

VOLUME 1

Non-Technical Summary

Environmental Impact Assessment Report (EIAR) for a Strategic Housing Development Application at Lahardane and Ballincolly, Ballyvolane, Cork

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Glossary of Terms

BSTC Ballyvolane Strategic Transport Corridor
CASP Cork Area Strategic Plan
CEMP Construction Environmental Management Plan
CFRAM Catchment Flood Risk Assessment and Management Studies
CMATS Cork Metropolitan Area Transport Strategy
DEAP Dwelling Energy Assessment Procedures
DMURS Design Manual for Urban Roads and Streets
EIA Environmental Impact Assessment
EIAR Environmental Impact Assessment Report
EMP Environmental Management Procedures
EPA Environmental Protection Agency
LAP Local Area Plan
NIAH National Inventory of Architectural Heritage
NIS Natura Impact Statement
NMS National Monuments Service
NOR Northern Orbital Route
NTA National Transport Authority
NTS Non-Technical Summary
NZEB Near Zero Energy Buildings
OPW Office Public Works
PV Photo Voltaic
PWSA Project Works Services Agreement
QBC Quality Bus Corridor
RTPI Real-time Public Information
SUDS Sustainable Urban Drainage Systems
SWRM South West Regional Model
TII Transport Infrastructure Ireland
TTA Traffic and Transport Assessment
WFD Water Framework Directive

1.0 Introduction

An Environmental Impact Assessment Report (EIAR) has been prepared in support of a Strategic Housing Development application to An Bord Pleanála on behalf of Longview Estates Ltd. This Non-Technical Summary is Volume I of the EIAR. The EIAR and appendices are included in Volume II.

Longview Estates Ltd are applying for planning permission at a site located in the townlands of Lahardane and Ballincolly, Ballyvolane, Cork as outlined in Figure 1.1. The proposal includes 753 no. residential units, a local centre including retail, a crèche, doctors surgery and community use and all associated and ancillary infrastructure and development works to be developed over six phases of development.

Figure 1.1 Site Location



1.1 Purpose of the EIAR

The purpose of the EIAR is to identify and predict the likely significant environmental impacts of the proposed development; to describe the means and extent by which they can be reduced or ameliorated; to interpret and communicate information about the likely impacts; and to provide an input into the decision making and planning process.

The preparation of the EIAR is carried out by competent experts, with appropriate expertise to provide informed assessment on their specialist 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.

1.2 Requirement for an EIAR

Annex I of the EIA Directive 85/337/EC requires as mandatory the preparation of an EIA for all development projects listed therein.

Schedule 5 (Part 1) of the Planning & Development Regulations 2001 (as amended) transposes Annex 1 of the EIA Directive directly into Irish land use planning legislation. The Directive prescribes mandatory thresholds in respect to Annex 1 projects.

Annex II of the EIA Directive provides EU Member States discretion in determining the need for an EIA on a case-by-case basis for certain classes of project having regard to the overriding consideration that projects likely to have significant effects on the environment should be subject to 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 classes of development set out in Part 2 of Schedule 5. The applicable categories are as follows:

Infrastructure Projects

10. (b)

(i) Construction of more than 500 dwellings and

(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 triggers a requirement for an EIA because the number of dwellings proposed is 753 which exceeds the threshold of 500 specified in 10b (i) above and the overall site area is 46.77Ha which is in excess of the 20 hectares threshold for urban development elsewhere in 10b (iv) above.

1.3 Format and Structure of the EIAR

The members of the design team and their specific contribution to the preparation of this EIAR are outlined in table 1.1 below and at the beginning of each Chapter within the EIAR.

