Volume 1

EIAR Non-Technical Summary

FOR

STRATEGIC HOUSING DEVELOPMENT

AT

KILMONEY ROAD, CARRIGALINE, CO. CORK

May 2022

ON BEHALF OF

Reside Investments Limited

Prepared by
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1 INTRODUCTION

This Environmental Impact Assessment Report (EIAR) has been commissioned by the Applicant, Reside Investments Limited, in respect of a Proposed Development at a site located at Kilmoney Road, Carrigaline, Co. Cork for a Strategic Housing Development.

An Environmental Impact Assessment Report (EIAR) is an assessment and analysis of potential impacts on the receiving environment that may arise as a result of the Proposed Development. An EIAR is required to accompany a planning application for development of a class set out in Schedule 5, Part 1 of the Planning and Development Regulations which exceeds a limit, quantity or threshold set for that class of development.

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

> *10. Infrastructure projects*
>
> *(iv) Urban development which would involve an area greater than 2 hectares in the case of a business district, 10 hectares in the case of other parts of a built-up area and 20 hectares elsewhere.*
>
> *(In this paragraph, "business district" means a district within a city or town in which the predominant land use is retail or commercial use.)*

The total Site area comprises 3.7 hectares. There is a net developable area of 1.9 hectares which is just under the threshold of 2 hectares for a business district. It was on this basis that the Applicant prepared an EIAR.

In assessing the environmental impacts, this EIAR will evaluate the existing situation and assess any potential impacts of the Proposed Development. Where potential impacts are identified, mitigation measures will be proposed. In addition, the in-combination effects of any other known plans or projects will be identified and assessed.

This Non-Technical Summary (NTS) describes the Proposed Development, the Environmental Impact Assessment (EIA) process and summarises the key environmental impacts arising from each of the environmental assessments carried out by a panel of experts in accordance with best practice. The environmental assessments involved desktop studies, site visits, surveys, and site-specific investigations. The NTS also outlines the mitigation and monitoring measures proposed along with a list of any residual impacts that may occur from the Proposed Development.

2 OVERVIEW OF THE PROPOSED DEVELOPMENT

Permission is sought for the following Proposed Development:

- The construction of 224 no. residential units consisting of 202 no. proposed apartments in 2 no. blocks, ranging in height from 6 to 7 storeys and 22 no. 3 storey townhouse/duplex units

- A 184 m^2 creche/childcare facility
- The provision of landscaping and amenity areas to include 1 no. local play area, 1 no. kick about area, an activity trail/greenway along the river, a gathering area/amphitheatre with tired seating areas, a civic space/promenade and 2 no. courtyard areas
- The provision of 3 no. retail units, residential amenity and management spaces at ground and first floor level, and
- All associated ancillary development including vehicular access on to the Kilmoney Road Lower, and a cycle/pedestrian connection on to the R611 (via an activity trail/greenway along the river), lighting, drainage, roads boundary treatments, ESB Substation, bicycle & car parking and bin storage.

A range of unit types and sizes are provided comprising 95 no. 1 bed (42%), 95 no. 2 bed (42%) and 12 no. 3 bed units (5%) to be provided in a mix of 202 apartment units (90%), and 22 no. townhouse/duplex units (10%). The Proposed Development will provide much needed housing within Metropolitan Cork and Carrigaline, where there is currently a chronic shortage of housing. The Proposed Development will function as a natural extension to the town centre of Carrigaline by consolidating development in the area and ensuring the retention of a compact settlement.

The Proposed Development is clearly distinguishable and takes due cognisance of the amenities of existing dwellings to the west of the Site. The Proposed Development proposes a range of building heights from 3 to 7 no. storeys to respond to the various contextual conditions surrounding the Site with the tallest elements located in the north of the Site.

In terms of public open space provision, the open space areas (including both passive and active open space) comprise of 20,511m^2 or 67% of the net Site area. A further 2,359m^2 communal space will be provided for the use of residents of the scheme. The public open space will consist of 1 no. local play area, 2 no. kick about areas, an activity trail/greenway along the river, a gathering area/amphitheatre with tiered seating areas, a civic space/promenade and 2 no. courtyard areas. The proposed Site layout also ensures that the existing and new neighbourhoods are lined with enhanced physical and visual connections for cyclists and pedestrians. The Proposed Development respects the character of the surrounding area, delivering a network of open spaces which will serve as a valuable amenity for future residents of the Site.

The Proposed Development also retains natural features where possible and incorporates significant landscaping especially in the amenity area on the northern part of the Site and along the boundaries of the Site, which will maximise screening of the development. The existing mature trees along the boundaries of the Site, which offer both a natural noise ventilation for the Proposed Development and an aesthetic element, will be retained where possible and incorporated into the Proposed Development. The overall Proposed Development provides a mix of style, size and type of unit, to provide a selection of units in varying configurations. The proposed design reflects and builds upon the materials, form and landscape already established in the area and will provide a pleasant environment for families to live. The various apartment types add to the variety of housing available in the area, ensuring the provision of homes that will meet the needs of the future residents of the town of Carrigaline.

