watercourses;
- Establishing effective root protection zones for existing trees;
- Providing biodiversity corridors within the layout;
- Providing high-quality landscaping and recreational space for future residents; and
- Minimising the visual impacts of the proposed development.

4.0 LANDSCAPE AND VISUAL IMPACT

4.1 Introduction

Chapter 4 of the EIAR, prepared by AECOM, assesses the proposed development at Castletreasure in terms of landscape and visual impact.

The landscape and visual impact assessment describes the potential effects on the landscape character and on views from public roads, other sub-urban developments and designated landscapes arising from the proposed residential housing development at Castletreasure, County Cork.

The methodology used for the assessment follows best practice industry guidelines. It also refers to Cork County Development Plan 2014 and Cork County Draft Landscape Strategy 2007 for existing descriptions of landscape character, designated landscapes and the location of scenic routes.

4.2 Receiving Environment / Baseline Description

Site surveys assessed the character of the landscape and the most sensitive features and views.

The site is located at Carrs Hill, Douglas, approximately 1km south from Douglas village at the southern fringe of large scale suburban developments. The study area of 2km radius from the proposed development site boundary is located within undulating topography with steep hills and narrow valleys. The land slopes downhill to the north until reaching the Douglas River estuary. The R609 / Carrigaline Road runs to the east of the site and connects to the N28. The 'Vicarage' housing development and a number of detached houses are located to the north / north-west of the site and are accessed from the R609. Ardarrig and Maryborough Woods housing estates are located further north of the site (circa 500m). Douglas Pitch and Putt is located approximately 350m north of the proposed development. Douglas Golf Club is located approximately 500m (centre to centre of sites) northwest of the Proposed Development. The lands to the west are an established and large suburban residential housing area (Donnybrook), while the lands immediately to the south are identified as Strategic Land Reserve (SLR). It is likely that at least part of the SLR site will be zoned for residential development in the short to medium term. The lands are in a valley that falls to the north and west. Two streams run along wooded valleys to the west, north and northeast of the site converging within the site and join the Douglas Estuary further north. Existing bands of hedgerows and trees or clusters of trees mark the field boundaries of the site which continues south.

4.3 Potential Landscape and Visual Effects

Potential effects are separated into landscape and visual. Landscape effects are the result of physical changes to the fabric of the landscape resulting from new development. Visual effects relate closely to landscape effects but concern changes in views. Twelve photomontages have been produced as a tool to support the landscape and visual impact assessment.

4.3.1 Effects at Construction

Generally, construction effects will be temporary, short term effects which occur during the construction phase only. Areas experiencing visual effects during the construction stage will vary considerably, depending on the active construction phase.

Landscape and visual effects during the construction stage will be experienced from locations with views of the Proposed Development site and along the roads where construction traffic will travel. Existing intervening vegetation will partially screen site clearance, earthworks, construction compounds, construction works and associated machines moving on the construction site. The removal of vegetation during site clearance and earthworks will be a permanent effect.

Effects arising during construction will result from machinery, personnel, excavations, traffic and material movements. Landscape and visual effects will be highest within 500m radius from the Proposed Development site boundary. The visibility of construction works within the wider study area (beyond 500m from the Proposed Development boundary) is limited and may include the upper sections of machinery (for example cranes or containers).

4.3.2 Landscape Effects

The landscape character at the location of the Proposed Development will change from rural agricultural to a suburban residential, which is considered adverse and significant. However, the Proposed Development aims to retain a significant number of existing trees on site. A detailed landscape masterplan includes the retention of existing vegetation and proposes new planting to supplement the site with additional woodland, hedges and parkland trees. This will help the integration of the Proposed Development into its neighbourhood.

In the context of the wider area, the Proposed Development will be perceived in conjunction with nearby existing large scale residential developments, which are located to the north, east and west of the site across valleys and hills. The Proposed Development will be seen as an extension of the suburban border further to the south. Therefore, the Proposed Development will not be in contrast with the existing overall landscape character of the study area. The proposed development will result in an intensification of the suburban character already prevailing in the eastern, western and parts of the northern study area. The Proposed Development will be seen as an extension of the suburban fringe further to the south. This effect will be reinforced if lands immediately to the south, identified as Strategic Land Reserve (SLR), will be zoned for residential development in the short to medium term.

The change in landscape character will be greatest when seen from immediate and nearby surroundings (up to 300m radius from the site boundary). The development will introduce additional suburban elements to the area at elevation. The significance of landscape effects will reduce quickly with approximately 300-500m distance from the site boundary, due to intervening vegetation, topography and built structures.

Changes to the landscape character in the remaining study area, beyond approximately 500m are considered not significant. While a change in landscape character may be noticeable in the distance, particularly from elevated locations, the Proposed Development will be seen in conjunction with other existing similar developments. It will integrate therefore into the existing suburban landscape character particularly in views from the north, west and

east. Alterations in views from the south are mainly screened by intervening vegetation and topography. The Proposed Development will therefore not result in a change or modification of the wider landscape character.

4.3.3 Visual Effects

The Proposed Development is located on an elevated and sloping agricultural site. Existing vegetation can quickly provide partial or full screening to receptors when moving away from the site due to the undulating topography of the surrounding landscape.

The majority of significant views will be experienced from locations in close proximity and at elevation, up to approximately 300-500m radius.

Visibility resulting in significant effects from locations along the local road network within the study area will be limited to areas in close proximity to the development site as views will become quickly partially or fully obstructed by intervening building structures, vegetation or topography when moving further away from the site.

Existing large residential housing estates are located in the immediate setting of the Proposed Development. Likely locations experiencing significant effects will be those with views of the site from Maryborough Ridge, Maryborough Woods and Donnybrook. Views of the Proposed Development will also open from areas within Douglas Golf Club. Visibility from the national (N28, N40) and regional road network (R609, R610, R851) located within the study area will be mainly fully or partially screened by intervening vegetation and topography. However, sections of the R609 will experience open views when passing the north-eastern site boundary. Short intermittent and partially screened views of the Proposed Development will be experienced from the N28 when passing the junction with the R609.

Long distance views from the wider study area, beyond 500m and further, will likely be possible from elevated locations or tall buildings as far as from Cork City. However, considering the distance to the Proposed Development and existing sub-urban developments including housing estates adjacent to the proposal, the development will only form a small part in overall wide, panoramic views. The visual effects are therefore not considered significant as the proposal will integrate into the prevailing existing urban / sub-urban character of available views.

Cork County Development Plan 2014 identifies a number of scenic routes. None is located within the 2km study area radius. The nearest scenic route (S55) is located approximately 2.5km north-east of the Proposed Development site. Due to the distance, this route will not be affected by the Proposed Development.

4.3.4 Cumulative landscape and visual effects

Cumulative landscape and visual effects occur where the proposed development will be visible together with other similar developments.

The following 3 similar developments are located within the 2km study area and result in cumulative effects:

- **24 Class-Room Primary School development (adjacent to north-eastern site boundary)**

  The proposed primary school will be located adjacent to the Proposed Development resulting in combined views. Both developments could be seen as part of each other in the emerging new suburban context of the area. Cumulative effects are considered moderate and significant as the visibility of both developments together will increase the prevalence of suburban development / character in available views.

- **48 residential units at Clarendon Brook development (approx. 0.8 km northwest along the R609)**

Combined views of the Proposed Development and the Clarendon Brook development will be possible from sections along Carrigaline Road / R609. Cumulative effects will not be significant as both developments will be seen in conjunction with surrounding existing residential housing estates.

- **200 residential units at Maryborough Ridge (approx. 500m to the southeast)**

  Combined views of the Proposed Development and the permitted development will be limited to long or middle distance views from elevated locations. Cumulative effects will not be significant as both developments will be seen in conjunction with surrounding existing residential housing estates. Sporadic views will be experienced when travelling along the N28, in the vicinity of the junction with Carrigaline Road / R609. However, the viewer will need to turn its head to see either one or the other development.

The following 2 developments have been identified, which are not similar to the proposed development at Castletreasure, but merit a cumulative assessment due to their location.

- **Greenway Improvements development**

  Sections of the proposed Greenway are located within the Proposed Development site. They will be located within a valley along the eastern and north-eastern side. A proposed bridge into the proposed Castletreasure development from Carrigaline Road will traverse the proposed Greenway. The Greenway alignment will remain largely unaffected. Linkages to the proposed development are planned in order to connect both developments with each other.

  The Castletreasure development includes a number of footpaths and walking routes through the various parts of the estate. Therefore, there will be cumulative effects resulting from the intervisibility of both developments, particularly at proposed connecting points between both schemes and where the proposed bridge will traverse the Greenway. The significance of the intervisibility between both developments will be moderate. The interconnection of both developments is positive as it provides an opportunity to integrate both developments together enhancing the nature, character and amenity value of the subject site.

- **M28 development**

  Combined views of the proposed M28 development and the proposed Castletreasure residential development will likely increase following the construction of the M28 due to substantial earthworks and vegetation removal required to facilitate the M28 junction with the R609. Views of the Proposed Development will be available for a longer stretch when travelling along the M28 at this section. However, considering the different nature of the both developments and the separation between both there will be no cumulative effects resulting from the intervisibility of both developments.

4.4 Mitigation Measures

The principal mitigation for the proposed development is inherent in the design of its architecture, public realm, greeN infrastructure and open space, which has evolved through an iterative process of assessment and consultation. A full set of the landscape master planning as well as a Green Infrastructure Landscape Strategy design rationale is included in the planning application.