Table 1.1 EIAR Chapter Headings and Contributors

Chapter	Consultant	Person Responsible and Qualifications and Summary of Experience
Chapter 1 Introduction	Cunnane Stratton Reynolds	<p>Orla O'Callaghan, BA, MPlan, MIPI</p> <p>Orla is a Senior Planner in Cunnane Stratton Reynolds. She has both private and public sector experience in Ireland and the UK. Orla has been involved in the preparation of a number of EIAR's.</p>

Chapter 2 The Development	Cunnane Stratton Reynolds, MHL and Associates Ltd and Horgan Carroll Architects	Orla O’Callaghan, BA, MPlan, MIPI
Chapter 3 Alternatives Examined	Cunnane Stratton Reynolds and Horgan Carroll Architects	Orla O’Callaghan, BA, MPlan, MIPI
Chapter 4 Population and Human Health	Cunnane Stratton Reynolds	<p>Elaine Edmonds, BA Hons Environmental Science, MSc Spatial Planning and MSc Urban Development and Regeneration.</p> <p>Elaine is an Executive Planner in Cunnane Stratton Reynolds. Elaine has a specialist interest in environmental planning and has been involved in the preparation of a number of EIAR’s.</p>
Chapter 5 Land and Soils	MHL and Associates Ltd	<p>Ken Manley, BE CEng, MIEI, RConsEI HDip Env Eng. Ken is a company director and founding member of MHL and Associates Ltd. He is a member of the <i>Institute of Engineers Ireland (IEI)</i> and the <i>Association of Consulting Engineers of Ireland (ACEI)</i>.</p>
Chapter 6 Water and Hydrology	MHL and Associates Ltd and JBA Consulting	<p>Shane Moriarty. Shane is a graduate of Cork Institute of Technology having graduated in 2010 with an Honours Bachelor degree in Sustainable Energy Engineering and an Ordinary Bachelor’s degree in Civil, Structural and Environmental Engineering. Shane is currently a Design Engineer with MHL having worked in the United States for eight years as an Engineer for</p>

		a large natural gas distribution company and a Project Manager in the steel industry.
Chapter 7 Air Quality and Climate	EC Environmental	Dr Eoin Collins. Eoin holds a BSc (Hons) in Chemistry (UCD), a PhD in Air Quality (UCD) and an MSc in Energy Management (DIT). He is a member of the Royal Society of Chemistry (MRSC), a member of the British Occupational Hygiene Society (BOHS), and is a current Council member and past president of the Occupational Hygiene Society of Ireland (OHSI). He has over 18 years' experience as a consultant in the field of air quality and has conducted air quality and climate impact assessments for many major infrastructural and commercial projects.
Chapter 8 Noise and Vibration	CLV Consulting	<p>Brian Johnson, Bachelor of Science in Acoustical Engineering Purdue University 1994</p> <p>Certificate of Competence in Building Acoustic Measurements Institute of Acoustics 2016</p> <p>Certificate of Competence in Environmental Noise Measurements Institute of Acoustics 2017</p> <p>LEED Certified Green Professional United States Green Building Council 2015</p> <p>Brian Johnson is an internationally</p>

		experienced acoustic consultant who has been working in the fields of architectural / building acoustics and noise control since 1994. His primary role has been conducting the architectural and mechanical acoustic design for large scale projects of all types over a wide range of geographies. He has also has extensive experience in the field of environmental noise assessments and building acoustic commissioning testing.
Chapter 9 Material Assets Part A Utilities, Services and Waste Part B Traffic and Transport	MHL and Associates Ltd and Cunnane Stratton Reynolds	Ken Manley (MHL) and Orla O’Callaghan (Cunnane Stratton Reynolds) Ken Manley (MHL)
Chapter 10 Biodiversity	Greenleaf Ecology	Karen Banks, BSc (Hons) in Environment and Development from Durham University, and a full member of the Chartered Institute of Ecology and Environmental Management. Karen is an ecologist with 12 years’ experience in the field of ecological assessment Karen specialises in ecological field survey and impact assessment.
Chapter 11 Cultural Heritage	John Cronin and Associates	Tony Cummins – primary and post-graduate degrees in Archaeology (B.A. (UCC), 1992) and M.A. (UCC), 1994) John Cronin – Archaeology (B.A.