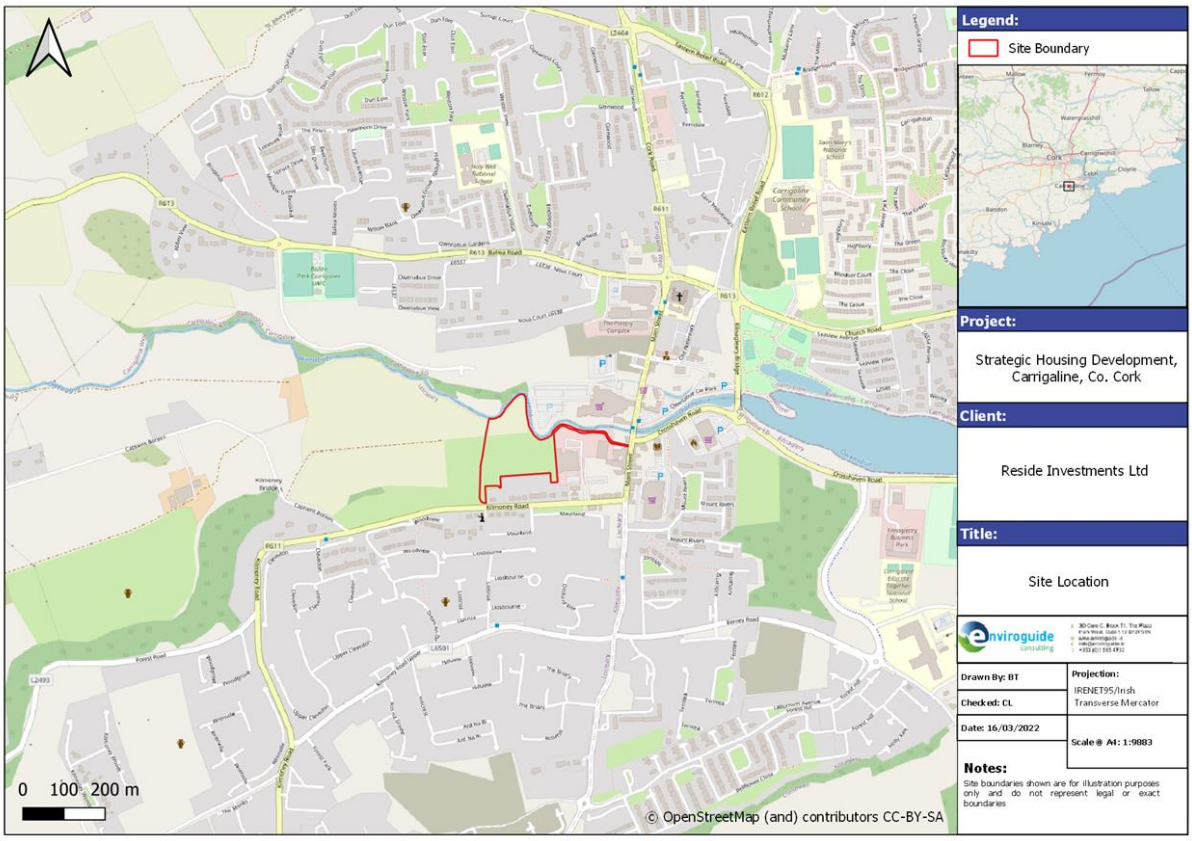

Figure 2-1: Site Location Map

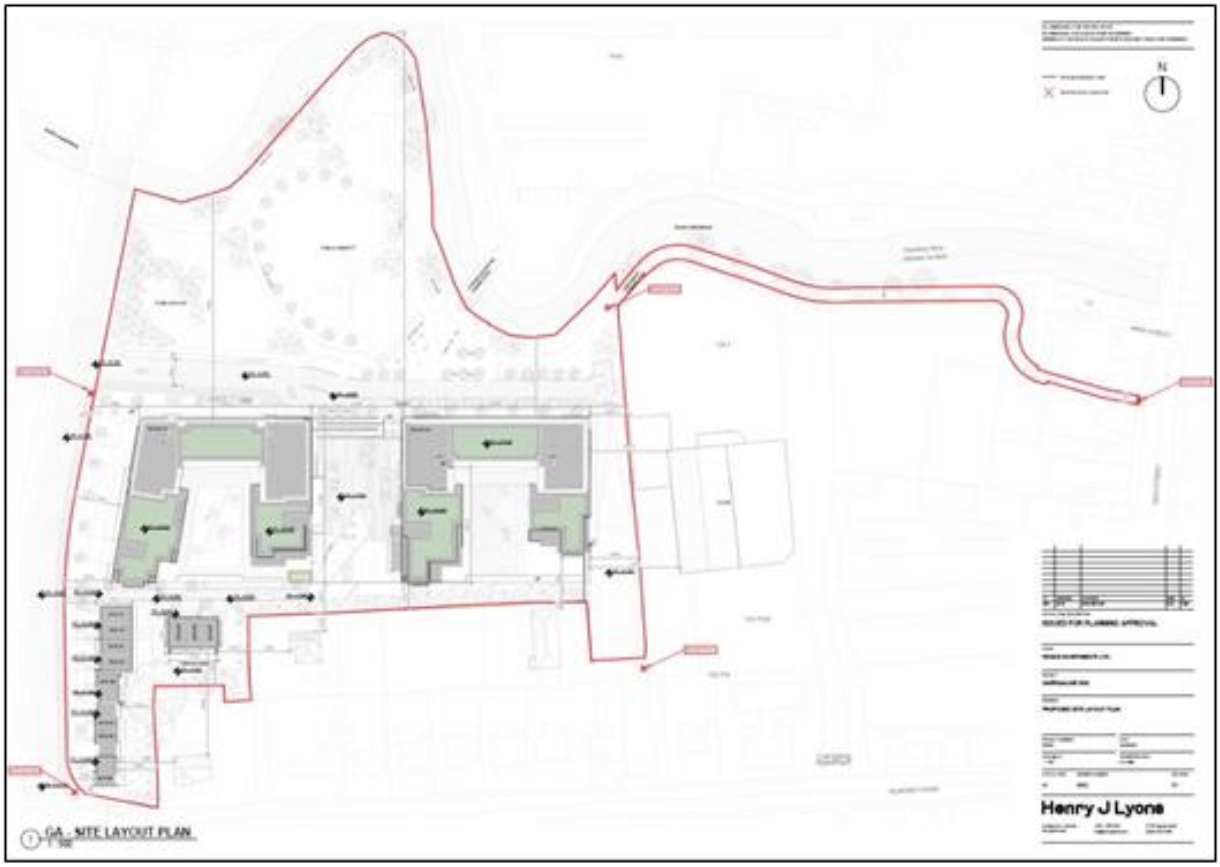

Figure 2-2: Site Layout Plan

2.1 Operational Phase

The Proposed Development will comprise residential and commercial use consistent with the land use zoning for the area. The Operational Phase of the Proposed Development will consist of the normal day-to-day operations necessary for the management of a residential/retail development, and the ongoing maintenance of the residential dwellings, retail units, community facilities and public outdoor areas.

2.2 Construction Phase

All construction works will occur in a single phase which is estimated to last 18 months. For the duration of the proposed infrastructure works it is envisaged that the maximum working hours will be 07:00 to 18:00 Monday to Friday (excluding bank holidays) and 08:00 to 13:00 Saturdays, subject to the restrictions imposed by the local authorities. No working will be allowed on Sundays and Public Holidays unless express permission is obtained from the Local Authority.

The construction entrance to the Site of the Proposed Development will be from the Carrigaline Inner Western Relief Road (IWRR) (due to be complete in May 2022) to the west of the Site and will include a vehicular access for construction traffic and a pedestrian access for construction personnel. Deliveries to the Site by Large Goods Vehicles not exceeding 10m in length will be restricted to the period 10.00 to 16.00. During the general excavation of the foundations there will be additional (heavy goods vehicle (HGV) movements to and from the Site. All suitable excavated material will be used for construction and fill activities where possible and appropriate.

No public personnel, be it pedestrian or vehicular, will be permitted to enter the Site. Appropriate signage shall be positioned at approach roads to the Site area so as to inform the public of the site activities.

It is envisaged that tower cranes will be erected to hoist materials on Site in the construction of apartments. Several measures to prevent or reduce noise, dust, litter and other environmental nuisances associated with the construction phase are outlined in the Construction and Environmental Management Plan (CEMP) (Enviroguide Consulting, 2022).

3 SITE DESCRIPTION

The Proposed Development is located in the townland of Kilmoney within the town of Carrigaline which is identified as a ‘Metropolitan Town’ in the Cork County Development Plan 2015-2021, and the Bandon-Kinsale Municipal District Local Area Plan 2017. The Site of the Proposed Development is situated to the west of the Carrigaline Town Centre and approximately 10km southeast of Cork City Centre. The Site lies to the south of the N28 Cork-to-Ringaskiddy route. The total Site area comprises 3.7 hectares and has a sloped topography. There is a net developable area of 1.9 hectares.

The Site of the Proposed Development is situated towards the southwest of the designated Carrigaline Town Centre zone. The Site is bounded to the north by Owenabue River and mature trees and hedgerows, to the east by the Dairygold Co-op Superstore and associated car park, to the south by a number of detached bungalows with the Kilmoney Road beyond, and to the west by the Carrigaline Inner Western Relief Road (IWRR) (due to be complete in May 2022) and agricultural fields.

The Site is within easy walking distance of a number of commercial and community facilities including local shops, churches and schools. Access to the Site is via the Carrigaline IWRR and the Kilmoney Road which runs to the south of the Site.

The Carrigaline IWRR has unlocked the development potential of the lands lying to the West of the main street in Carrigaline, which have remained largely underdeveloped while the town has expanded north toward Cork City and to the East towards the harbour. The IWRR defines the western edge of the town centre. Further to the west lies the flood plain for the Owenabue River and lands zoned for Open Space / Amenity (Building Height Rationale, Henry J Lyons, 2022).

4 ENVIRONMENTAL IMPACTS

The potential Environmental Impacts of the Proposed Development during all phases of the Proposed Development are addressed in the EIAR under the following headings as prescribed under the EIA Directive:

- Population and Human Health
- Biodiversity
- Land and Soils
- Hydrology and Hydrogeology
- Air Quality and Climate
- Noise and Vibration
- Landscape and Visual Amenity
- Archaeology and Cultural Heritage
- Material Assets: Traffic, Waste and Utilities

Additionally, risk management and interactions between environmental factors have been examined, and a programme of mitigation and monitoring measures has been set out.

4.1 Population and Human Health

4.1.1 Introduction

The assessment of Population and Human Health assesses the potential impacts of the Proposed Development on population and human health.

Carrigaline is a town in County Cork located along the River Owenabue and is situated approximately 13 km from Cork City Centre. Due to its location within the Cork Metropolitan Area, Carrigaline acts as a gateway to both Cork City as well as West Cork. The Cork County Development Plan (CDP) 2014 and the Cork County Draft Development Plan 2022 identifies Carrigaline as one of the nine Metropolitan Towns within Cork. Under objective CS 3-1 in the Cork Draft County Development Plan, this designation defines Metropolitan Towns as areas that ‘strengthen and consolidate the retail role and function of the smaller metropolitan towns and to provide retail development in accordance with their planned population growth to serve their local catchments’. Further, this is reinstated in the Draft Development Plan as this designation signifies the importance of ensuring accessibility through national and international connectivity, strong business cores, as well as a role in innovation, education, retail, health, and culture. For this assessment, statistical analysis and assessment will

encompass the 3 no. of Electoral Divisions (ED) that are within Carrigaline. These include Carrigaline North ED, Carrigaline South ED, and Liscleary ED.

Figure 4-1: Carrigaline Electoral Division (Proposed Development Site identified at red star)

4.1.2 Population

The Regional Spatial Economic Strategy (RSES) for the Southern Region which came into effect in January 2020 identifies that the Southern Region is the second most population Regional Assembly area and that all 10 local authority areas within the region have experienced growth at varying levels since 2006. Population projections anticipate large increases in the 15 – 24 year (+26%), 45 – 44 year age groups are projected to decrease by approximately 14%.