Mitigation measures taken into account to minimise landscape and visual effects included:

- Retention and protection of the existing mature woodland and greenways along the site boundary. Existing trees to be retained and protected will be protected during the construction stage in accordance with recommendations contained in the Tree Survey and best practice standards for the protection of existing vegetation during construction works;
- Avoidance of most elevated portion of land as a location for tallest buildings (apartment blocks)
- Disturbance of existing vegetation will be minimised where possible. Proposed planting will help integrating the Proposed Development into the surrounding landscape, provide screening where needed, reflect vegetation patterns of local habitats, and minimise the effect on the landscape character of the area;
- Enhancement of site tree cover by introduction of additional tree and woodland planting;
- Provide a permeable design by creating connections to other amenities, such as the Ballybrack Greenway and the proposed extension;
- Appropriate new native plant species to be used throughout the scheme; and
- Landscape management and maintenance plan to be drawn up and approved up by qualified professional.

The overarching design intention is to propose open spaces designed to resemble the existing vegetative fabric of the site. Six landscape character typologies are incorporated within the design across the development site, each offering a distinct character, purpose and program. These character areas function as part of a site-wide landscape framework, ensuring suitable screening, visual and aesthetic interest, recreation and integration of the Proposed Development into its adjoining environs. These high quality amenity spaces contain trails and walks that weave through the woodland and wildflower meadows offering a contrast to the standard suburban grain that exists within other typical residential developments. Detailed descriptions of these 6 typologies are included in the Green Infrastructure Landscape Strategy.

5.0 MATERIAL ASSETS

5.1 Traffic & Transport

Chapter 5A of the EIAR details the Traffic and Transport Assessment (TTA) of the proposed development. The TTA was prepared based on TII's (formerly NRA) *'Traffic and Transportation Assessment Guidelines' (2014)* and is developed using data from commissioned traffic counts at key junctions. The purpose of a TTA is to assess the traffic impact of a development on the existing road network during both the construction and operational phases.

The proposed development (472 residential units) is located within the area of the Ballincollig/Carrigaline Municipal District Local Area Plan (LAP) which was adopted in 2017. Within this plan, it is in an area identified as the Cork City South Environs 2. Figure 5.1 illustrates an extract from the LAP which identifies the proposed site as residential under objective SE-R-06.

Prior to commencing the TTA, the scope of the assessment was agreed with Cork County Councils Traffic & Transportation Department. The project team were informed that the potential future upgrade of the N28 to a motorway should be considered as part of the assessment (also included in the LAP). The future motorway includes a full grade separated interchange (Carr's Hill Interchange) along the R609 south east of the site. As such, junctions on the existing road network and proposed road network were analysed with and without the proposed development.

Within the overall site boundary, a planning application for a primary school (624 pupils and 46 staff) has been lodged separately by the Department of Education. A previous TTA undertaken by Walterman Moylan calculated the trips to/from the proposed school and these figures have been included in the analysis of the junctions on the surrounding road network.

To determine the local traffic characteristics in the immediate and surrounding areas of the proposed residential development, a comprehensive traffic flow survey was undertaken at 6 junctions. The AM peak period was determined from the data to be 08:00-09:00 while the PM peak period was 17:00-18:00. Traffic can vary from day to day; the traffic analysis is based on 12-hour count data from a mid-week school day. Any holiday periods are avoided when carrying out traffic counts to ensure data is provided for a 'normal working/school day'.

When complete, the proposed development will have three accesses; 'Access 1' will link with the existing residential estate road from Templegrove / The Vicarage/ Berkeley and connects with the R609 to the north of the site. 'Access 2' and 'Access 3', will be situated directly off the Carrigaline Road (R609) on the eastern boundary of the site. The main vehicular entrance/exit will be via access 2 (a 3-arm signalized junction) shared with the school. The development will provide a spine road linking Access 1 and 2. Access 3 will be a standalone access for apartment blocks adjacent to the R609.

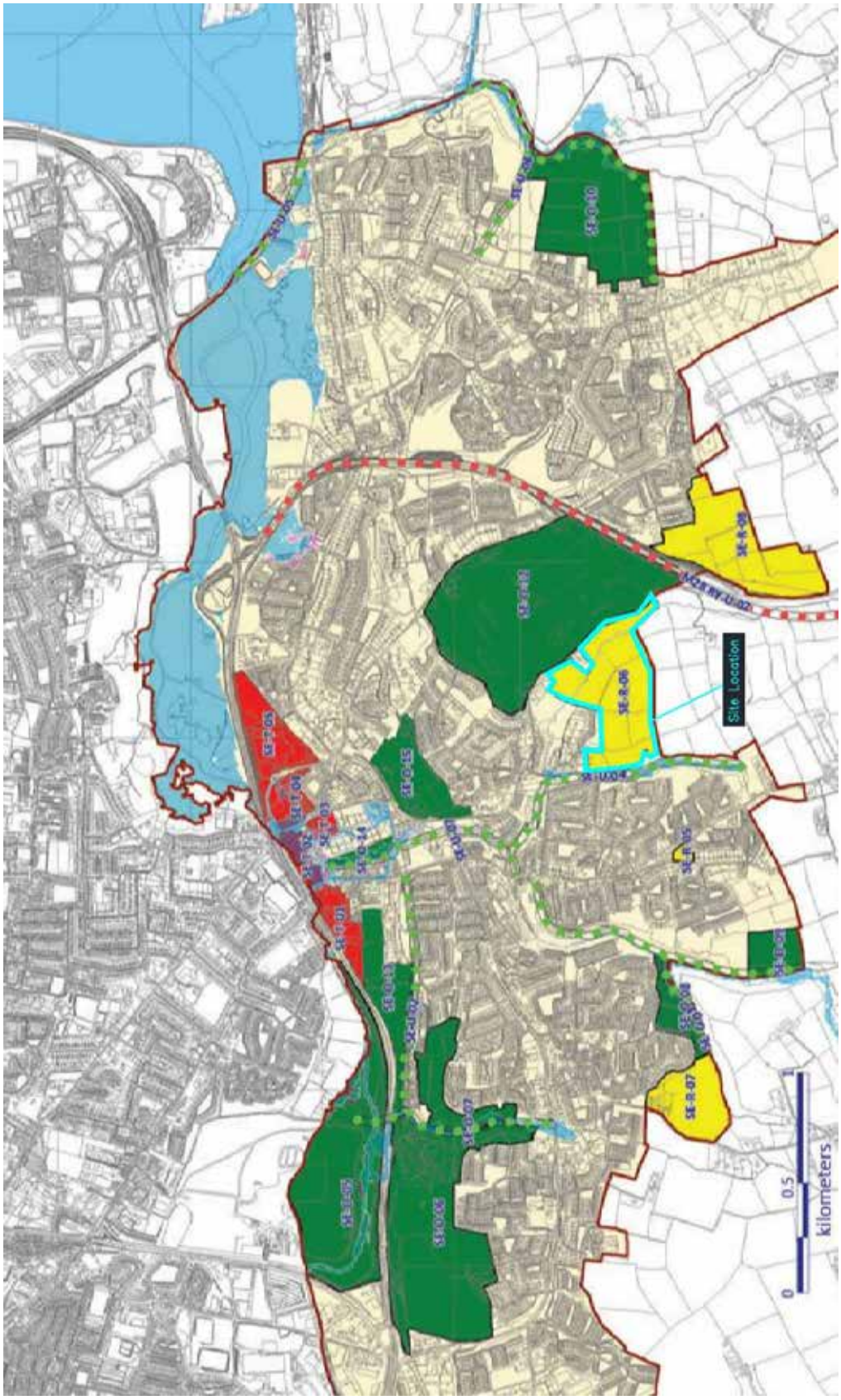

Figure 5.1: Extract from Ballincollig/Carrigaline Local Area Plan

The development takes cognizance of the Cork Cycle Network Plan by including a 4m Greenway running east-west through the site linking the existing Ballybrack Greenway and the future interurban Greenway towards Carrigaline. The development will include an integrated network of footpaths accessing all parts of the site; along with the Greenway, these facilities will provide direct access from the site to local schools and the centre of Douglas Village.

The assessment considers the phasing of the construction of the development. Following an anticipated successful planning application, the residential units will be delivered on a phased basis and it is estimated that on average, 118 residential units will be built per annum in 4 phases. With an estimated start date of Q4 2019, the projected opening year for the completed development is 2024. An assessment of the expected traffic generated during the construction stage has been completed. The highest construction trips relate to commuting workers, deliveries and supervisor trips; however, it's anticipated that these trips will occur generally outside the peak hours (morning and evening). Therefore, it's expected that the impact of the construction traffic on the surrounding road network will be slight.

Due to a number of possible future development, i.e. schools/infrastructure, four scenarios were developed for the analysis of the operational stage to account for these possible future developments.

These comprise:

- Scenario A: **No** public road improvements; with Castletreasure Primary School (incl. signalized junction); **no** Cairn Homes development; **(Base) 'Do Nothing'**
- Scenario B: **With** public road improvements (i.e. upgraded infrastructure); with Castletreasure Primary School, **no** Cairn Homes development; **(Base) 'Do Nothing'**
- Scenario C: **No** public road improvements; with Castletreasure Primary School (incl. signalized junction); **with** Cairn Homes development; **(Post Development) 'Do Something'**
- Scenario D: **With** public road improvements (i.e. upgraded infrastructure); with Castletreasure Primary School, **with** Cairn Homes development; **(Post Development) 'Do Something'**

The operational stage analysis includes the six existing junctions, new access junctions and the proposed junctions as part of future infrastructural upgrades. The analysis was undertaken using the PICADY/OSCADY/ARDCADY software packages taking 2018 as the Base Year, 2024 Opening Year, 2029 Opening Year + 5 and 2039 Opening Year +15. 'With' and 'Without' scenarios were modelled to demonstrate the impact the development traffic will have over and above normal background traffic growth.