		<p>(University College Cork (UCC), 1991), Regional and Urban Planning (MRUP) (University College Dublin (UCD) 1993) and post-graduate qualifications in Urban and Building Conservation (MUBC (UCD), 1999)</p> <p>Both individuals have each amassed twenty-five years industry experience in the compilation of archaeological, architectural and cultural heritage impact assessments.</p>
Chapter 12 Landscape and Visual Impact	Cunnane Stratton Reynolds	<p>Jim Kelly, B.Agr.Sc. Landscape Architecture, (University College, Dublin), Post Graduate Diploma Landscape Architecture</p> <p>(University of Central England), Chartered Landscape Architect, CMLI (UK), Member of the Irish Landscape Institute MILI</p> <p>Jim Kelly is a chartered landscape architect with 30 years of experience in the field of landscape planning, design and management.</p> <p>Landscape and Visual Impact Assessment (LVIA), and their input to EIA is a core discipline of the practice and Jim has prepared LVIA reports for a wide range of development projects in the last 14 years</p>
Chapter 13 Risk Management	Cunnane Stratton Reynolds	Ken Manley (MHL)
Chapter 14 Interaction of the Foregoing	Cunnane Stratton Reynolds	Orla O'Callaghan, BA, MPlan, MIPI

Chapter 15 Summary of Mitigation and Monitoring	Cunnane Stratton Reynolds	Orla O’Callaghan, BA, MPlan, MIPI
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1.4 Consultation

Consultation has been an integral part of the design of the proposed development. At an early stage in the development of the scheme layout a number of statutory consultees and authorities were sent letters offering them the opportunity to give feedback on the layout proposed. These consultees included:

- Irish Water
- The Minister for Arts, Heritage, Regional, Rural and Gaeltacht Affairs
- The Heritage Council
- An Taisce – The National Trust for Ireland
- Córas Iompair Éireann
- Transport Infrastructure Ireland (TII)
- National Transport Authority (NTA)
- Commission for Energy Regulation
- Irish Aviation Authority
- The Department of Education and Skills
- Local Childcare Committee – Cork County and Cork City Childcare Committee
- The Commission for Railway Regulation
- Department of Justice and Equality
- The Health Service Executive
- The Minister for Agriculture, Food and the Marine

There has been extensive consultation with Cork City and County Councils since 2017. There have been two tripartite meetings with An Bord Pleanála.

1.5 Information to be contained in a Non-Technical Summary

This Non-Technical Summary (NTS) has been prepared in accordance with *inter alia* the requirements of the EU 2014 EIA Directive, Planning and Development Acts 2000-2018 as well as the Planning and Development Regulations, 2001, as amended (in particular by the European Union (Planning & Development) (Environmental Impact Assessment) Regulations 2018.

2.0 Proposed Development

Chapter 2 of the EIAR – Proposed Development 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 Planning Application Site Location and Description

The site the subject of this Strategic Housing Development application is located in the townlands of Lahardane and Ballincolly, Ballyvolane, Cork within the administrative area of Cork City Council. The application site forms part of an area which has been promoted as a growth location to accommodate a significant increase in population since the Cork Area Strategic Plan (CASP) was published in 2001. This area is known as the Ballyvolane Urban Expansion Area.

The lands are situated less than 3km to the north east of the City Centre and just 1.5km to the north of Ballyvolane District Centre. The lands are currently accessible from the Ballyhooly Road and the local road to the north of the site.

The application site is generally open in character, comprising fields which are currently in agricultural use. The topographical survey included with this planning application shows the very significant level changes particularly to the west of the site. The site levels increase from approximately 65m OD on the western side of the site to 130m OD in the eastern part.

There are no recorded architectural heritage or archaeological sites located within the proposed development site. There are no buildings of any date located within the site.