The Cork County Development Plan 2014 sets a population target of 620,622 for Cork City and County to be achieved by 2022, representing an increase of c.15%. However, it is recognised that this will be revised to consider changes to the county boundary. Carrigaline is anticipated to experience a significant increase in its population from a figure of 15,770 to 20,501 by 2028. According to these figures provided in the Cork County Development Plan 2014 and the associated Census, calculations reveal that in order to cater to such rapid growth, an additional 1,944 residential units in total will be required to meet this population projection.

There are 18.5% of young adults (age 19-34) and in the North ED and 19% of this age group in the South ED. In total, 18.6% of the population in Carrigaline are between the ages of 19-34, which also consistent with the state and county averages. The age group of 35-64 consists of 42.3% of the population in the North ED and 41.5% in the South ED. In regards to the

Liscleary ED, there are 17.2% of the population is within the age of 19 – 34, and 41.6% fall within the ages 35 – 64. When these age groups are totalled with all of three EDs, 60.3% of the Carrigaline population is of this age bracket, which is significantly higher than state and county averages. This is significant, as the Census reveals that both of these age groups are the largest in Carrigaline and therefore play a significant role in development and growth in the town, as these groups consist of renters, homeowners, young families, and mature families.

The aging population consists of residents aged 65 and older. This age group encompasses 8.2% of the population in the North ED and 11.9% in the South ED. The Liscleary ED population records 7.2% of residents within this age group. Overall, 8.4% of the population of Carrigaline (with both North,South, and Liscleary EDs amalgamated) falls under this age group. This average falls below the state, county, and city average.

Table 4-1: Demographic Breakdown of Carrigaline, Census 2016

Area	Age 0-4	Age 5-11	Age 12-18	Age 19-34	Age 35-64	Age 65+	Total Population
State	331,515	484,368	435,913	990,618	1,881,884	637,567	4,761,865
As percentage of total population	6.9%	10.2%	9.2%	20.8%	39.5%	13.4%	n/a
Cork County	31,337	46,583	39,969	74,664	170,524	54,116	417,211
As percentage of total population	7.5%	12.2%	9.6%	17.9%	40.9%	12.9%	n/a
Cork City	6305	8,270	8,661	37,932	44,762	19,727	125,657
As percentage of total population	5%	6.6%	6.9%	30.2%	35.6%	15.7%	n/a
Carrigaline North	954	1,495	1,301	2,241	5,133	994	12,118
As percentage of total population	7.8%	12.3%	10.7%	18.5%	42.3%	8.2%	n/a
Carrigaline South	253	231	189	472	1,022	295	2,462
As percentage of total population	10%	9.3%	7.6%	19%	41.5%	11.9%	n/a
Liscleary ED	370	598	606	799	1,932	336	4,641
As percentage of total population	7.9%	12.8%	13%	17.2%	41.6%	7.2%	n/a

4.1.3 Impact Assessment

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

- Residential Areas in proximity;

- Community facilities and services including schools and creches;
- Local amenity;
- Economic activities

4.1.4 Do Nothing Scenario

If the development were not to proceed there would be no immediate impact on the existing population, or economic activity for residents living in that area. However, due to the size of the Site in relation to other areas of land zoned for residential/town centre, the increased housing targets presented in the Cork County Development Plan 2014 and its Draft Plan 2022, as well as the Bandon Kinsale LAP. This would have a negative impact on the Carrigaline Municipal District as a whole as well as its role as a Metropolitan Town, which subsequently undermines the Core Strategy and supportive objects in the Development Plans.

As previously stated, the Bandon Kinsale LAP has the Site zoned under CL-U-02 (Town Centre/Neighbourhood Centre). Due to the nature of the development providing a mixed-use scheme with amenity areas suitable for town centre environments, the consideration of alternative sites is not necessary. The consideration of an alternative location would equate to a 'do-nothing' alternative for the Proposed Development Site and the Site would become overgrown and unkept. This would mean that these lands would not be developed in accordance with the objectives of the Local Area Plan.

Both the Cork Development Plan 2014, its Draft Plan 2022, as well as the LAP note the importance of prioritising town centre growth in Carrigaline in order to enhance its role as a Metropolitan Town. Improving these qualities will create opportunity and employment, increase the range of services in order to effectively serve the needs of the community while attracting town centre growth in Carrigaline. These objectives will be difficult to maintain without a residential development element to such schemes. In the absence of the relevant policies and specific objectives of the Site there would be no framework directing developments to appropriate locations and this would have the potential to result in adverse impacts on the environmental components, which could negatively affect human health.

The land would likely remain agricultural use. Therefore, the impacts on land use are therefore envisaged to be neutral for the 'do – nothing' scenario.

4.1.5 Construction Phase Impacts

Generally, the potential impacts arising during the construction phase relate to quality of life including visual impact / amenity, noise, air quality and transport. Where relevant, these impacts have been considered in the relevant chapters of the EIAR and will be minimised or mitigated where appropriate.

No significant negative residual impacts have been identified once mitigation measures are put in practice. No significant impacts on economic activity or local amenity are anticipated as a result of the Proposed Development. The existing road network has been demonstrated to have sufficient capacity to accommodate construction traffic associated with the Proposed Development.

An Outline Construction Management Plan and Outline Demolition and Construction Waste Management Plan have been prepared which set out the general measures which will be taken to ensure the Site is secured and to ensure the health and safety of workers, on-site staff and those likely to be affected by the development including pedestrians, road users, neighbours and visitors to the Site. The measures include;

- Health and safety policies on the Site, including a main contractor's construction stage health and safety plan which will be prepared by the project supervisor for the construction stage;
- Liaison with local residents and businesses to maintain good relationships and minimise disruption;
- Site security and suitable hoarding to separate the Site from surrounding roads and buildings;
- A management plan for siting and using large plant (cranes);
- Site compound and safe storage of materials, excavated materials, fuels, paints, cleaning agents etc.

Following implementation of these measures adverse effects on human health during the construction phase of the project are not likely, and any effects will be neutral and short term.

4.1.6 Operational Phase

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

4.1.7 Cumulative Impacts

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

Table 4-2: Cumulative Impacts – List Permitted and Proposed Developments

No.	Planning Reference No.		Comment
1	21/17180	The demolition of a two-storey existing dwelling. The construction of a three storey, 5 no. unit, apartment building (Block A) consisting of 4 no. 1 bedroom apartments, and 1 no. 3 bedroom apartment and the construction of a four storey, 32 no. unit, apartment building (Block B) consisting of 20 no. 1 bedroom apartment and 12 no. 2 bedroom apartments to the rear of Dunmahon Main Street, Carrigaline with vehicular access off of Kilmoney Road Lower. The creation of a new pedestrian entrance off of Main Street and a vehicular delivery access gateway and a pedestrian escape gateway to the existing adjacent public	Application was received on 14/12/2021 by Cork County Council and is currently undergoing the Further Information stage of the planning process.

No.	Planning Reference No.		Comment
		house from the proposed new carpark area. The proposed development will comprise of a total of 37 no. apartments.	
2	21/4818	A residential development consisting of 72 no. two-storey houses and all ancillary car parking, landscaping and site development works. The proposed site development works include the construction of a pumping station, underground tank, welfare kiosk/building, control kiosk/building and fencing. Access to the proposed development will be via Ballea Roundabout and the existing road permitted by Planning Ref: 06/11262- Extension of duration of permission granted under Planning Reference: 15/6753	Applied for extension of duration that was granted by Cork County Council on 25/05/2021.
3	21/6926	The change of use of an existing disused dry-cleaning shop to a new Pizzeria, including the sale of hot food for consumption off the premises, internal refurbishment works, new signage to the front elevation, and all associated site development works.	Granted permission with 20 conditions on 16/12/2021.
4	21/7464	The construction of a single storey discount food store (ALDI) (1,819sq/m gross floor area, 1,315 sq/m net floor area) including the sale of alcohol for consumption off the premises; loading bay; rooftop solar panels; external plant enclosure; bin store; trolley bay; signage; single storey café unit; single storey DRS unit; substation; plaza areas; sculpture; security barriers; 119 no. car parking spaces (including EV, disabled and parent and child spaces), of which 30 no. spaces will function as a public car park; new junction with the Carrigaline Western Relief Road (under construction) and internal access road; pedestrian and cycle connection to Main Street; and all associated boundary treatment, landscaping, drainage and site development works. A Natura Impact Statement will be submitted to the Planning Authority with the application. On a site at Carrigaline Town Centre, bound by Main Street and the Carrigaline Western Relief Road (under construction), Carrigaline West, Carrigaline, Co. Cork.	Application was received on 19/01/2022 and awaiting a decision from Cork County Council.
5	19/4642	Construction of a wastewater pumping station and foul rising main including emergency storage tank, welfare kiosk, control kiosk, services, lighting, and all ancillary site works. A Natura Impact Statement will be submitted to the Planning Authority with the application. Located on Proposed Development site.	Granted permission with 11 conditions on 22/08/2019.
6	19/4204	Demolition of the annex to the rear of existing retail unit and change of use from disused furniture shop to optician practice and to construct a two-storey extension to the rear and alterations to elevations, all to existing retail unit.	Granted permission with 21 conditions on 18/06/2019.