Currently, on the surrounding road network, all link roads operate well within capacity. Post-development analysis was undertaken to determine the impact on the link roads. The results indicate that there will be a moderate increase in traffic flows, particularly on the R609, however, it is not deemed significant as the link roads continue to operate well within capacity.

The junctions which connect the road links, normally determine the network capacity in urban areas. 12 junctions (existing and proposed) were assessed to calculate the impact the proposed development would have on the surrounding junctions, both for the existing and future road layouts.

- Junction 1 – Fingerpost Roundabout;
- Junction 2 – Maryborough Woods Road/Maryborough Hill (incl. Maryborough House Hotel access);
- Junction 3 – Maryborough Hill/ N28 Slip Road (on-ramp T-junction);
- Junction 4 – Carrigaline Road/N28 Slip Road (off-ramp T-junction);
- Junction 5 – Carrigaline Road/Berkley; The Vicarage; Templegrove (**Access 1**); and
- Junction 6 – Carrigaline Road/Maryborough Hill.
- Junction 7 - The proposed signalized junction (**Access 2** - shared with Primary School);
- Junction 8 – Future M28 – Proposed Carr's Hill West Roundabout

- Junction 9 – Future M28 – Proposed Carr's Hill East Roundabout
- Junction 10 – Future M28 – Proposed MaryboroughHill/Carrs Hill Link Road
- Junction 11 – The proposed priority junction to the proposed cul-de-sac (**Access 3**); and
- Junction 12 – Possible future signalized junction linking the R609 and Grange Road.

A priority and roundabout type junction are generally said to be operating satisfactorily if all arms of the junction operate with a Ratio to Flow Capacity (RFC) value below 0.85 (Normal Design Capacity Threshold). For signalised junctions, the threshold increases slightly to 0.9. For this development, although analysis has been completed for the opening (2024) and interim year (2029), the design year (2039) is seen as the worst-case scenario.

Currently (2018 traffic data) on the **existing road network**, **Junction 2** is operating with one arm exceeding the design capacity threshold but within theoretical capacity (1). For the design year (2039), three arms of this junction exceed the design threshold but are within theoretical capacity, **with and without** the development. Similarly, currently, one arm of **Junction 3** exceeds the design threshold. In 2039, one arm exceeds design capacity threshold and one exceeds theoretical capacity. This occurs **with or without** the development. For the existing road network, all other junctions **(Junctions 1, 4, 5 & 6)** operate within capacity for the existing (2018), opening (2024) and design years (2039).

When the proposed residential development is fully operational and if/when nearby infrastructural projects are complete, there would be 6 new junctions; 2 will comprise new accesses for the residential/school development, 3 will account for the new M28 interchange and 1 includes a possible future signalized junction on the R609.

To account for these potential infrastructure projects, it was necessary to obtain detail on the previous assessments carried out. RPS and SYSTRA were the consultants involved in the M28 and R609 signalised junction respectively. Traffic data was obtained by J.B. Barry and Partners and used when analysing all 12 junctions.

The results of the traffic modelling for the **future road network** indicate that a number of junctions will operate with arms above the design capacity threshold. These include Junction 2, 6, 8 and 10. **Junction 1** operates within capacity, however, it includes a warning in the Design Year (2039). This confirms that restrictions may occur due to traffic queuing to leave the junction on an adjacent arm. The Fingerpost roundabout contains pedestrian crossings on a number of arms and the warning relates to traffic stopping on the roundabout, to give priority to crossing pedestrians.

The results for **Junction 2**, with the future road network, are the same as the existing road network, as it is assumed traffic from the school and residential development will not travel via Junction 2 due to the new road layout; this would be a longer, convoluted route for traffic to access either Douglas, or the new M28. As such, the results of the analysis indicate the proposed development will have a neutral impact at this junction when/if the future road layout becomes operational.

Although, the Maryborough Woods (SB) arm of **Junction 6** operates over design capacity, it is evident from the analysis that the threshold is exceeded in the design year (2039) **with or without** the proposed development. The long-term impact can be described as significant, based on the impact assessment used in the main report. It should be noted that whilst the normal design threshold is exceeded, the theoretical capacity of the junction is not exceeded, and this occurs **with or without** the development.

There is only a slight medium and long-term impact on **Junction 8**, with all arms, except one, well within capacity. Arm B (Maryborough/Carrs Hill Link) exceeds the design threshold marginally. On this arm, there is only a slight impact (5%) as a result of the proposed development. It's also important to note that the (Maryborough/Carrs Hill Link) arm of the junction exceeds the design threshold **with or without** the development, but still remains within theoretical capacity.

As with Junction 8, one arm of **Junction 10** exceeds the RFC design threshold marginally in the 2039 Design Year. The proposed development has an imperceptible impact on this junction as a whole and there is a neutral

impact (0%) on the arm of the junction which exceeds the threshold. As such, this arm, (Maryborough Hill (S)) exceeds the design threshold but remains within capacity threshold, **with and without** the development.

The assessment of all future scenarios demonstrates that the traffic generation associated with the proposed development will have a slight to moderate impact on the surrounding junctions. Of the junctions on the existing and future road networks, it's evident that **Junctions 2, 3, 6, 8 and 10** exceed thresholds on some arms of the junction. Although these junction arms exceed the capacity thresholds in the 2039 Design Year, it is important to note that this occurs **with and without** the development at all of these junctions.

5.2 Service Infrastructure / Utilities

Chapter 5B of the EIAR considers the impacts of infrastructure and utilities required to facilitate the development.

5.2.1 Surface Water Drainage

There is no proposal to utilise any stormwater drainage infrastructure to facilitate the disposal of surface water from the proposed development. All discharges of stormwater will be via the Moneygurney Stream and Douglas Stream. Please refer to Section 7 – Water for the assessment of Water including surface water drainage and storm water.

5.2.2 Foul Water Drainage

The closest existing foul water drainage system to the site is located within the adjacent Vicarage development.

Within the area of the development west of the Moneygurney Stream, it is proposed that a 225mm and 150mm diameter sewers will collect discharges from houses and apartments and flow by gravity to the north-western corner of the site. It is proposed to connect the foul drainage system to the existing foul sewer network at two locations - in the Vicarage and in the Templegrove development.

Within that area east of the Moneygurney Stream, foul water will be collected by gravity sewers for discharge to a pumping station. Pumping of foul water from the three apartment blocks will be required due to the levels of the development in relation to the surrounding topography. To facilitate operation and maintenance, the pumping station will be located alongside the paved area to the rear of the apartment blocks.

The pumped foul sewer will connect to the gravity foul sewer system within the development on the western side of the Moneygurney, and this necessitates a crossing of the stream. To facilitate this crossing, the pumped foul sewer will be attached to the pedestrian footbridge which will span over the stream. Installation of this pumped foul sewer will not require works within the stream.

Foul Water from the proposed development proposed development will enter the collection network and ultimately discharge to Carrigrennan WWTP for treatment and disposal.

The potential adverse impact on the local foul drainage network would be confined to the works required to construct connections to existing manholes.

The development will generate additional foul sewage flows to the existing foul sewage network and municipal wastewater treatment facilities, but the volume of these additional flows is minor in the context of the capacity of the existing network and treatment facilities.

Following mitigation measures proposed the residual impacts on foul water infrastructure during operation are long term and imperceptible for the existing Wastewater Treatment Plant, and long term and slight for the existing foul sewer network.

5.2.3 Potable Water

The following existing watermains have been identified within the proposed Castletreasure site:

- 1 No. 1,200mm diameter trunk watermain;
- 1 No. 300mm diameter distribution watermain; and
- 1 No. 150mm diameter watermain.

The 1200mm diameter trunk main runs along the eastern side of the site over which there is a 30m wayleave which prevents development along this corridor. It is not proposed to connect to, or interfere with, this strategically-important trunk main.

The 300mm diameter watermain running east to west through the middle section of the site over which there is a 10m wide wayleave. It will be necessary to re-locate this main to suit the proposed arrangement of roads and houses on the site. The route for this re-aligned main will generally be along new road corridors with connection to the existing main at the eastern and western boundaries of the site.

Within the site, a 150mm diameter watermain connects to the 300mm diameter distribution watermain and supplies a number of properties to the north of the nearby Vicarage development.

The existing Vicarage development is served by a 150mm diameter watermain which is connected to the 300mm main referred to above. This 150mm diameter main will be re-connected to the re-routed 300mm diameter watermain.

There is a risk of a temporary short-term disruption to the quality of local public water supply during the construction and in particular during diversion of the existing 300mm diameter and 150mm diameter distribution watermains within the site. The likely adverse impact of this will be slight short term when new connections are made to existing pipework, and when temporary shut-downs are required to facilitate such connections.

The diversion of the existing 300mm watermain will be carried out in full consultation with Irish Water and connections to the existing watermain at each end of this diversion, and the permanent connection to serve the development, will be carried out under an agreed methodology and with full notification to existing Irish Water customers who will be affected by the short-term interruptions to water supply which will occur while making these connections.

As a consequence of having to divert the existing 300mm watermain through the site and having to make connections to this existing water main there will be short-term impacts on existing water-supply in the area but these will be managed in full consultation with Irish Water with appropriate notifications and mitigation measures employed. It is proposed that the residual impact on Potable Water Infrastructure during the Construction Phase of the development following mitigation will be short term and slight.

5.2.4 Power

Within the site there are 2 No. sets of 3-Phase overhead ESB power lines routed through the site – one located in the western part of the site and the other located in the eastern part of the site.