The site area is generally characterised by agricultural and residential development. Beyond the northern boundary there are a small number of “one-off” dwellings which are accessed from the local roadway to the north. To the south of the site there are fields which also form part of the zoned lands within the urban expansion area. These are currently in agricultural use. As indicated on the site location map for this planning application, the applicant owns a large portion of the land to the south of the site which is bordered to the west by the Ballyhooly Road. The applicant has made a commitment to Cork City Council to keep these lands free of development until a decision is made regarding the final alignment of the proposed link road which will connect the Ballyhooly Road and the Northern Relief Road in Mayfield. The alignment is indicated as running through the applicants’ lands in the Cobh Municipal District Local Area Plan (LAP).

There are open fields to the east of the site which form part of the urban expansion area. Pedestrian and vehicular access from the applicant’s site to these lands will be possible when they are developed. The Ballyhooly Road borders the site to the west. There are two accesses proposed from the Ballyhooly Road.

2.2 Development Description

In summary Longview Estates Ltd intend to apply for a ten year planning permission for a strategic housing development consisting of 753 residential units to be constructed in a series of phases (six neighbourhoods in total), a local centre including retail (2 no. units), a crèche, doctors surgery and community use unit and all associated and ancillary infrastructure, services and site development works. Two no. site vehicular accesses are proposed from the Ballyhooly Road and a third vehicular access from the local road to the north of the site

The site layout plan is indicated in Figure 2.1 below.

The proposed 753no. residential units are comprised of the following:

- 67 no. detached houses including 31 no. 4 bedroom units and 36 no. 3 bedroom units
- 278 no semi-detached houses including 41 no. 4 bedroom units and 237 no. 3 bedroom units
- 186 no. terrace houses including 18 no. 4 bedroom units, 96 no. 3 bedroom units and 72 no. 2 bedroom units
- 69 no. duplexes including 36 no. 3 bedroom units and 33 no. 2 bedroom units
- 153 no. apartments including 6 no. studio apartments, 42 no. 1 bedroom apartments, 79 no. 2 bedroom apartments and 26 no. 3 bedroom apartments. Three apartment blocks will be provided (2 no. in Neighbourhood 6 and 1 no. in Neighbourhood 2).

A full schedule of accommodation is enclosed at appendix 2.1 of the EIAR. The associated site and infrastructural works include water supply, foul and surface / storm water drainage infrastructure to local services and drains and 7 no. unit sub stations. The proposed development makes provision for two no. pumping stations (and connections to / from same), one in neighbourhood 5 and one adjacent to the Ballyhooly Road, with access, to serve this site and future lands as required by Irish Water.

layer of play value. The focus will be on natural play and features within the play areas will include stepping stones, balance beams and logs, tunnels and grass mounds and integrated slides.

2.4 Construction Activities and Management

Due to the nature and size of the proposed development, the potential impacts of the construction stage must be considered. The construction stage will involve typical site work components including site clearance and preparation, excavation, stockpiling, removal of material or re use elsewhere on site, infrastructural works and landscaping. The potential impacts from the construction phase include increased volume of traffic in the area as a result of construction associated traffic, noise and vibration disturbance as a result of construction activity and dust in the air and debris on local roads.

A Construction and Environmental Management Plan (CEMP) prepared by MHL and Associates accompanies this planning application. The proposed CEMP details measures to avoid, reduce or mitigate the construction impacts wherever possible. In considering the potential impacts that may occur during the construction of the proposed development the CEMP sets out Environmental Management Procedures (EMPs) that have been developed and will be implemented to manage the environmental impacts of activities associated with the construction of the proposed development. The EMP's are set out in Table 2.1.