No.	Planning Reference No.		Comment
7	19/4698	Demolition of two vacant residential properties and construction of a new building for retail use which will be amalgamated into the existing Newsagents and Deli area of the adjoining retail building on the northern side with associated seating area, signage and all associated site works.	Granted permission with 19 conditions on 02/09/2019.

4.1.8 Mitigation & Monitoring

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

The Proposed Development has been designed to the highest building standards in accordance with current best practice guidance and incorporates sustainable development measures such as exhaust heat air pumps, and sustainable urban drainage features.

In relation to the demolition, site enabling works and construction phases, health and safety risks will be managed in accordance with the Safety, Health and Welfare at Work (Construction) Regulations, 2013.

No specific monitoring is proposed. In general, monitoring will be undertaken by the Building Regulations certification process and by the requirements of specific conditions of a planning permission. Monitoring is outlined in the interacting chapters – Air, Noise and Traffic.

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

It is anticipated that the Proposed Development will realise significant positive overall economic and social benefits for the local community and the wider Carrigaline area. Strict adherence to the mitigation measures recommended in this EIAR will ensure that there will be no negative residual impact or effects on Population and Human Health from the construction and operation of the proposed scheme. Indeed, the delivery of much needed housing will realise a likely significant positive effect for the local area, particularly Carrigaline's town centre.

4.2 Biodiversity

An assessment of the likely effects on biodiversity (flora and fauna) arising due to the Proposed Development at Kilmoney Road, Carrigaline, Co. Cork was undertaken by Enviroguide Consulting. The assessment involved several steps and was conducted by suitably qualified ecologists. Firstly, baseline ecological surveys were undertaken to assess the nature conservation importance of the Proposed Site. Secondly, the direct, indirect and cumulative ecological implications or impacts of the Proposed Project during its lifetime were assessed. Finally, where possible, mitigation measures to remove or reduce negative impacts

during the Construction and Operational Phases the of the Proposed Development were proposed.

For this biodiversity Chapter, baseline ecological surveys involved a combination of both desk-based and field studies. A desk study was conducted to assess existing information relating to the Site's natural environment. A range of field surveys were undertaken, including habitat surveys, bird surveys, flightless mammal surveys, bat surveys and invasive species surveys. All surveys were conducted following standard and/or best practice protocols.

The main ecological value of the Site of the Proposed Development is the value of its natural and semi-natural habitats (river and treelines). The Proposed Development will result in the loss of some trees on-site, however there will be no loss of individual treeline habitats. No development will occur within the Owenboy River, and a buffer zone will be maintained during the Construction and Operational Phase. A total of 4 bat species was recorded at the Site. The treelines and river habitat within the Proposed Development Site are used as foraging and commuting habitat for local bat populations. One particular tree on-site was noted as having bat roost potential and will be retained as part of the landscape plan. Several bird species were also recorded flying over the Site with the Owenboy River being of particular importance as a foraging habitat and commuting corridor for several waterbird species (Cormorant, Grey Heron, Curlew, Snipe, Little Egret, and Mallard). Species such as Grey Wagtail are also likely to nest in the treelines and river bank vegetation of the Owenboy River. Evidence of Otter activity was also recorded on the banks of the Owenboy River directly adjacent to the Site, however no holts or couches were observed. The Site may contain suitable habitat for small mammals (hedgehog, pygmy shrew) particularly towards the Site margins. No Badger signs (setts, latrines, snuffle holes) were recorded at the Site. Red Fox are likely to use the Site, but no dens were recorded. Overall, the Proposed Development Site has been evaluated to be of *Local importance (higher value)* having regard for the conservation evaluation scheme (NRA 2009) as "*Sites or features containing common or lower value habitats, including naturalised species that are nevertheless essential in maintaining links and ecological corridors between features of higher ecological value*".

The Proposed Development Site itself is not designated. The closest designated Sites to the Proposed Development include Cork Harbour SPA, the Owenboy River (pNHA) and Lough beg (Cork) (pNHA). These designated Sites are hydrologically connected to the Proposed Development via surface water drainage from the Site to the Owenboy River.

Potential impacts arising from the Construction and/or Operational Phase of the Proposed Development, in the absence of mitigation, can be summarised as follows:

- Water quality impacts to the Owenboy River and associated aquatic species arising from surface water run-off during the Construction and Operational Phase,
- Noise and dust emissions from the Proposed Development Site during the Construction Phase,
- Spread of invasive alien flora during the Construction Phase,
- Semi-natural habitat loss,
- Disturbance and/or mortality of fauna within the Site during the Construction Phase and Operational Phase,

- Disturbance to bats within the Site due to increased lighting and potential loss of foraging and/or commuting habitat during the Construction Phase and Operational Phase,
- Disturbance and/or mortality of birds within the Site, due to increased lighting, human presence and loss of potential nesting habitat during the Construction Phase and Operational Phase.

Potential impacts of the Proposed Development were predicted to range from slight to significant at the local scale only and can be readily addressed with the mitigation measures proposed.

To address impacts on freshwater environments and nearby designated Sites arising from surface water discharges, a range of mitigation measures to protect surface water quality are provided. These surface water mitigation measures will remove the pathway (e.g., no release of wastewater generated on-site into nearby waterbodies or existing drains during the Construction Phase) or treat the source (e.g., removal of silt from surface waters via incorporation of sustainable drainage systems (SuDS) into the project design during the Operational Phase).

To address impacts on the surrounding environment due to dust emissions, a dust management plan will be implemented, which will treat/address the source of the impact (e.g., construction traffic, excavations etc) to ensure no impacts arise as a result of dust emissions.

The loss of trees at the Site is addressed by the additional planting of 252 trees which will result in an overall increase in tree cover. The landscape plan also compensates for the loss of native tree species during the Construction Phase by replacement planting with native tree species. A buffer zone will be maintained during the Construction and Operational Phase in which all riverbank vegetation will be retained and supplemented with additional native trees. This will allow for the continued usage of the Owenboy River and its adjacent treelines as commuting corridor and foraging habitat for birds and bats.

Disturbance and/or mortality of local fauna within the Site (e.g., bats, otter, small mammals and birds) is addressed in the Biodiversity Chapter. The mitigation measures outlined ensure that there will be no significant impact on local fauna at the Site. The mitigation measures address the source of impacts (e.g., night-time light pollution, dust, noise, timing of and approach to vegetation clearance, increased human presence).

The potential spread or import of invasive alien flora during the Construction Phase is addressed in the Biodiversity Chapter. Measures ensure that the source of the impact (i.e., the invasive flora) is removed from or prevented entering the Site so that there is no pathway for transfer of invasive flora to the surrounding environs.

Provided all mitigation measures are implemented in full and remain effective throughout the lifetime of the Development, no significant residual negative impacts on the local ecology or on any designated nature conservation Sites are expected from the Proposed Development.

4.3 Land and Soil

An assessment of the potential impact on the existing land, soils and geological environment was carried out by Enviroguide Consulting for the Proposed Development Site.

The assessment was carried out taking cognisance of appropriate national guidelines and standards for Environmental Impact Assessment using data collected from a detailed desk study, a site walkover survey and review of all relevant drawings and documents pertaining to the Proposed Development. The results of the assessment provided information on the baseline conditions at the Proposed Development Site. A detailed assessment of the potential impacts was undertaken, and appropriate avoidance and mitigation measures were identified to reduce any identified potential impact associated with the Proposed Development.

The Proposed Development will include the construction of 2 no. blocks, of 7 storey height with understorey carpark at ground and first floor level and 11 no. townhouse units, 1 no. local courtyard and amenity space, walking paths, ball areas, outdoor gym equipment area and retail kiosk as well as the provision of retail units, residential amenities and management spaces as well as all associated infrastructure and services including 1 no. vehicular access point, roads, parking, lighting and drainage.

The Proposed Development will involve the raising of the ground level across the Site up to 4 meters above Ordnance Datum (mOD). Limited excavation of up to 2.0mBGL will also be required to achieve the proposed levels for the underground utilities and for the installation of the attenuation tank (Invert level 2.7mOD).