Power supply, and the requirement for any alterations to the existing power supply network for the development of the subject site, will be agreed with ESB Networks in advance of construction. All power supply related works will be carried out in accordance with ESB Networks relevant guidelines.

The installation of the utilities for the development will be conducted in parallel with the other services and will primarily involve construction of ducting and chambers using open excavation.

It will be necessary to divert both sets of existing 3-Phase overhead ESB power lines to facilitate the proposed development (including construction of the access bridge). Relocation or diversions to existing overhead ESB

lines may lead to temporary loss of connectivity to and / or interruption of supply from the electrical grid to the surrounding areas. Proposed underground relocation or diversions routes are subject to ESB agreement. This likely adverse impact may be characterised as a temporary, regionally short term, minimal impact.

No significant impacts from either the Construction or Operational Phase of the development are likely, as a consequence of the connection to the Power network.

5.2.5 Gas

There are no gas mains routed through the site, but there is a 125mm diameter, 4-bar medium pressure gas main located in the Vicarage to the north of the site. This gas main extends beyond the Vicarage boundary and terminates at a point within the site of the proposed development.

Gas supply, and the requirement for any alterations to the existing gas supply network for the development of the subject site, will be agreed in advance of construction with Gas Networks Ireland. All gas supply related works will be carried out in accordance with Gas Networks Ireland relevant guidelines. To the north of the site, there is an existing 125mm diameter, 4 bar medium pressure pipe that could be extended to supply the development. This will need to be co-ordinated and confirmed by Gas Networks.

There may be a potential temporary loss of connection to the Gas Networks Ireland infrastructure while carrying out works to provide connection to the proposed development. This likely adverse impact may be characterised as a temporary, regionally short term, moderate impact.

No significant impacts from either the Construction or Operational Phase of the development are likely, as a consequence of the connection to the Gas network.

5.2.6 Telecommunications

The area surrounding the proposed development is serviced by High Speed Broadband, with EIR Fibre available in the Vicarage immediately adjacent to the site.

Telecommunications supply, and the requirement for any alterations to the existing telecommunications network for the proposed development, will be agreed in advance of construction with the relevant telecommunications providers. All telecommunications related works will be carried out in accordance with relevant guidelines.

There may be a potential temporary loss of connection to the telecommunications infrastructure while carrying out works to provide connection to the proposed development.

No significant impacts from either the Construction or Operational Phase of the development are likely, as a consequence of the connection to the Telecommunications network.

6.0 LAND AND SOILS

6.1 Introduction

Chapter 6 of the EIAR provides an assessment of the Land and Soil impacts for the proposed residential development.

The proposed site is currently green field, undulating and contains two hydrological features, the Douglas and Moneygurney Streams, which flow in a northerly direction through the site. The Moneygurney Stream flows in a north westerly direction through the site and forms a portion of the northern boundary of the site. The proposed site slopes steeply towards the Moneygurney Stream (approx. 38m OD) to the north east and towards the Douglas Stream to the west (approx. 38m OD) from a high point of approx. 82mOD at the southern boundary of the proposed development. Phase 4 of the development is located on the steeply sloping overgrown lands located between the R609 Carr's Hill (approx. 62mOD) and the Moneygurney Stream (approx. 45mOD)

The land was previously used for agriculture but has not been put to agricultural use for a number of years. The land also contains water supply infrastructure comprising a 300mm and a 1200mm diameter water mains. The lands to the west and north are the established residential areas of Donnybrook and Carr's Hill. Localised areas of land to the western and northern sides of the site were previously infilled with excavated soil most likely from developments adjacent to the site which have since naturally re-vegetated.

6.2 Existing Environment

6.2.1 Subsoil / Bedrock

Information on the subsoil geology of the study area has been obtained from the Geological Survey of Ireland (GSI) website.

The Geological Survey of Ireland (GSI) and Environmental Protection Agency (EPA) regional mapping data indicates that the soils in the area comprise of till derived chiefly from Devonian Sandstones; Made Ground; and Rock - bedrock outcrop and subcrop.

Teagasc/EPA Mapping identifies the Soil Association as being Clonroche Soils which are described as "fine loamy drift with siliceous stones" and are very widely distributed in the Cork and Munster area.

Information on the solid geology of this area has been obtained from maps and field guides published by the GSI. The Geology of South Cork Sheet 25 covers the site and indicates the site is underlain by Ballytrasna Formation described as Purple Mudstone and Sandstone.

GSI mapping indicates that the site is underlain by purple mudstone and sandstone, the overall GSI aquifer classification for this formation is Ll, a locally important aquifer overlying bedrock which is Moderately productive only in Local Zones. GSI Mapping also indicates the site is underlain by the overall Ballinhassig East groundwater body which is designated as a poorly productive bedrock.

A review of the GSI's County Geological Sites of County Cork (Geological Survey of Ireland, 2016), indicated there are no County Geological Sites (CGS) identified within the perimeter of the site or within the study area.

The Geological Survey of Ireland Quarry Database provides a comprehensive database of active quarries and pits in the Republic of Ireland. No active quarries or Mineral Locations were identified at the location of the proposed development. Materials required from quarries will only be sourced from quarries which are listed on the register maintained by the local authority and which are compliant with relevant legislation.

6.2.2 Ground Investigation

A ground investigation was carried out to establish subsurface conditions at the proposed project by Priority Geotechnical Limited in 2018. A summary of the ground investigation carried out is provided with a summary of encountered ground conditions detailed below.

Topsoil

Topsoil: Comprising brown slightly sandy to sandy SILT (Sand is fine to coarse) was encountered between 0.1 - 0.6m bgl.

Made Ground

Made Ground has been defined as soil which has been altered in some way by human activity (imported and placed in-situ) was encountered in 5 No. locations and described as dark brown, slightly sandy to sandy, gravelly SILT/CLAY FILL with cobble and boulder fill (with rootlets, rubbish and timber).

The Made Ground is local to a number of soil heaps and earthen berms identified in the lands to the east of the Irish Water pumping station and south of the existing Templegrove apartments where soil and stone from the construction of the adjacent existing apartment developments was stockpiled. Detailed soil laboratory contamination testing was undertaken with all samples from this site fall into the INERT classification, no evidence of contamination was found.

Cohesive Glacial Till

Cohesive glacial till was generally encountered directly beneath topsoil, interbedded with granular glacial till and/or above rockhead. It is generally described as firm/stiff slightly sandy gravelly SILT with low cobble content. Purple slightly sandy to sandy slightly gravelly to gravelly CLAY with cobbles was also encountered.

Granular Glacial Till

The granular glacial till is generally described as purple/brown, (slightly) silty, (very) sandy GRAVEL and very silty, very gravelly SAND. Sand is described as fine to coarse, gravel is described as fine to coarse, angular to sub-rounded of mixed lithologies.

Encountered Bedrock Geology

Weak to medium weak purple / brown Mudstone bedrock was encountered in all rotary boreholes at depths ranging from 1.5 to 8.95m bgl. Weathered Bedrock was also encountered in 11 of the 18 Trial Pits excavated and generally recovered as purple brown clayey sandy GRAVEL encountered at depths ranging from 0.6 to 4m bgl.

Groundwater

Groundwater was encountered in the cable percussion boreholes, rotary coreholes and trial pits at depths ranging from 0.8 to 9.0m below ground level.

Groundwater vulnerability provides an indication of the ease at which potential contaminants can migrate downwards from the surface to the underlying aquifer. Vulnerability is identified in the mapping as predominantly being "Extreme" with "X" (rock near the surface or karst) located at the western and northern extents of the proposed site indicating a shallow depth to bedrock across the proposed site.

The bedrock forms a Locally Important Aquifer which is moderately productive only in local zones (Ll). Folding and faulting within the bedrock results in zones of enhanced permeability in the mudstones and sandstones.

Groundwater Source Protection Schemes are county-based projects that are undertaken jointly between the GSI and the respective Local Authority. There are no Groundwater Source Protection Schemes for water supplies within the study area, or within 10km of the site.

6.3 Predicted Impacts

Predicted impacts during the construction phase of development include:

1) Removal of the soil cover and, as necessary, the excavation of the underlying subsoils in order to facilitate the construction of building foundations and retaining structures which will facilitate housing/apartment/roads construction,
2) Removal of weathered bedrock and, as necessary, the excavation of the underlying subsoils in order to facilitate the construction of building foundations and retaining structures which will facilitate housing/apartment/roads construction,
3) Potential for the loss of the aggregate resource.
4) Potential for erosion due to the exposure of Earthworks surfaces during the excavation of cuttings and general construction works.
5) Potential for the sealing / compaction of subsoil (following topsoil removal) by vehicles and plant tracking over areas of topsoil and overburden.
6) Potential for localised accidental spillages of fuel or chemicals on the site have the potential to contaminate the underlying soils by exposure, dewatering or construction related spillages resulting in an Impact on Soils.
7) Potential for ground vibrations, unwanted compaction and disturbance of natural ground of unfinished road surfaces. During earthworks construction, heavily loaded large earthmoving vehicles will travel through the site.
8) Potential for unplanned activities which may impact the groundwater quality on site during the construction phase are:
    - Accidental spillages of polluting materials on site (The amount of fuel on site during the construction will be limited to fuel storage for plant),
    - Release of fines into the groundwater, and
    - The potential for contaminated runoff to enter the groundwater.
9) Potential for the reduction in Recharge Area due the introduction of impermeable surfaces (roofs, roads and carparks).