Table 2.1 Environmental Management Procedures

Reference	Procedure:-
EMP-1	Fuel and Oil Management
EMP-2	Traffic Management
EMP-3	Waste Management
EMP-4	Noise Management
EMP-5	Dust Management
EMP-6	Site Environmental Training and Awareness
EMP-7	Environmental Emergency Response
EMP-8	Monitoring and Auditing Procedure
EMP-9	Environmental Accidents, Incidents and Corrective Actions Procedure
EMP-10	Environmental Complaints Procedure
EMP-11	Odour Control Procedure
EMP-12	Light Pollution Control Measures
EMP-13	Surface Water Management and Run-off Control Measures

3.0 Alternatives Examined

Chapter 3 of the EIAR includes a summary of the alternatives that were examined for the proposed development. The design of the proposed development has evolved over a number of iterations, responding to environmental considerations, advice received from Cork City Council at pre-planning stage and direction provided by An Bord Pleanála at the pre-application consultation stage. The principal environmental considerations that informed alternative layouts included the qualities of the urban environment to be delivered (place making in the Urban Expansion Area), population and human health (density of the proposed development, communal amenity spaces and permeability and connectivity), impact on land and soils, water and hydrology, traffic and transport and landscape and visual impact.

With regard to the (preferred) final layout Alternative 4, the design development process had considered a number of alternative site layouts with the objective of producing a new high-quality residential development, which has undergone a robust consideration of relevant alternatives having regard to the comparison of environmental effects and that meets the requirements of the EIA Directive, based on the multidisciplinary review across all environmental topics.

4.0 Population and Human Health

Chapter 4 of the EIAR assesses the potential impacts of the proposed development on population and human health that are not covered elsewhere in the EIAR. A number of factors are considered in this regard, including the following:

- Land Use Patterns
- Housing
- Population
- Employment
- Community Facilities
- Human Health

The predicted impacts on population and human health are considered in terms of the following:

- Do Nothing Impacts
- Construction Phase Impacts
- Operational Phase Impacts
- Major Accidents and Disasters

In the 'do nothing' scenario, as the proposed development would not proceed there would be no immediate impacts on the existing population. However, if the site is not developed, the projected population for the Ballyvolane Urban Expansion Area will not be achieved. Because of the importance of the Ballyvolane Urban Expansion to the delivery of housing in the Northern Environs and the greater Metropolitan Cork area in achieving the projected growth for Cork under the National Planning Framework and because of its strategic location beside Cork City Centre, if the site is not developed, it will have a long term negative impact upon housing supply for Cork City

There will be minor impacts during the construction stage but these will be temporary and negligible in nature. A series of mitigation measures will be introduced to address any negative impacts during the construction of the proposed development. Potential impacts arising from the construction phase such as impacts on traffic, noise, air quality and visual

amenity are also addressed in other chapters of this EIAR. The construction stage will provide for additional employment in the North Environs and surrounding areas. It is expected that the proposal will provide an average of 80 no. construction jobs per phase with varying numbers of employees on site during different phases of construction peaking at approximately 100 on site at any given time. In addition to direct employment, there will be substantial off site employment and economic activity as a result of the supply of construction materials and the provision of professional services associated with the project.

Once operational, the proposed development of 753 new homes will impact positively on housing provision for Cork City through the development of a site which is located in a designated urban expansion area and predominantly zoned for residential development in close proximity to the City Centre. The development of a high-quality residential development comprised of a range of house types and sizes at this site will help to reinvigorate the northern suburbs and rebalance the city in accordance with the objectives of the Cork County Development Plan.

Operationally, the proposed development will have an ongoing positive impact on the local economy as it will help to sustain local services in the North Environs and it will provide housing for people close to the City Centre with access to jobs there and in employment zones in the north of the city. The proposed crèche, retail and doctors surgery will also provide some employment within the development.

Once operational, the additional population will create an additional demand for community facilities in the area including primary and secondary school places and crèche places. There is capacity in some schools closest to the site and as the proposed development is to be phased, it will take a number of years to reach peak demand for school places. It must also be noted that some children may attend schools further from the site. The Department of Education and Skills are constantly monitoring demographics to determine the need for schools provision. Engagement has occurred with the Department and Education and Skills who have confirmed that they no current plans for the development of a school in Ballyvolane.