Suitable excavated material (soils and bedrock) will be reused within the Proposed Development Site as engineering fill and for landscaping. The excavation of bedrock will not be required as part of the Construction Phase.

The Proposed Development will also require the importation of aggregates during the Construction Phase of the Proposed Development as construction materials to raise ground levels.

A Construction Management Plan (CMP) has been prepared by HorganLynch Consulting Engineers Ltd. (HorganLynch, 2022). The appointed Contractor will prepare a detailed CEMP, including detailed construction phasing and measures to manage and prevent any potential emissions to ground contractor in accordance with industry best practice standards including CIRIA - C532.

The CMP (HorganLynch, 2022) and CEMP will be implemented for the duration of the Construction Phase, covering construction and waste management activities that will take place during the Construction Phase of the Proposed Development.

The measures will address the main activities of potential impact which include:

- Control and Management of surface runoff;
- Control and management of earthworks;
- Fuel and Chemical handling, transport and storage; and
- Accidental release of contaminants.

Emergency procedures will be developed by the appointed Contractor in advance of works commencing and spillage kits will be available on-site including in vehicles operating on-site.

Construction staff will be familiar with emergency procedures for in the event of accidental fuel spillages. Remedial action will be immediately implemented to address any potential impacts in accordance with industry standards and legislative requirements.

There will be no excavation or infilling of soil or bedrock during the Operation Phase of the Proposed Development.

There will be an unavoidable impact on the existing land use with loss of undeveloped land and soil with a 'negative', 'moderate' and 'permanent'.

There are no other overall residual impacts associated with the Proposed Development to the receiving land soils and geology environment.

4.4 Hydrology

The main receptor with a hydrological connection to the works is the Owenboy River. The Owenboy River flows into the Cork Harbour Special Protection Area (SPA) and is located approximately 0.5km (by land) west of the study area. The Owenboy estuary downstream of the Site is also designated as a proposed Natural Heritage Area (pNHA) with primary interests as a habitat for birds. The River Owenboy is classified under the WFD as being of "Moderate" status (2013-2018), under pressure from manmade sources and of being At Risk of not meeting WFD objectives.

The potential impact of the works on River Owenboy during the Construction Phase is short term and is unlikely to have a negative impact as appropriate controls and best management practices will be in place. Predicted impacts during the Operational Phase are expected to be negligible as runoff from roofs and hardstanding areas will be attenuated to greenfield runoff rates before discharge to the river. Thus, it is concluded that the construction and operational phases of the SHD will not compromise progress towards achieving "Good" Status or cause a deterioration of the overall "Good Ecological Potential" of the River Owenboy.

A Site-specific Flood Risk Assessment was completed as per The Planning System and Flood Risk Management, Guidelines for Planning Authorities (2009). The Site is at risk of flooding from fluvial and tidal sources and is partially located within Flood Zone A and B. A hydraulic model was developed to assess if the risk can be removed from the development footprint by providing a compensatory storage. It was determined that, if this mitigation measure is applied, the proposed SHD will not be at significant risk and the impact elsewhere will be negligible. A Justification Test was completed and demonstrated that the Proposed Development satisfies the test criteria and flood risk can be managed at acceptable level.

4.5 Hydrogeology

The Proposed Development is situated in the river valley of the Owenboy River. The Site is underlain by river sediments (alluvium) containing layers of permeable gravels. These subsoils layers overly the bedrock which is approximately 5 metres below ground level. The bedrock is classified as a locally important aquifer in this area. Groundwater monitoring has shown there is a shallow water-table across the northern portion of the Site, close to the river.

The Proposed Development includes some elements which will be constructed below the water-table and this will require dewatering during construction. The estimated dewatering

rates are relatively small and can be readily managed with typical construction dewatering techniques. There are no adjacent sensitive receptors that are likely to be impacted by the temporary dewatering impact.

Standard construction mitigation measures will ensure there is no likely significant impact on groundwater quality during construction.

During operation there will be a minor impact on groundwater flow in the subsoil as some of the building structures extend below the water-table. This will result in a minor increase in groundwater levels upgradient of the Site but will have no discernible impact in groundwater flow to the River Owenboy. There are no expected impacts on groundwater quality during operation.

There are no discernible cumulative impacts as a result of the Proposed Development and other adjacent developments that have been assessed within the chapter.

Upon application of the mitigation measures the magnitude of any effects in the construction phase are negligible. As a result, the significance of all the effects is imperceptible.

4.6 Air Quality & Climate and Microclimate

This chapter examines the potential for the Proposed Development to impact upon air quality and climate within the vicinity of the Proposed Site. This chapter also describes and assesses the impact of the Proposed Development on local climate and on global climate in a wider context.

The primary sources of dust identified during the Construction Phase of the Proposed Development include soil excavation works, demolition, bulk material transportation, loading and unloading, stockpiling materials, cutting and filling, and vehicular movements (HGVs and on-site machinery).

According to Transport Infrastructure Ireland guidelines (TII, 2011), it is difficult to accurately quantify dust emissions arising from construction activities. Therefore, it is not possible to easily predict changes to dust soiling rates or particulate matter (PM10) concentrations. TII recommend a semi-quantitative approach to determine the likelihood of significant impact in this instance. This should also be combined with an assessment of the proposed mitigation measures. In order to account for a worst-case scenario, the Proposed Development can be considered moderate in scale due to the size of the Site and the duration of construction activities. Therefore, it can be assumed that there is potential for significant dust soiling 50m from the Site. There are a number of high-sensitivity receptors (residential dwellings) located within 50m of the Site boundary; these are situated to the south of the Proposed Development Site. Therefore, in the absence of mitigation, it is considered that there is potential for dust impacts to occur at these locations. Appropriate mitigation measures have been recommended and will be implemented at the Site in order to minimise the risk of dust emissions arising during the Construction Phase, provided such measures are adhered to, it is not considered that significant air quality impacts will occur.

Construction vehicles and machinery during this phase will temporarily and intermittently generate exhaust fumes and consequently potential emissions of volatile organic compounds, nitrogen oxides, sulphur oxides, and particulate matter (dust). Dust emissions associated with

vehicular movements are largely due to the resuspension of particulate materials from ground disturbance. According to the Institute of Air Quality Management (IAQM, 2014), experience from the assessment of exhaust emissions from on-site machinery and Site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed. Air pollutants may increase marginally due to construction-related traffic and machinery from the Proposed Development; however, any such increase is not considered significant and will be well within relevant ambient air quality standards. According to TII (2011), the significance of impacts due to vehicle emissions during the Construction Phase will be dependent on the number of additional vehicle movements, the proportion of HGVs and the proximity of sensitive receptors to Site access routes. If construction traffic would lead to a significant change (> 10%) in Annual Average Daily Traffic (AADT) flows near to sensitive receptors, then concentrations of nitrogen dioxide, PM10 and PM2.5 should be predicted in line with the methodology as outlined within TII guidance. Construction traffic is expected to result in a significant change (> 10%) in AADT flows near to sensitive receptors. Therefore, concentrations of NO2 and PM10 have been predicted in the Opening Year (2023).

The air dispersion modelling concluded that the Proposed Development is likely to result in a long-term increase in traffic on the roads surrounding the Proposed Development Site; however, this increase in traffic has been determined to have an overall insignificant impact in terms of local air quality. Furthermore, the increase in traffic has been determined as marginal with regard to climatic impacts. Therefore, no adverse residual impacts are anticipated from the proposed scheme in the context of air quality and climate.

There is the potential for combustion emissions from onsite machinery and traffic derived pollutants of Carbon Dioxide (CO_2) and Nitrous Oxide (N_2O) to be emitted during the Construction Phase of the development. However, due to the size and duration of the Construction Phase, and the mitigation measures proposed, the effect on national greenhouse gas (GHG) emissions will be insignificant in terms of Ireland's obligations under the Kyoto Protocol and therefore will have no considerable impact on climate. Overall, climatic impacts are considered to be short-term and imperceptible.

All construction phase monitoring will be carried out in line with the Construction Environmental Management Plan (CEMP) for the Site. Due to the negligible impact on air quality and climate from the Operational Phase of the Proposed Development, no specific monitoring is recommended during this stage.

B Fluid Limited carried out the Wind Microclimate Study for the Proposed Development. This assessment concluded that the Proposed Development does not give rise to negative or critical speed profiles at the nearby adjacent roads, or nearby buildings. Furthermore, no critical conditions were found for "Frail persons or cyclists" and for members of the "General Public" in the surroundings of the development. The development is designed to be a high-quality environment for the scope of use intended of each area/building (i.e., comfortable, and pleasant for potential pedestrian). Overall, the assessment of the proposed scenario has shown that no area is unsafe, and no conditions of distress are created by the Proposed Development.