6.4 Mitigation Measures

Best practice guidelines with regard to environmental management and pollution control for the construction industry (e.g. CIRIA guidelines), will be implemented for the proposed development through the Construction Management Plan (CMP).

This will be maintained by the contractor during the construction phase. An outline CMP is included in the EIAR. The CMP will include a range of site specific measures which will include the following mitigation measures:

- Stripping of topsoil will be carried out in a controlled and carefully managed way and coordinated with the proposed staging for the development.
- At any given time, the extent of topsoil strip (and consequent exposure of subsoil) will be limited to the immediate vicinity of active work areas.
- Topsoil stockpiles will be protected for the duration of the works and not located in areas where sediment laden runoff may enter watercourses.
- Topsoil will be re-used where possible in gardens and park areas.
- Earthworks plant and vehicles delivering construction materials to site will be confined to predetermined haul routes around the site. This will help reduce the surface area of disturbed ground which will limit the potential for soil compaction, sediment runoff or dust generation.
- Refueling and servicing of construction machinery will take place in a designated hardstanding area, remote from surface water inlets (when it is not possible to carry out such activities off-site).
- In order to prevent the accidental release of hazardous materials (fuels, paints, cleaning agents, etc.) during construction site activity, all hazardous materials will be stored within secondary containment designed to retain at least 110% of the storage contents. Temporary bunds for oil/diesel storage tanks will be used on the site during the construction phase of the project. Safe materials handling of all potentially hazardous materials will be emphasised to all construction personnel employed during this phase of the project.
- Designated stockpile areas for the temporary storage of topsoil, subsoils and rock material required for site use will be established in areas where the ground flattest and well away (>20m) from surface water features and steep slopes.
- Phase 1 temporary storage of material acceptable for re-use surplus to on site requirements will be stockpiled until the completion of the Moneygurney Bridge is operational. The stockpile will be limited to a maximum height of 2.5m above existing ground levels. Stockpiles to be retained for a period greater than six months will be sown with a grass (a non-perennial ryegrass mix or sterile ryegrass) which will reduce the potential for weed germination. Topsoil stockpiles will be clearly signposted for easy identification and to avoid any inadvertent losses. Stockpiles will have sediment control measures installed.
- A contaminated soils management plan will be in place in case unexpected materials are encountered during the exaction of subsoils (in particular existing areas of made ground TP011, BH7 and BH 8 (south of the Templegrove Apartments) and TP 14 and BH10 (east of the Irish Water Pump Station). This will include the detailed site assessment, soil segregation, storage, testing and if necessary, removal from site, of any suspect or contaminated material.

6.5 Impact Assessment

The site's soils are considered to have a Medium Importance as the attribute, which are moderately drained fertile soils, would have a medium quality significance or value on a local scale. The Impact Magnitude is considered to be Small Adverse on a local level as there is a permanent and irreversible loss of a large area of fertile soils, however these soil types are very common and extensive in the Cork area and therefore would have a Negligible Impact on a more regional scale.

The removal of bedrock during excavation works is a direct and permanent impact on the Soils and Geology of the proposed development. The bedrock attribute is of moderate importance. The magnitude of this potential impact is negligible (NRA 2008) and would be classified under the EPA guidelines as having a neutral effect, of imperceptible significance and permanent duration.

Locally Important Bedrock Aquifer: Locally important aquifer overlying bedrock which is Moderately productive only in Local Zones. Attribute has a medium quality or value on a local scale. neutral quality, imperceptible significance. The magnitude of this potential impact on the Locally Important Aquifer could potentially be Moderate Adverse resulting in a significance rating of Moderate.

Economic Geology: Sub-economic extractable mineral resource. Attribute has a medium quality or value on a local scale. The type of bedrock that will be excavated is widely available and deemed an uneconomically extractable mineral resource. The magnitude of this potential impact is a negative effect, of imperceptible significance and of permanent duration.

6.6 Conclusion

An overall analysis of the impacts in light of the proposed mitigation measures concludes that all of the potential Land & Soils Impacts (both construction and operational impacts) are predicted to be reduced to neutral quality, imperceptible significance.

7.0 WATER

7.1 Introduction

Chapter 7 of the EIAR provides an assessment of the potential impact of the proposed development on Water (watercourse and groundwater).

Background information on the nature of the Water elements (surface freshwater bodies), their characteristics and status were obtained from a wide variety of available documents and online references. Consultation was undertaken with the relevant authorities.

7.2 Existing Receiving Environment

The Environmental Protection Agency (EPA) regional mapping identifies two hydrological features on the site, the Moneygurney and Douglas Streams.

The Moneygurney stream rises approximately 1.5km south east of the proposed development in Moneygurney. The stream flows in a northernly direction generally parallel with the existing N28 where the catchment is generally arable land. It then flows in a north westerly direction away from the existing Carr's Hill Interchange and through a river valley located within the east / north east sector of the proposed site before flowing through urbanised areas of Templegrove and Berkley.

The Douglas stream forms the western boundary of the proposed site and rises approximately 350m south of the proposed site. This stream flows in a northerly direction and joins the Moneygurney stream at the north-western corner of the proposed development.

Approximately 400m downstream the Moneygurney Stream joins the Grange Stream to form the Ballybrack Stream which then flows in a northerly direction through Ballybrack Woods, Ravensdale and Douglas Community Park. It is then culverted under Douglas Shopping Centre and joins the tidally influenced Tramore River to the north of Douglas. The Ballybrack Stream is formed by the confluence of the Grange and Moneygurney Streams.

The catchment of the Moneygurney stream is included in the Tramore River (Costal) (IE_SW_19_1964) *Water Matters Report*, available at www.wfdireland.ie . As per the Tramore River downstream, the upstream watercourses in the immediate vicinity of the proposed site are classified as a "*moderate*" overall ecological status with watercourses classified as "*at risk of not achieving good status*".

There are no EPA water quality monitoring stations located on the Moneygurney or Ballybrack Streams and therefore no biological ratings (Q Values) are available for the watercourses immediately adjacent to the proposed scheme.

7.2.1 Surface Water

The extent, density and character of the proposed developments within the application site including the density, location of open spaces etc. will affect run-off rates, water quality in adjacent watercourses, groundwater recharge ability and impact existing smaller surface water channels. To facilitate development, it will be necessary to service the proposed development with physical infrastructure which will have the characteristics described below.

Within that area of the development west of the Moneygurney Stream, surface water runoff from roads/ footpaths/houses and other impermeable areas will be collected by a network of surface water sewers and will discharge to proposed stormwater attenuation areas in the north-east and north-west corners of the site. Attenuated runoff from these areas will be directed for discharge to the Moneygurney Stream (on the east) and the Douglas Stream (on the west).

Within that area of the development east of the Moneygurney Stream, surface water runoff from impermeable paved and roof areas will be collected by a network of surface water sewers and will discharge to a proposed stormwater attenuation area within that location. Attenuated runoff from this area will be directed for discharge to the Moneygurney Stream.

- The surface water strategy for the development will incorporate SuDS (Sustainable Drainage Systems) features to reduce run-off and provide biodiversity benefits. Parking surfaces will comprise permeable paving overlying a porous aggregate reservoir, which has been sized to ensure the runoff from these parking areas drains via the porous aggregate and not directly over the surface to the sealed surface water sewer pipework, thereby providing an additional element of source attenuation.
- Other SuDS measures such as filter drains behind retaining structures will be incorporated into the surface water drainage system.
- Notwithstanding the SuDS source measures proposed; the development will include the construction of a gravity surface water drainage network throughout the site. The surface water drainage network will include installation of dedicated attenuation facilities upstream of proposed outfalls to the Moneygurney and Douglas Streams, to attenuate discharges to the undeveloped 'greenfield' runoff rates with the operation of proprietary hydrobrake flow-control devices.
- These attenuation facilities are sized on the basis of a design storm with a 100-year return period and an additional 20% allowance for the effect of climate change. The attenuation facilities will be in the form of linear chambers similar to that supplied by StormTech or Triton. While not factored into the design volume assessment, these systems will permit an element of infiltration where underlying ground conditions are suitable.

The attenuation areas will be fitted with hydrobrake flow control devices to ensure that excess surface runoff from the developed site will be attenuated and discharged at the greenfield discharge rate.

A hydrocarbon interceptor will be installed upstream of each of the attenuation areas to remove any traces of oils which may be washed off road surfaces. Also, grit sumps will be incorporated into the manholes immediately upstream of the attenuation areas to ensure that the bulk of the grit suspended in runoff is settled out before entering the attenuation areas.

The surface water outfall structures will comprise stone-filled gabion block headwalls and wingwalls and a stone-filled apron, with headwalls set-back from the existing stream banks and constructed to prevent scouring and erosion.

7.3 Potential Impacts

Predicted impacts during the construction phase of development include:

- Potential for surface water runoff from the construction phase may also contain increased silt levels or result in pollution from the construction processes. The discharge of these contaminants, such as concrete and cement, which are alkaline and corrosive, to the Moneygurney and Douglas Streams has the potential to cause pollution.
- Accidental oil or fuel spillages or leaks from construction activities also have the potential to find their way into the adjacent water courses. Increased silt and contaminant levels lead to the risk of reducing water quality in the adjoining water courses.
- There will be limited interaction during the construction stage mainly comprising temporary access over the Moneygurney Stream. The construction of the scheme may generate debris, including silt, which if handled incorrectly could result in blockage of the existing surface water channels downstream reducing the capacity of these channels and increasing the risk of flooding.