A crèche of 692.88sq.m to cater for approximately 103 no. children is being proposed as part of the development. The size and design of the crèche was determined by a Childcare Assessment carried out during the design process and from discussions with the local childcare committee – Cork City Childcare Committee. The Childcare Committee have confirmed that the proposed crèche will meet the projected childcare needs in this area and the surrounding area.

The proposed development has the potential to impact on human health in a number of ways through factors considered within particular specialities, for example noise and air quality. These potential impacts have been considered in other chapters of the EIAR and as such there are no negative human health impacts associated with the proposed development.

In terms of design and layout of the proposed development, the design provides for the segregation of pedestrians and traffic through dedicated off road paths and cycleways and incorporates the principles of universal access and the requirements of Part M of the Building Regulations so that the development will be readily accessible to all, regardless of age, ability or disability. The proposed scheme prioritises both pedestrian and cyclists with the infrastructure proposed and thus promotes active movements for future occupants.

Overall, the operational phase of the proposed development, in terms of human health is anticipated to have significantly positive impacts locally with a permanent duration.

In terms of energy efficiency, the proposed development has been designed to be compliant with The Building Regulations, Technical Guidance Document Part L, Conservation of Fuel and Energy – Dwellings, 2019. All residential units are designed to meet Near Zero Energy Buildings (NZEB) standards. Preliminary Dwelling Energy Assessment Procedures (DEAP) have been carried out and the results confirm that compliance with NZEB will be comfortably achieved. The assessments also set out the potential for further and future improvement in efficiencies of up to 30% with the addition of photo voltaic (PV) technologies. Houses and apartments will achieve A2 / A3 Building Energy Ratings with the potential for improvement to A1 with the addition of PV technology.

5.0 Land and Soils

Chapter 5 of the EIAR comprises of an assessment of the impact of the proposed development on soils and the geological environment. The assessment involved the completion of a desk study and site walkover. The assessment also included site investigations by Priority Geotechnical Ltd that were carried out at the site in 2017 and 2019.

5.1 Receiving Environment

The site is greenfield and has been in agricultural use for a number of years. A topographical survey of the proposed site indicates that elevations vary from: ~61m OD in the south west corner of the site; ~75m OD in the north west corner of the site; ~125m OD in the north east corner of the site; and ~128m OD in the south east corner of the site. Teagasc sub-soil mapping indicated the superficial deposits in the area were characterised by glacial till derived from Devonian sandstones.

The bedrock is largely covered by till derived from Devonian sandstones. In the south east of the site there are gravels derived from Devonian sandstones. In the surrounding region, there are localised areas of bedrock exposed at the ground surface and Made Ground (Urban) areas lie to the south. The geological information is supported by site investigation data from September 2017 and February 2019 provided by Priority Geotechnical Ltd.

The ground model derived from the site investigation was such that topsoil was 200mm to 400mm thick; overlying mixed glacial deposits: firm slightly sandy gravelly Silt, firm slightly sandy (slightly) gravelly clay, medium dense to dense clayey gravelly sand, medium dense to dense (very) medium dense to dense silty (very) sandy gravel and medium dense to dense (very) clayey sandy gravel with variable cobble contents. The mixed glacial, superficial deposits overlay weak to medium strong sandstone/ siltstone 0.9m below existing ground level (bgl) to 4.3m bgl).

Laboratory testing was carried out in accordance with BS1377 (1990), *Methods of Test For Soils For Civil Engineering Purposes* and the ISRM suggested methods for rock characterisation, testing and monitoring. The purpose of carrying out these tests was to assess the re-usability of excavated materials as structural fill within the site. The results of these tests confirmed that the bulk of excavated materials on-site could be re-used as either structural fill or general fill depending on the level of improvement works carried out.