4.7 Noise and Vibration

This assessment will examine the likely impacts of sound pressure levels generated by the Proposed Development located in the townland of Kilmoney within the town of Carrigaline, Co. Cork. Noise calculations will be used to predict and assess the likely impact of facility operations on noise sensitive receptors. The likely noise and vibration impacts associated with the Proposed Development have been evaluated, and changes that are likely to impact the surrounding environs have been considered.

The primary noise impacts associated with this Proposed Development is noise due to:

- Development construction works;
- General facility operations; and
- Vehicular traffic such as trucks entering and existing the Site.

No specific construction noise limits are set by Cork County Council with respect to noise. Cork City Council produced the Noise Action Plan 2018-2023. This Noise Action Plan has been prepared in accordance with EU directive 2002/49/EC commonly referred to as the 'END' Directive and the Environmental Noise Regulations 2006 (S.I. No. 140 of 2006), as revoked by European Communities (Environmental Noise) Regulations 2018. The purpose of the Noise Action Plan (NAP) is to act as a means of managing environmental noise, and to meet the aim of the END Directive of preventing, and reducing where necessary, environmental noise through the adoption of the action plan. The Noise Action Plan 2018-2023 suggests that, in accordance with Environment Protection Agency (EPA) recommendations, the proposed onset levels for assessment of noise mitigation are as follows:

- 70 dB Lden (day evening night average sound level); and
- 57 dB Lnight (night time average sound level)

These levels are consistent and comparable with other Local Authorities who had adopted the EPA recommended onset levels.

The Proposed Development is located in Carrigaline, classified as the largest town in Cork. Given the suburban context, a limit value of 70dB Lden for construction works is considered to be reasonable. This limit value is also in agreement with those set by Transport Infrastructure Ireland (TII) for construction projects.

All construction works will occur in a single phase which is estimated to take 18 months to complete. For the duration of the proposed infrastructure works it is envisaged that the maximum working hours will be 07:00 to 18:00 Monday to Friday (excluding bank holidays) and 08:00 to 13:00 Saturdays, subject to the restrictions imposed by the local authorities. No working will be allowed on Sundays and Public Holidays unless express permission is obtained from the Local Authority.

During the Operational Phase of the Proposed Development, no significant sources of noise or vibration are expected with the development. The primary source of outward noise in the operational context relates to any changes in traffic flows along the local road network and any operational plant noise used to serve the ancillary elements within the Proposed Development.

RSK Ireland Limited (RSK) was instructed by Reside Investments Ltd to conduct a ProPG: Acoustic Design Statement in respect of the Proposed Development.

This Acoustic Design Statement considers the potential impact of the existing and future noise sources on future residents of the Proposed Development. It also assesses the potential Operational Phase noise impact of the Proposed Development to nearby existing receptors.

In summary, the Acoustic Design Statement concludes that "once consideration is given to the range of mitigation measures outlined in this Report, the expected noise impact of the Proposed Development, on existing and future residents, is not significant."

Once the development is completed, the potential noise impacts to the surrounding environment are minimal. The residential aspect of the development is not expected to generate any significant noise sources over and above those which form part of the existing environment at neighbouring residential areas (estate vehicle movements, children playing etc.) and hence no significant impact are expected from this area of the development Site.

The nearest noise sensitive locations are residential properties which are located approximately 6m from the Proposed Development southern Site Boundary.

No traffic routes are predicted to experience increases of more than 25% in total traffic flows as a result of the Proposed Development and therefore no detailed assessment is required as per the DMRB Guidelines. In addition, the Traffic and Transport Assessment (6th October 2021, Martin Hanley Consulting Engineers) submitted as part of the Pre-Application Assessment states that "Given the nature of the development a reduction in car trips would be expected over time as further improvements to public transport are developed."

There is the potential for the adopted criteria to be exceeded by some of the equipment during construction works at the nearest sensitive receptors. However, there will be Proposed groups of native field trees informally arranged in the intervening distance between these residential dwellings and the Site of the Proposed Development, as per the proposed Landscape Masterplan (Cunnane Stratton Reynolds, September 2021). It is important to recognise that the sound intensity from a point source will obey the inverse square law if there are no reflections or reverberation. If there are barriers between the source and the point of measurement, the actual intensity is likely to be less than what the inverse square law predicts. Therefore, when taking account of local terrain, predicted noise levels at the closest residential noise sensitive locations are expected to be lower. In order to sufficiently ameliorate the likely noise, dust, litter and other environmental impacts, a schedule of suggested control measures has been formulated and outlined within the Construction Environmental Management Plan (Enviroguide Consulting, May 2022) for the Construction Phase. During the Operational Phase of the development, noise mitigation measures with respect to the outward impact of the development are not deemed necessary.

4.8 Landscape and Visual

This chapter deals with landscape and visual impact assessment (LVIA) examining potential effects of the Proposed Development on the landscape setting as well as on visual receptors in the landscape such as residents, visitors, people pursuing recreational activities etc. The assessment is based on established methodology for such assessments.

This assessment finds that the effect of the Proposed Strategic Housing Development is considered to be significant on the landscape of the Site and its immediate vicinity and will provide a distinctive intervention at the edge of the town and define a new sense of place in the context of the town and its amenities and pedestrian/cyclist connectivity. These attributes are beneficial aspects of effect on the suburban landscape. A comprehensive tree, shrub and groundcover planting strategy is proposed for the Site. Buffer planting will be provided along adjoining boundaries to the south and west of the Site. High quality hard and soft landscape treatments will be applied throughout the new scheme to provide attractive and uplifting public and private environments which will have seasonal variety and interest and will contribute to the biodiversity of the locality.

To assess the Operational Phase Visual Effects of the Proposed Development, a series of viewpoints were chosen at varying locations, elevations, distances and directions in order to represent a variety of viewers from a range of locations. They represent both sensitive visual receptors such as residents and other visual receptors in the vicinity of the Proposed Development Site. There are eight visual effects which are found to be significant (views 5, 7, 8, 10, 13, 14, 15 & 17). Of these, six are neutral in quality and the remaining two (views 7 & 8) are considered to be beneficial. For views 9 & 13 visual effects are Moderate/Slight & Neutral. The Proposed Development will have no effect from the remaining viewpoints (views 1, 2, 3, 4, 6, 11 & 12).

Cumulative effects relate to the potential combined impact of the Proposed Development in association with other recent developments or Proposed Developments in the vicinity of the Site. Cumulative effects in respect of these other developments in the locality have been assessed and are found to be Medium and Neutral in quality.

4.9 Archaeology and Cultural Heritage

An assessment of the baseline Archaeological, Architectural and Cultural Heritage conditions of the surrounding environment for the Proposed Development was completed, in order to determine any significant impacts that may arise as a result of the development and highlight any potential effects this may have on these resources.

The assessment commenced with a desktop study / paper survey which considered all available archaeological, architectural, historical, and cartographic sources. This information was used in order to assess any potential impact on the receiving environment and to identify measures to ensure the conservation of any monuments or features. The assessment also included an archaeological field survey of the lands within the Site boundary of the Proposed Development.

There are no records of any recorded monuments or architectural heritage structures within the Site boundary of the Proposed Development.

There are 11 No. recorded archaeological sites within the surrounding 1km study area. These comprise 4 Ringforts (CO098-015----, CO098-017001-, CO098-018----, CO098-019----), 2 Souterrains (CO086-094----, CO098-017002-), 1 Mill – unclassified (CO087-033----), 2 Country Houses – 18th century (CO098-016----, CO099-095----), 1 Religious house - Augustinian canon (CO098-020----) and 1 Excavation site (CO099-108----). None of these monuments are located within the close environs of the Proposed Development.

There are 2 No. Protected Structures located within the 1km study area. These comprise: Kilmoney House (RPS 00635) and a Warehouse (RPS 00579). The National Inventory of Architectural Heritage (NIAH) also lists an additional 6 No. buildings within the 1km study area. These comprise: Kilmoney Bridge (NIAH 20909818), Mount River House (NIAH 20909938), Cilldarragh House (NIAH 20909939), a former Rectory (NIAH 20987048), a former railway warehouse (NIAH 20987049) and Church of Our Lady and Saint John (NIAH 20987050). None of these structures are located within the close environs of the Proposed Development.

The Construction Phase will have no predicted effects on the known archaeological, architectural and cultural heritage resource of the area. Ground excavations will have the potential to result in negative effects on any sub-surface archaeological features that may exist within the footprint of the Proposed Development. A geophysical survey will be undertaken within undisturbed portions of the Proposed Development site prior to the commencement of the Construction Phase. This will be followed by a programme of linear archaeological test trenching which will include targeted investigations of any geophysical anomalies of archaeological potential. Any identified sub-surface archaeological features will remain *in-situ* while the National Monuments Service (Department of Housing, Local Government and Heritage) is consulted to determine appropriate further mitigation strategies, which may entail preservation by avoidance or preservation by record through full archaeological excavation.