Predicted impacts during the operation phase of development include:

- Accidental hydrocarbon leaks and subsequent discharge into piped surface water drainage network (e.g. along roads and in driveway areas).
- Contamination risks arising from development use / leaking pipes / contaminated surface water runoff.
- Increased impermeable surface area will reduce local groundwater recharge.
- Surface water run-off discharge rates from the development sites may be increased due to the increase in the area of impermeable surfaces, shorter flow paths through pipes and reduced roughness co-efficient, however the implementation of SuDS features will maintain runoff rates at, or below, existing greenfield runoff rates.

7.4 Mitigation Measures – Construction & Operation

7.4.1 Construction Phase

To minimise the impact of the construction phase on the water environment, mitigation measures will be implemented as part of a site-specific Construction Management Plan. Best practice guidelines with regard to environmental management and pollution control for the construction industry (e.g. CIRIA guidelines), will be implemented for the proposed development through the Construction Management Plan. Best site management practice for the control of silt and solids discharge into the watercourse.

7.4.2 Operational Phase

Operational phase mitigation measures are detailed below:

- Surface water runoff from the site will be attenuated to the greenfield runoff rate as recommended in the Greater Dublin Strategic Drainage Study (GDSDS). Surface water discharge rates will be controlled by Hydrobrake flow control devices, with underground attenuation tanks, provided to store runoff from a 1 in 100-year return period event. SuDS features, such as the use of permeable paving are implemented in the surface water drainage network to reduce the rate of runoff form hard standing area and to improve the quality of surface water runoff.

- Surface water runoff from the development will be collected by an appropriately designed system with contaminants removed prior to discharge i.e. petrol interceptor.
- A regular maintenance and inspection programme of the flow control devices, attenuation storage facilities, gullies and petrol interceptor will be required during the Operational Phase to ensure the proper working of the development's networks and discharges.
- A regular maintenance and inspection programme for the bridge structures (main and pedestrian bridges) will be required during the Operational Phase to ensure the proper working of the development's infrastructure.

7.5 Impact Determination for the Proposed Scheme:

An overall analysis of the impacts considering the proposed mitigation measures concludes that all of the potential impacts (both construction and operational impacts) are predicted to be reduced to a neutral quality, imperceptible significance.

Therefore, the significance of the impact of the proposed Castletreasure development, considering both construction and operational activities, is imperceptible and is considered not to change in combination with the other projects.

8.0 BIODIVERSITY

8.1 Introduction

The biodiversity study and impact assessment of the proposed new residential development at Castletreasure/ Maryborough townlands Douglas was undertaken by Kelleher Ecology Services Ltd. A series of baseline field surveys were completed at the EIAR study site including; habitat & botanical, aquatic ecology, bird, mammal, bat and other taxa. The baseline field surveys along with desktop review were then used to inform the biodiversity evaluation of the EIAR study site, assessment of potential impacts arising from the proposed development and consideration of appropriate mitigation measures to reduce potential negative impact(s) to an acceptable level where possible.

8.2 Existing Environment

8.2.1 Designated Nature Conservation Sites

The study site is not located within or adjacent to any designated nature conservation area, where several occur within 15km of the study site including Cork Harbour SPA, Douglas River Estuary pNHA and Monkstown Creek pNHA. The study site drains into Douglas and Moneygurney Streams, which combine to flow into Douglas estuary/Lough Mahon transitional waterbody where Cork Harbour SPA and Douglas River Estuary pNHA also occur *c.* 2km downstream of the closest proposed stormwater discharge points at site. While all pNHAs are of national importance, all SAC/SPAs are of international importance.

A Natura Impact Statement (NIS) in support of the Appropriate Assessment process has been undertaken to consider whether significant effects on potentially relevant Natura 2000 sites are likely to arise in relation to the proposed development here with key findings summarised in this EIAR.

8.2.2 Habitats & Flora

No Annex I habitats listed under the EU Habitats Directive or botanical species protected under the Flora (Protection) Order 2015, listed in the EU Habitats Directive or red-listed in Ireland were recorded at the study site. The main habitats that will be directly impacted by the proposed development include habitats of lower local importance (neutral grassland, dense bracken, wet grassland, amenity grassland, recolonising bare ground and spoil and bareground) or of no ecological value (buildings and artificial surfaces). Semi-natural habitat of higher local importance that will be directly impacted by the proposed development includes hedgerows,

treelines and scrub. Two semi-natural eroding streams of lower local importance (Douglas Stream) and county importance (Moneygurney Stream) are also present. Wet Pedunculate Oak-Ash woodland associated with the Douglas and Moneygurney riparian corridors are also of county importance.

8.2.3 Aquatic Ecology in the Existing Environment

The Douglas Stream is considered a semi-natural watercourse with local channel modifications but retaining a good semi-natural profile as the broad-leaved woodlands bordering the stream and more limited encroachment from urbanisation have helped preserve it overtime. The stream is of limited value for salmonids and if present likely persist at low densities. The stream also achieved Q3-4 moderate status water quality and thus was not achieving target good quality water as required under the water Framework Directive. It may be considered of lower local importance by virtue of its fisheries, water quality and overall aquatic ecological value.

The Moneygurney Stream is considered a semi-natural watercourse with local channel modifications but retains a good semi-natural profile with riffle, glide and pool sequences that supports brown trout in its upper reaches (after RPS 2017), with confirmed visual presence downstream of the confluence with the Douglas Stream in the Ballybrack Stream also. The presence of habitat supporting wild brown trout and potentially European eels would indicate that both streams are of county importance particularly in light of good quality water (Q4) and the presence of an urban brown trout population. Rivers with Q4 water are also achieving target good status under the Water Framework Directive and are rare in urban or peri-urban areas such as Castletreaure.

8.2.4 Birds

A total of 27 bird species were noted at the study site and historically in the wider area. While none of the bird species in question are listed on Annex I of the EU Birds Directive, two are red-listed species of high conservation concern in Ireland; Grey Wagtail *Motacilla cinerea* and Yellowhammer *Emberiza citronella*. Most bird species are protected under the Irish Wildlife Acts (1976 - 2018), where it is an offence to hunt, interfere with or destroy their breeding or resting places (unless under statutory licence/permission). The study site supports suitable foraging, commuting, nesting and perching habitats for bird species in general and is considered to be of lower to higher local importance for birds overall.

8.2.5 Mammals (non-volant)

Several mammal species have been noted at the study site and historically in the wider area; Fox *Vulpes Vulpes*, Rabbit *Oryctolagus cuniculus*, Bank Vole *Myodes glareolus*, American Mink *Mustela vison*, Badger *Meles meles*, Hedgehog *Erinaceus europaeus*, Stoat *Mustela erminea hibernica*, Otter *Lutra lutra*, Pygmy Shrew *Sorex minutus* and Red Squirrel *Sciurus vulgaris*.

These mammal species are relatively widespread and common nationally, apart from the introduced Bank Vole that has a more south-western distribution nationally. Most are also of least/no conservation concern, other than Red Squirrel and Otter that are currently considered to be Near Threatened. Apart from Fox and Rabbit, Bank Vole and American Mink - all of the other mammal species mentioned are legally protected by the Irish Wildlife Acts (1976 – 2018), where it is an offence to hunt or interfere with or destroy their breeding or resting places (unless under statutory licence / permission). Otter is also listed on Annex II and Annex IV of the EU Habitats Directive as a species requiring SAC designation and in need of strict protection.

The study site currently provides commuting (*i.e.* wildlife corridors), resting, breeding and feeding opportunities for a number of non-volant mammals, largely through the presence of woody habitat (scrub, hedgerow, treeline, woodland), and is therefore considered to be of lower to higher local value for mammals overall.

8.2.6 Bats

A total of four bat species were confirmed using the study site; Common Pipistrelle *Pipistrellus pipistrellus*, Soprano Pipistrelle *Pipistrellus pygmaeus*, Leisler's Bat *Nyctalus leisleri*, and Natterer's Bat *Myotis*. The passive and active detector study did not indicate the presence of a bat maternity roost at the study site. There are no permanent roosting opportunities for bats at the study site due to the lack of structures, although it is possible that some mature trees may provide transient roosting opportunities for bats during the summer period.

All of the bat species noted at the study site are considered to be relatively widespread and common nationally and are largely considered to be of least concern in terms of conservation status apart from Leisler's Bat as it is scare in the rest of Europe although common in Ireland. All bat species occurring in Ireland are legally protected under the Irish Wildlife Acts (1976 - 2018), where it is an offence to hunt or interfere with or destroy their breeding or resting places (unless under statutory licence / permission). Furthermore, all bat species are listed on Annex IV of the EU Habitats Directive as species requiring strict protection.

The study site currently provides commuting and feeding opportunities for bats through the presence of linear woody habitats, where non-woody open grassland habitat of the study site is of less ecological value for bats in general. The passive and active detector study did not indicate the presence of a bat maternity roost at the study site. While there are no structures present at site that could provide permanent roosting opportunities for bats, some of the mature trees present (including those being retained) may potentially provide transient roosting opportunities for bats during the summer period. The study site is therefore considered to be of lower to higher local value for bats overall.

8.2.7 Other Taxa

A number of other taxa have been noted at the study site and historically at the wider area, including the threatened bee species (*Andrena nigroaenea* and *Nomada goodeniana*) and near threatened Red-tailed Bumblebee *Bombus lapidarius*. The high impact invasive ladybird, Harlequin Ladybird *Harmonia axyridis* has also been historically recorded at/near the study site in recent years; Harlequin Ladybird is listed on the Third Schedule of the 2011 European Communities (Birds and Natural Habitats) Regulations, as a species of which it is a legal offense to introduce or disperse.

The study site currently provides commuting and feeding opportunities for bats through the presence of linear woody habitats, where non-woody open grassland habitat of the study site is of less ecological value for bats in general. The passive and active detector study did not indicate the presence of a bat maternity roost at the study site. While there are no structures present at site that could provide permanent roosting opportunities for bats, some of the mature trees present (including those being retained) may potentially provide transient roosting opportunities for bats during the summer period. The study site is therefore considered to be of lower to higher local value for bats overall.

8.3 Potential Impacts

The proposed development area is primarily of lower to higher local importance for biodiversity, with Moneygurney Stream and wet woodland associated with both watercourses of county importance.

Potential impacts on existing biodiversity of the site and wider area arising from the proposed residential development at Castletreasure/Maryborough townlands requires consideration. Such impacts can arise during the construction and/or operational phases of the proposed development and are considered for each biodiversity aspect examined, as well as the do-nothing and cumulative scenarios.

8.4 Conclusion: Residual Impacts

The proposed development area is primarily of lower to higher local importance for biodiversity, with Moneygurney Stream and wet woodland associated with both watercourses of county importance. The landscape masterplan associated with the development proposes to retain and enhance existing hedgerows/ treelines and plant new native hedgerows and woodland resulting in a net gain of such habitats (including wildlife corridors), along with a gain in new wildflower meadows, native grass/clover areas as well as parkland and flower/shrub habitats using native/non-native pollinator friendly planting. However, there will be a net loss of existing wet woodland and while this will be offset to some degree by new native woodland planting, it will not entirely be compensated. Existing wet woodland may also be negatively cumulatively impacted through direct loss with two other developments, although the extent will be substantially less and relatively minor in comparison to the residential site under consideration here.

Potential construction stage effects arising from the general loss/damage of some habitats and reduction of associated opportunities for biodiversity are generally considered slight negative to neutral, with the exception of wet woodland associated with both watercourses that will incur a significant negative effect through direct loss. Construction stage effects relating to the failure of bird nests due to the removal of woody vegetation during the bird nesting season are possibly significant/very significant negative temporary. Potential operational stage effects are considered slight positive for habitats/flora as new landscaping matures, again with the exception of wet woodland associated with both watercourses that will remain a significant negative effect through direct loss. Potential operational stage effects on fauna (including bats) are considered neutral and not significant as new planting/landscaping matures and neutral imperceptible where the lighting scheme ensures that artificial light spillage is kept to a minimum.

Residual impacts on the aquatic ecology of the Douglas Stream are considered short-term imperceptible. However, given the presence of salmonids in both the Moneygurney and Ballybrack Streams, and also good water quality in the both, impacts may be considered higher than imperceptible. Therefore, residual impacts on the aquatic ecology of the Moneygurney & Ballybrack Streams are considered short-term and slight when also taking into account cumulative impacts.

There is a potential link between the study site and three aquatic based designated nature conservation sites via surface-water in the wider area that are of national and international importance in relation to biodiversity evaluation. Potential impacts arising from the development site on such designated aquatic habitats in the wider area and associated biodiversity are considered neutral with the implementation of construction and operational phase soils and water management proposals, even if these proposals are not primarily designed to address any particular risks to the designated nature conservation sites as such.

9.0 NOISE & VIBRATION

Chapter 9 of the EIAR provides an assessment of the likely noise and vibration impact associated with the proposed the residential development at Castletreasure, Carr's Hill, Co. Cork.

The existing noise climate has been surveyed over the course of the daytime periods and has been found to be typical of a suburban location influenced by road traffic along the surrounding roads in the vicinity, birdsong, aircraft movements and noise from nearby residential areas.

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

During the construction phase of the project vibration impact of the works on nearby residential buildings is not expected to pose any significance in terms of potential for cosmetic or structural damage. Noise levels will be increased during different phases of the works occurring at the development site. It is expected that construction works will generate high levels of noise and there is potential for significant short-term adverse impact on nearby sensitive receivers, particularly within 30m of certain construction works during the construction period. As works move beyond this range around the site noise levels will reduce during the construction phase. Mitigation measures have been proposed to minimise significant noise or vibration impact on sensitive receivers.

The impact of the change in traffic volumes along surrounding roads as a result of the development has been assessed. The increase in noise associated with additional traffic is negligible.

Once operational, the proposed creche building will run mechanical plant items. No vibration impacts are predicted to occur from this source. In respect of noise, mechanical plant items will be designed and located such that any noise emissions will be within the relevant noise criteria within the development, therefore at off site locations further away, no significant adverse impact is predicted.

10.0 AIR & CLIMATE

Chapter 10 of the EIAR provides an assessment of the likely impact on air quality and climate associated with the proposed the residential development at Castletreasure, Carr's Hill, Douglas, Co. Cork.

In terms of the existing air quality environment, baseline data and data available from similar environments indicates that levels of nitrogen dioxide, carbon monoxide, particulate matter less than 10 microns and less than 2.5 microns and benzene are generally well below the National and European Union (EU) ambient air quality standards.

The greatest potential impact on air quality during the construction phase is predicted to be from construction dust emissions and the potential for nuisance dust. In order to minimise dust emissions during construction, a series of mitigation measures were prepared in the form of a Dust Minimisation Plan. When the dust minimisation set out in the plan are implemented, fugitive emissions of dust from the site will be insignificant and pose no nuisance at nearby receptors.

The operational impact of the development was assessed based on emissions of the pollutants nitrogen dioxide, particulate matter less than 10 microns, particulate matter less than 2.5 microns, carbon monoxide and benzene using the UK Design Manual for Roads and Bridges screening model which is a recommended screening model for assessing the impact of traffic on air quality. The inputs to the air dispersion model consist of information on road layouts, receptor locations, annual average daily traffic movement's, annual average traffic speeds and background concentrations. The climatic impact based on greenhouse gas (GHG) emissions of CO_2 was also assessed using the Design Manual for Roads and Bridges screening model.

The impact of the traffic from the proposed development compared to the respective EU limit values for the pollutants was assessed. Based on the modelling results, the impact of the development in terms of ambient levels of, nitrogen dioxide, particulate matter less than 10 microns, particulate matter less than 2.5 microns, carbon monoxide and benzene are predicted to be imperceptible with respect to the operational phase air quality. The operational stage impact on climate is also considered to be imperceptible.

As the National and EU standards for air quality are based on the protection of human health, and concentrations of pollutants for both the construction and operational stages of the proposed development are predicted to be significantly below these standards, the impact to human health is predicted to be imperceptible and not significant in the short and long term.

11.0 CULTURAL HERITAGE

11.1 Introduction

Chapter 11 assesses the impacts of the proposed development on the known and potential cultural heritage resource. The term 'Cultural Heritage' encompasses heritage assets relevant to both the tangible resource (archaeology, architecture heritage); and non-tangible resources (history, folklore, tradition, language, placenames etc.). The recorded and potential cultural heritage resource within lands encompassing both the proposed development site (hereafter referred to as the 'study area') and the lands extending for 500m from its boundary, was assessed in order to compile a comprehensive cultural heritage baseline and context.

11.2 Methodology

Guiding principles in relation to the assessment of impacts of Cultural Heritage, including current legislation, and EPA Guidelines were adhered to as part of the methodological approach, with a view to identifying likely and significant impacts on the resource.

Documentary research on the recorded and potential cultural heritage resource within the study area and its environs was carried out in order to identify any recorded archaeological, architectural and other cultural heritage sites and features. This information has provided an insight into the development of the study area over time and also assisted in an evaluation of the potential presence of unrecorded cultural heritage sites or features.

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 Culture, Heritage and the Gaeltacht (DoCHG). Cork County Council's Record of Protected Structures (RPS) and the DoCHG's National Inventory of Architectural Heritage (NIAH) were consulted to assess the designated architectural heritage resource. Summaries of the legal and planning frameworks designed to protect these elements of the cultural heritage resource are also provided within the chapter. Various relevant literary sources, datasets and cartographic sources were also reviewed as part of the assessment.

The study area was inspected on a number of occasions during 2018. The lands were assessed in terms of modern land use, remnants of historic landscape features, vegetation cover and the potential for the presence of previously unrecorded archaeological and architectural heritage sites/features. The survey results are described within the chapter and extracts from the photographic record compiled during the field survey are presented in Appendix 11.1.

11.3 Description of Existing Environment

The site is located at Carr's Hill, Douglas and comprises an area of vacant farmland extending into Castletreasure and Maryborough townlands which contains a mixture of grassland and areas under gorse, scrub and woodland cover. The ground surface within areas of the western end of the site has been disturbed by what appears to have been ancillary activity carried out during the construction of nearby modern residential developments.

There are no recorded archaeological sites located within the proposed development site. The Archaeological Survey of Ireland lists four recorded archaeological sites within 500m of its boundary and the nearest example is a ringfort (CO086-014----) which is located within a green area in a housing estate located 320m to the north.

There are no designated architectural heritage structures (Protected Structures or buildings listed in the NIAH) located within the proposed development site or within 500m of its boundary. There are no extant structures of any date located within the site boundary and the built environment within its surrounds is modern in character.

No potential unrecorded archaeological sites were identified within the site boundary during the desktop study and field surveys undertaken as part of the assessment, it is noted the potential exists for the presence of sub-surface archaeological sites, features and artefacts within the study area. A narrow stream extending through the north end of the study area forms the townland boundary between Castletreasure and Moneygurney townlands and is deemed to be of local cultural heritage significance and of archaeological potential. A stream forming the western boundary of the study area is also deemed to be of archaeological potential.

11.4 Impact Assessment

11.4.1 Archaeology

There are no recorded archaeological sites within the study area, or within 320m of its boundary, and the proposed development will, therefore, have an imperceptible impact on the recorded archaeological resource during the construction and operational phases.