There will be no effects on the archaeological, architectural or cultural heritage of the area through development activities that may occur during the Operational Phase.

4.10 Material Assets: Traffic

Martin Hanley Traffic and Transportation Consulting Engineers have been engaged by Reside Investments Ltd, to prepare a Traffic and Transport Assessment (TTA) for the Proposed Development.

Traffic counts were undertaken by Traffinomics Ltd. on Thursday 16th September 2021 for the morning peak hours of 07:30 - 09:30 and the evening peak hours of 16:30-18:30. Counts were undertaken at the junctions of R611 Mian Street / Church Hill Junction and Ballea R613 / Nova Court Housing Development. However following discussions with Cork County Council Transport Department, it was agreed that historic counts from 2018 (i.e., pre-pandemic) would be used. These counts were supplied by Cork County Council for traffic count undertaken on 1st May 2018.

The following are the main conclusions of the LinSig traffic analysis.

Junction 1 – Main Street R611 / R611 Kilmoney Road

- The maximum degree of saturation for the AM peak hour occurs on Church Hill in the design year 2039. The degree of saturation is measured at 71.1% with a mean maximum car queue length of 1.9 vehicles for the morning peak hour 08:15-09:15.
- The maximum degree of saturation for the PM peak hour occurs on the Kilmoney Road in the design year 2039. The degree of saturation is measured at 63.9% with a mean maximum car queue length of 8.9 vehicles for the evening peak hour 17:15-18:15. A short right hand turn lane should be provided on Kilmoney Road. The junction could

be signalised from 2029 onwards. For full Linsig results see Appendix 12C on the report.

Junction 2 - Western Relief Road / R611 Kilmoney Road

- The maximum degree of saturation for the AM peak hour occurs on the Kilmoney Road in the design year 2039. The degree of saturation is measured at 80.0% with a mean maximum car queue length of 16.4 vehicles for the morning peak hour 08:15-09:15.

- The maximum degree of saturation for the PM peak hour occurs on the Carrigaline Wester Relief Road and the Kilmoney Road in the design year 2039. The degree of saturation is measured at 91.5% with a mean maximum car queue length of 26.1 vehicles for the evening peak hour 17:15-18:15. A short right hand turn lane should be provided on Kilmoney Road if possible. For full Linsig results see Appendix 12C on the report.

Junction 3 - Western Relief Road / Proposed Development

- The maximum degree of saturation for the AM peak hour occurs on the CWRR in the design year 2039. The degree of saturation is measured at 33.0% with a mean maximum car queue length of 0.2 vehicles for the morning peak hour 08:15-09:15.

- For the Design years 2024, 2029,2039 PM scenarios, the LinSig traffic analysis shows that the maximum degree of saturation increases over time. The maximum degree of saturation occurs on the development access in the design year 2038 . The degree of saturation is measured at 50.2% with a mean maximum car queue length of 1.5 vehicles for the evening peak hour 17:15-18:15. For full Linsig results see Appendix 12C on the report.

- Junction sight distance of 49m to the north and south will be provided at 2.4m back from road edge measured for design speed of 50km/hr in accordance with DMURs.

- The junction will be provided with both road markings and signage indicating a STOP junction. The Development access will have 2No exit lanes and 1No entry lane. Tactile paving will be provided as per the Tactile Paving Guidelines. See drawing CM-RL-P01 (included in Appendix XX) for the proposed layout of the access junction.

Junction 4 - Western Relief Road / Internal Link Road

This is a proposed cross roads signalised junction with right turning lanes on all arms of the junction. For the. The maximum degree of saturation for the AM peak hour occurs on the CWRR in the design year 2029. The degree of saturation is measured at 52.4% with a mean maximum car queue length of 2.8 vehicles for the morning peak hour 08:15-09:15.

The maximum degree of saturation in the PM peak hours occurs on the Western Link Road in the design year 2039. The degree of saturation is measured at 57.1.% with a mean maximum car queue length of 10.6 vehicles for the evening peak hour 17:15-18:15. For full Linsig results see Appendix 12C on the report.

Junction 5 - Western Relief Road / R613 Ballea Road

- The maximum degree of saturation for the AM peak hour occurs on the CWRR in the design year 2039. The degree of saturation is measured at 75.3% with a mean maximum car queue length of 10.4 vehicles for the morning peak hour 08:15-09:15.

- The maximum degree of saturation for the PM peak hour occurs on the Ballea Road in the design year 2039. The degree of saturation is measured at 64.8% with a mean maximum car queue length of 8.2 vehicles for the evening peak hour 17:15-18:15. For full Linsig results see Appendix 12C on the report.

Junction 6 – Roundabout Cork Road R611 / Ballea Road R613

- The existing roundabout junction is operating within capacity in the base year 2018 for the morning peak hour. The maximum degree of saturation for the AM peak hour occurs on Arm C Main Street for the design year 2039. The degree of saturation is measured at 79.8% with a mean maximum car queue length of 51. vehicles for the morning peak hour 08:15-09:15.

- The Arcady traffic analysis shows that for the PM peak hour the maximum degree of saturation occurs on Arm D Main Street for the design year 2039. The degree of saturation is measured at 89.6% with a mean maximum car queue length of 7.8 vehicles for the evening peak hour 17:15-18:15. For full Arcady results see Appendix 12D on the report.

Junction 7 – Church Road / R612 Crosshaven Road

- The maximum degree of saturation for the AM peak hour occurs on the Crosshaven Road in the design year 2039. The degree of saturation is measured at 104.3% with a mean maximum car queue length of 50.6 vehicles for the morning peak hour 08:15-09:15.

- The maximum degree of saturation occurs on the Cork Road in the design year 2039. The degree of saturation is measured at 92.6% with a mean maximum car queue length of 27.1 vehicles for the evening peak hour 17:15-18:15. For full Linsig results see Appendix C on the report. Modification to the traffic signal stages and timing will be required over time. The traffic signal arrangement involving seven stages as can be seem in Appendix 12C may help to improve traffic flows.

4.11 Material Assets: Utilities and Waste

This chapter of the EIAR provides an assessment of the potential impacts of the Proposed Development on ‘Materials Assets’ or the physical resources in the environment, including built services and infrastructure comprising electricity, gas supply, information and communi-cations technology (ICT), surface water/stormwater drainage, water supply, the foul water net-work and waste management infrastructure.

4.11.1 Electricity Supply

Construction related activities will require temporary connection to the local electrical supply network for lighting and construction actives. The power demand during the Construction Phase may also be supplemented with on-site diesel generators. Connecting a new multi-unit housing development to the electricity distribution system must be carried out in accordance with ESB Networks' specifications. A temporary suspension of the network locally to facilitate the connection works may be required during the construction Phase, and an additional temporary suspension will also occur when power is provided to the Site of the Proposed Development. These temporary suspensions will be controlled by ESB Networks as the statutory undertaker and in accordance with standard protocols. The potential impact from the Construction Phase of the Proposed Development on the local electrical supply network is likely to be negative, slight, and short-term. The impact of the Operational Phase of the Proposed Development on the electricity supply network is likely to be to increase demand to the existing supply. The impact from the Operational Phase on the electricity supply network is likely to be neutral, long term and not significant.

4.11.2 Gas Supply

There are no gas requirements during the Construction Phase of the Proposed Development and there will be no connections made to the natural gas network as part of the Proposed Development. As such, the potential impact from the Construction Phase on the gas supply network is likely to be permanently neutral and imperceptible. The Proposed Development will not be connected to the natural gas network. Heat Pumps powered by electricity will be used for space heating and domestic hot water during the Operational Phase. As such, the potential impact from the Operational Phase on the gas supply network is likely to be permanently neutral and imperceptible.

4.11.3 Information and Communications Technology (ICT)

National Broadband Ireland was set up by the Irish Government to facilitate the roll out of fibre broadband across the Country. The Department of the Environment, Climate and Communications have developed an interactive map which details the progress of the rollout of the National Broadband Plan. The High-Speed Broadband map identifies locations and premises as amber or blue and the map is updated on a quarterly basis. Amber areas depict target areas for the State intervention of the National Broadband Plan. Blue areas indicated that commercial operators have instated or are in the process of delivering high speed broadband services. The Site of the Proposed Development is partially located within an area where high speed broadband is available and the closest mobile communications mast (Eir Mobile) is located at Owenabue Car Park, to the east of Cork Road (R611) approximately 300m east of the Site of the Proposed Development. A large mast hosting antennae for Tree, Vodafone, Imagine and Eir is located 500m north-northeast of the Site behind the Intreo Office off the Ballea Road (R613). Some local diversions may be required in the upgrade works of the controlled pedestrian crossing and new proposed ducting works. This is envisaged to be a negative, slight and temporary impact which will only exist during the Construction Phase. The increased demand on existing telecommunications infrastructure as a result of the Proposed Development is likely to have a be neutral and imperceptible impact in the long term.