While no evidence for unrecorded archaeological sites or features was identified during the assessment the potential exists for the presence of unrecorded, sub-surface archaeological features in undisturbed green field areas and in the sections of two streams extending within its boundary. There are no proposed interventions to the stream extending along the western boundary of the study area. The majority of the section of the northern stream will be maintained within undeveloped areas although it will be crossed at two points: by an access road bridge and a pedestrian footbridge.

As the existence, nature and extent of any unrecorded archaeological features within the study area are unknown; the level of potential impacts is indeterminable. However, ground works required for housing construction will have the likely potential to result in negative, direct, significant, permanent impacts on any sub-surface or in-channel archaeological features that may exist within the study area boundary.

11.4.2 Architectural Heritage

There are no designated architectural heritage sites located within the study area or within 500m of its boundary and the surrounding built environment is modern in character. The proposed development will, therefore, have an imperceptible impact on the architectural heritage resource during the construction and operational phases.

11.4.3 Undesignated Cultural Heritage Assests

There is one feature of local cultural heritage significance located within the study area and this comprises the northern stream which forms the townland boundary between Castletreasure and Moneygurney. The proposed construction of an access road bridge and a pedestrian bridge over this feature will have a negative, direct, not significant, permanent impact on this feature.

11.5 Mitigation

11.5.1 Archaeology

Given the scale and extent of the proposed development within an undeveloped green field area, a programme of archaeological investigations, to comprise a geophysical survey followed by targeted archaeological test trenching, will be undertaken prior to the commencement of the construction phase. A wading survey and metal-detecting survey of the sections of the northern stream to be crossed by an access road bridge and a pedestrian bridge will be undertaken in conjunction with the test trench excavations. These archaeological site investigations will be carried out under licences issued by the National Monuments Service.

11.5.2 Architectural Heritage

There are no Protected Structures or NIAH listed structures, or extant structures of any date, located within the study area. There are also no designated architectural heritage structures located within 500m of its boundary and the surrounding built environment is modern in date. It is, therefore, concluded that no mitigation measures, or monitoring measures thereof, for the architectural heritage resource are required.

11.5.3 Undesignated Cultural Heritage Assets

A small stream extending through the northern end of the study area forms the townland boundary between Castletreasure and Moneygurney. The two sections of this watercourse to be impacted by the proposed access road bridge and pedestrian bridge will be investigated as part of the archaeological mitigation measures outlined above.

11.6 Residual Impacts

All potential impacts will be addressed by mitigation during the pre-construction phase of the proposed development which will provide for the recording and/or avoidance of any potential sub-surface archaeological features that may exist within the site. There are no designated structures of architectural heritage significance located within the study area or its environs. As a result, no residual impacts on the cultural heritage resource are predicted

12.0 POPULATION & HUMAN HEALTH

Chapter 12 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. Detailed consideration was given to the surrounding area and the potential receptors and receiving environment that might be affected by the proposed development. These have been identified as the surrounding residents/homes and the community facilities and services in the area, local schools and childcare facilities, local amenities such as community groups, clubs and societies, and temporary receptors such as drivers passing the site (although these impacts are generally considered to relate to visual impact, covered in Chapter 4 Landscape and Visual). 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.

12.1 Do Nothing Scenario

While there would be no immediate impact on the existing population or economic activity in Douglas if the development was not constructed, it could lead to a significant negative long-term impact on both the South Environs and the wider metropolitan area as the identified population targets would not be achievable, thereby undermining the Core Strategy of the Cork County Development Plan. No additional employment opportunities would arise meaning a neutral impact on economic activity. Similarly, there would be a neutral impact on the land use given that the site would remain under agricultural use.

12.2 Human Health

Many of the potential impacts on human health are addressed within the relevant discipline chapters of the EIAR. Human health risks not addressed elsewhere in the EIAR relate to Construction Health & Safety; and availability of Recreation and Amenity Facilities.

It is considered that the greatest health and safety risks will be posed during the construction phase of the proposed development. 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 include the management of the site in accordance with the Safety, Health and Welfare at Work (Construction) Regulations, 2013; the review of safety practices at both design stage and during construction; the implementation of corrective actions wherever necessary; and the restriction of access to the site area and construction compound. Monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission.

There will be no potential significant negative impacts in terms of health and safety during the operation of the proposed development. In terms of recreation and amenity, the proposed layout provides for excellent public amenity and recreational facilities, including approximately 4.4 hectares of parkland (i.e. the Dughghlaise Valley parkland which runs east to west through the site), a network of c. 1.5km of fitness trails, walking routes and cycleways that meander through the site, other smaller park areas and parklets, as well as a number of play opportunities for children of all ages. The provision of these amenity facilities within the proposed Castletreasure 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.

12.3 Population and Economic Activity

It is unlikely that the potential impacts arising during the construction phase will be of a scale to either encourage people to move from the area or discourage people from moving to the area. Therefore, the impact on population will be imperceptible. The proposed development will support the ongoing employment of approximately 80-100 construction workers on site with many others employed indirectly through spin-off jobs off site. The development will therefore have a moderate positive short-term impact on the local construction industry.

The change of land use of the site from agricultural to residential is also anticipated to have a neutral impact given that the land is not actively farmed at present and will not result in a loss of agriculturally based employment. In terms of operation, the employment opportunities arising will be limited given the fact that residential is the most prominent land use proposed. Notwithstanding this, there will be additional employment from the proposed creche, albeit small in scale, resulting in a permanent moderate positive impact on economic activity in the town.

The development will also lead to the generation of additional demand for pre-school places in the town, notwithstanding that some children will be cared for at home, by childminders, or in creche facilities close to their parent's place of employment. However, given that a creche with capacity for up to 75 children is provided as part of the proposed development, it is envisaged that there will be a neutral to slight positive long-term impact on the demand for pre-school places. Similarly, there will be a demand for places at both national and secondary school level. However, it will take several years before the development is built out and demand for school places will peak. Existing schools in the Douglas area and the surrounding area will provide capacity for new students generated in the short term and therefore, the need for short term mitigation measures is not anticipated. In the medium to long term, the construction of a primary school within the EIAR study area (providing 624 pupil spaces), as well as the completion of the proposed secondary school at Ardarrig (providing 600 pupil spaces) would cater for additional growth in student numbers as the population of the completed development grows and matures, while also offering increased choice for both future and existing populations. While both schools are currently being decided by both Cork County Council (ref. 18/6246) and An Bord Pleanala (ref. 18/5369 / ABP ref. 302942-18), both applications demonstrate that it is the intention of the Department of Education to provide these schools in the short to medium term. However, should these schools not be provided in a timely manner, as demand for school places increases in the town, this would have a moderate medium to long term negative impact.

12.4 Local Amenity

A stock-proof fence will be erected along the perimeter boundary during construction, with the purpose of restricting access to the site. This will likely block views of the area and alter the passive amenity available to adjacent properties and passers-by. However, as a sizable proportion of the proposed site is screened by existing trees and hedgerows, particularly along the western boundary, this impact will be slight negative short term in nature.

During operation, the change of the land use from 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 4 Landscape and Visual. The provision of recreation and amenity facilities on site, which include approximately 4.4 hectares of parkland, a network of c. 1.5km of fitness trails, walking routes and cycleways that meander through the site, other smaller park areas and parklets, as well as a number of play areas, will exceed the local policy requirement. Therefore, it is considered that there will be a significant positive permanent impact on their local amenity. The extension of the Ballybrack Greenway through the site will also result in a significant positive permanent impact on local amenity, especially for those who currently use the network of existing greenway routes in the surrounding area.

13.0 SIGNIFICANT INTERACTIONS

The construction, operational and cumulative impacts of the proposed development have been assessed within each chapter of the EIAR. This chapter considers the significant interactions of impacts between each of the separate disciplines.

In practice many impacts have slight or subtle interactions with other disciplines. Discussions of the nature and effect of the impact is primarily undertaken within each of the relevant chapters. Chapter 13 highlights those interactions which are considered to potentially be of a significant nature.

Table 13.1 provides a matrix summarising potential significant interactions

Interaction	Landscape		Material Assets – Traffic & Transport		Material Assets – Infrastructure		Land & Soils		Water		Biodiversity		Noise & Vibration		Air Quality & Climate		Cultural Heritage		Population & Human Health	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Landscape			✓	×	×	×	✓	×	×	×	×	×	×	×	×	×	×	×	×	×
Material Assets: Traffic & Transport							×	×	×	×	×	×	✓	×	✓	×	×	×	×	×
Material Assets: Infrastructure									✓	✓	×	×	×	×	×	×	×	×	✓	✓
Land & Soils									✓	×	✓	×	×	×	✓	×	×	×	✓	×
Water											✓	✓	×	×	×	×	×	×	✓	✓
Biodiversity													×	×	×	×	×	×	×	×
Noise & Vibration															×	×	×	×	×	×
Air Quality & Climate																	×	×	×	×
Cultural Heritage																			×	×
Population & Human Health																				

Con. = Construction Phase

Op. = Operational Phase

Each discipline was considered in relation to its potential significant interaction with other disciplines during the construction and operational phase of the development. Having considered the mitigation measures in place, no residual risk of significant negative interaction between any disciplines was identified. Accordingly, no further mitigation measures were required.

14.0 SUMMARY OF MITIGATION MEASURES

Chapter 14 of the Environmental Impact Assessment provides a summary of the mitigation measures proposed for each discipline. A Construction Management Plan (CMP) will be agreed with the Planning Authority, prior to the commencement of construction activities on the site, and will incorporate provision for the primary construction mitigation measures.