4.11.4 Water Supply and Demand

Site offices and construction activities will create a demand for water supply to the Site. A temporary connection is required to facilitate on-site works for all housing developments. Commencement of construction will therefore result in a net increase in the water demand for the Site of the Proposed Development. The Proposed Development will be connected to the existing mains water supply. Irish Water have confirmed that connection to the existing mains water supply network is feasible without any upgrades to the existing infrastructure. Some local diversions may be required to water supplies to accommodate the construction works which may require temporary outages. Additionally, new connection works may cause water supply disruptions during the Construction Phase. These disruptions will be controlled by Irish Water and Cork County Council in accordance with standard protocols. All watermains will be laid strictly in accordance with Irish Water's standard protocols, and valves, hydrants, scour and sluice valves and bulk water meters will be provided in accordance with the requirements of Irish Water. Due to the nature of the works during the Construction Phase, the likely impacts on the local mains water supply will be negative, not significant and temporary. During the Operational Phase of the Proposed Development there will be a demand for water from the public water supply. The mains water supply is operated in accordance with relevant existing statutory consents and Irish Water have confirmed that, based on a desk top analysis of the capacity currently available in the Irish Water network(s) as assessed by Irish Water, the proposed demand can be facilitated. The likely impact of the increase in mains water demand will be neutral and not significant on mains water supply in the long-term.

4.11.5 Water Environment – Hydrology and Surface Water Drainage

It is noted that specific issues relating to Hydrology associated with the Proposed Development are set out in Chapter 7 of this EIAR. A Surface Water Drainage Strategy has been prepared for the Site of the Proposed Development and the surface water drainage system will be attenuated. The maximum permitted surface water outflow will be restricted to greenfield run-off rates, thereby managing any increase in runoff to the River Owenabue. It is considered that the Surface Water Drainage Strategy is in line with the objectives of the Water Framework Directive (2000/60/EC). Due to the proximity of the Site to the River Owenabue, specific avoidance, remedial and mitigation measures will be taken during the Construction and Operational Phase with respect to the water environment. All works will be carried out in accordance with the Construction and Environmental Management Plan prepared for the Proposed Development and the Irish Water Code of Practice for Water Infrastructure (July 2020) and the Irish Water Code of Practice for Wastewater Infrastructure (July 2020).

4.11.6 Wastewater Management

A temporary connection is required to facilitate on-site works for all housing developments. It will be the Main Contractor's responsibility to apply to Irish Water for connections to the existing foul water network, and all connections to the foul water network will be constructed strictly in accordance with Irish Water's requirements. Due to the temporary and phased nature of the Construction Phase the likely effect of the Proposed Development on the existing foul water network during this phase is considered to be negative, slight and temporary. Foul water from the Operational Phase of the Proposed Development will be discharged via a newly constructed onsite pumping station to an existing foul water sewer on Kilmoney road where it will flow to Cork Lower Harbour WwTP. This increase in wastewater being discharged to the public

sewer will have a neutral and imperceptible impact on the capacity of the Cork Lower Harbour WwTP in the long term.

4.11.7 Waste Management

A Construction and Demolition Waste Management Plan (CDWMP) has been prepared for the Construction Phase of the Proposed Development (Enviroguide Consulting, 2022). All waste generated during the Construction Phase will be segregated onsite to enable ease in re-use and recycling, wherever appropriate. In general, the priority of the CDWMP shall be to promote recycling, reuse and recovery of waste and diversion from landfill wherever possible. After in-situ reuse and recycling options have been fully considered, all residual waste streams will be collected by appropriately authorised waste collection contractors and will be managed using suitably permitted/licensed waste disposal or materials recovery facilities. Due to the use of permitted/licensed waste collection/waste management facilities, it is not predicted that the production of waste will cause any likely significant effects on the environment. It is the responsibility of the Main Contractor to ensure that waste collection contractors are legally permitted to carry the waste, and that the facility they bring the waste to is licensed to handle that type of waste as outlined in the Waste Management Acts 1996-2005. Any surplus soils that cannot be reused on site will be removed offsite and may be reused elsewhere. The removal of any surplus soil offsite will be undertaken in accordance with applicable statutory requirements. This may include, wherever suitable, removal as by-products that meet the legislative requirements of Article 27 of the European Communities (Waste Directive) Regulations, 2011 (S.I. No 126 of 2011). Material will only be moved under an Article 27 By-product notification when it can be robustly demonstrated that all tests for Article 27 By-product are met.

An Operational Waste Management Plan (OWMP) has been prepared for the Proposed Development by Enviroguide Consulting (2022). The OWMP contains full details of the types and quantities of waste that may arise at the Proposed Development. The typical wastes that will be generated during the Operational Phase of the Proposed Development will include the following:

- Dry Mixed Recyclables (DMR)
- Organic waste
- Glass
- Mixed Non-Recyclable (MNR) / General Waste

The Commercial Units will generate similar waste types to domestic waste types. There will be some additional waste types generated in small quantities which will need to be managed separately including:

- Green / garden waste may be generated from internal plants or external landscaping
- Batteries (both hazardous and non-hazardous)
- Waste electrical and electronic equipment (WEEE) (both hazardous and non-hazardous)
- Printer cartridges / toners
- Chemicals (paints, adhesives, resins, detergents, etc.)
- Light bulbs (Fluorescent Tubes, Long Life, LED and Filament bulbs)
- Textiles (rags)

- Waste cooking oil (if any generated by the residents or creche tenants)
- Furniture (and from time-to-time other bulky wastes)
- Abandoned bicycles

In the absence of mitigation, the potential impact from the Construction and Operational Phases on waste disposal has the potential to be negative and moderate in the long term. Provided the mitigation measures detailed in the CEMP (Enviroguide Consulting, 2022), the CDWMP (Enviroguide Consulting, 2022) and the OWMP (Enviroguide Consulting, 2022) are implemented, and a high rate of reuse, recycling and recovery is achieved, the likely effect of the Construction and Operational Phases on the environment will be neutral and imperceptible in the long term. Additionally, the project design of the Proposed Development has facilitated the improvements required to service the Site without negatively impacting the local existing utilities.

4.12 Risk Management

Risk is one of the most important elements to be considered as part of a development. It is critical that any project is screened against potential risks which it might encounter and/or impose on the nearby environment during its Construction and Operational Phases. An assessment of the vulnerability of the Site of the Proposed Development to risks of major accidents and/or disasters was completed.

The assessment reviewed:

- The vulnerability of the project to major accidents or disasters.
- The potential for the project to cause risks to human health, cultural heritage and the environment, as a result of that identified vulnerability.

A methodology was used including the following phases:

- Phase 1 – assessing the hazards
- Phase 2 – screening the hazards
- Phase 3 – mitigating the hazards and evaluating the residual hazards

The risk assessment conducted for the Proposed Development at Kilmoney Road, Carrigaline, Co. Cork concludes that the vulnerability of the Proposed Development to major accidents and/or disasters is not considered significant; and the potential for the project to cause risks to human health, cultural heritage, and the environment, is not considered significant.

4.13 Interactions

Interrelationships between various environmental aspects must be considered when assessing the impact of the Proposed Development, as well as individual significant impacts. The significant impacts of the Proposed Development and the proposed mitigation measures have been detailed in the relevant chapters of this report. However, as with all developments that poses potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts. This chapter of the EIAR addresses the interactions between the various environmental factors of the Proposed Development.

When considering interactions, the assessor has been vigilant in assessing pathways – direct and indirect – that can magnify effects through the interaction. In practice many impacts have slight or subtle interactions with other disciplines. However, the EIAR concludes that most inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the construction and operation of the Proposed Development.

4.14 Mitigation and Monitoring Measures

This EIAR has assessed the impacts and effects likely to occur as a result of the Proposed Development on the various aspects of the receiving environment.

The Proposed Development will be operated in a manner that will ensure that the potential impacts on the receiving environment are avoided where possible. In cases where impacts or potential impacts have been identified, mitigation measures have been proposed to reduce the significance of specific impacts. These mitigation recommendations are contained within each chapter exploring specific environmental aspects.