5.2 Potential Impacts

Site development works will include actions such as stripping of topsoil, excavation of sub soil layers, filling on excavated ground, construction traffic and associated construction /

ground works. It is expected that all excavated materials will be reused on site. In line with the findings of the site investigations carried out, it is anticipated that the bulk of excavated subsoil and rock will undergo soil improvement works on-site and will be reused as structural fill material under roads and in the build-up of housing platform areas. Un-treated subsoil will be used as non-structural fill (e.g. Build-up in back gardens, public open spaces and reprofiling the ground in the Park area).

Topsoil removal and replacement will be required to implement the required works throughout the proposed development. The removal and replacement of soil is a direct and permanent neutral impact on the soils and geology of the site as no topsoil is to be exported.

Subsoil and bedrock removal will be required where works require excavation to install services, house foundations, road formations, and other works as previously outlined. The removal of bedrock during excavation is a direct and permanent impact on the soils and geology. However, the site is not a designated County Geological Site.

The earthworks cut/fill balance for the proposed development has been designed to maximize reusability of materials within the site and reprofiling / relocation of excess top soil / rock if unusable, to the zoned "school site" is proposed as part of the preliminary Construction Environmental Management Plan (CEMP).

It is noted that during adverse weather conditions surface water runoff across the exposed subsoil could result in increased levels of standing water in excavated areas. This is addressed in the CEMP and proposes a system of silt fences and settlement ponds to control run-off in earthworks areas.

In the context of imported materials to site, these will be natural granular materials sourced from local quarries and will be used in the construction of road pavement foundations, drainage and services bedding materials and infill material in foundations.

Earthworks plant (e.g. dump trucks, excavators) and vehicles delivering construction materials to site (e.g. road aggregates, concrete deliveries, HGV's carrying prefabricated members etc.) have potential to cause rutting and deterioration of any exposed subsoil layers, resulting in erosion and generation of sediment laden runoff. This issue can result in deposition of mud and soil on the surrounding road network. Dust generation can also occur during extended dry weather periods as a result of construction traffic.

The above impacts on the land and soil is expected to be limited to the operations related to the construction works, and therefore is expected to be short term in nature. The vibrations and disturbance from vehicle and plant movements have the potential to compact the subsoil. This is a potential negative impact of imperceptible significance and of short-term duration.

During construction of the development, there is a potential risk from accidental pollution incidences. Accidental spillages which are not mitigated may result in the contamination of soils and groundwater underlying the site. Soil stripping and excavation for drainage lines will also reduce the thickness of subsoils in localised areas. In the case of soils, the magnitude of this impact is small adverse as it may result in the requirement to excavate a small portion of contaminated or polluted soil.

5.3 Mitigation Measures

Chapter 5 sets out a number of site-specific mitigation measures that are included within the CEMP to mitigate any impacts from the construction stage of the proposed development. These measures include:

- The moving and storage of excess material has been kept to a minimum and has informed the phased delivery of the scheme, N1-N2-N3-N4-N5-N6.
- Excavated material is to be stored on-site as outlined in the CEMP, to be re-used for later stages of the development.
- The preliminary site investigation has identified that certain quantities of subsoil will require soil strengthening methods for re-use as structural fill. These works will be carried out on site within the designated area. This area will include provisions to control the run-off of storm water.
- Given the topography of the site, control measures to protect surface waters from contamination will be put in place prior to the commencement of any site works.
- Required temporary storage of topsoil will be carefully managed to prevent any potential negative impact on the receiving environment. The material will be separated from any surface water drains, and the movement of material will be minimised in order to reduce degradation of soil structure and generation of dust. At any time, the extent of topsoil strip will be limited to the immediate vicinity of the active work area.
- Topsoil stockpiles will be protected during the construction stage through compaction of the exposed layers. These stockpiles will be placed so as to avoid damage by surface water flow.
- All excavated materials will be visually assessed for signs of possible contamination such as staining or strong odours. No Site Investigation samples have found materials that are contaminated. However, any samples of any unusual staining or odour will be collected and analysed for the presence of possible contaminants.
- Any excavated soil which is determined to be contaminated will be managed according to best practice and disposed of accordingly by a licensed waste disposal contractor.
- Stockpiles of excavated subsoil materials will be protected for the duration of the works in the area designated in the CEMP and will be separated according to reuse.
- With regard to imported fill no large or long-term stockpiles of fill material will be held on the site. At any time, the extent of fill material held on site will be limited to that needed in the immediate vicinity of the active work area.
- All vehicles delivering to the site will be required to use installed wheel wash facilities at entrances. Road sweeping and dust suppression measures will be implemented as necessary.
- Vehicles using the site will be confined to pre-determined haul routes around the site to reduce the area of disturbed ground and limit the potential for soil disturbance and sediment run off.
- To minimise any impact on the underlying subsurface strata from material spillages, all oils, solvents and paints used during construction will be stored within temporary bunded areas.
- Oil and fuel storage tanks shall be stored in designated areas, and these areas shall be bunded to a volume of 110% of the capacity of the largest tank/ container within the bunded area(s) (plus an allowance of 30 mm for rainwater ingress). Drainage from the bunded area(s) shall be diverted for collection and safe disposal.
- Refueling of construction vehicles and the addition of hydraulic oils or lubricants to vehicles will take place in a designated area (or where possible off the site) which will be away from nearby surface water gully's or drains.
- All ready-mixed concrete will be brought to site by truck. It is recommended that a suitable risk assessment for wet concreting will be completed prior to works being carried out which will include measures to prevent discharge of alkaline wastewaters or contaminated storm water to the underlying subsoil.

- The pouring of concrete will take place within a designated area using a geosynthetic material to prevent concrete runoff into the soil/ groundwater media

The implementation of the construction phase mitigation measures highlighted above will ensure that the soils geology and hydrogeological environment is not adversely impacted during normal and/ or emergency conditions during the construction phase. There are no predicted impacts on lands and soils arising from the operational phase.

6.0 Water and Hydrology

This chapter comprises of an assessment of the impact of the proposed development on the surrounding surface water and hydrological environments (including flood risk, surface water drainage, foul drainage, and water supply). The assessment included the following activities:

- Site inspection/Walkover
- Review of existing topographical survey data
- Review of existing services drawings (Irish Water, Cork County Council, Cork City Council)
- Site Investigation Report including trial pits, infiltration testing, boreholes (Study carried out by Priority Geotechnical)
- Review of information available on the Environmental Protection Agency (EPA) online mapping service
- Review of information available on the Geological Survey of Ireland (GSI) online mapping service
- Review of Office of Public Works (OPW) National Flood Hazard Mapping and CFRAM Studies (Catchment Flood Risk Assessment and Management Studies)

A number of meetings with Cork City Council Drainage Department have taken place to agree the scope and method of the stormwater drainage solution for the proposed development. Tie-in locations to the existing storm sewer and allowable discharge flow rates as well as preferred type of attenuation tanks have been agreed. The proposed system is in accordance with Sustainable Urban Drainage Systems (SUDS) and has been fully agreed with the Senior Drainage Engineer in Cork City Council. Substantial pre-planning engagement also occurred with Irish Water on the design of foul water infrastructure; a statement of design compliance has been obtained from Irish Water and is included with this planning application.

6.1 Receiving Environment

The site lies within Hydrometric Area 19, the EPA Classification for catchments flowing into the River Lee, Cork Harbour and Youghal Bay. The site lies between Water Framework Directive (WFD) River Sub Basins Glennamought Trib Bride_010 and Bride (Cork City) 020 and is within the South Western River Basin District (IESW). The Transitional Water Quality 2010-2012 had the Lee (Cork) Estuary Lower at an Intermediate Status.

The River Bride lies 1km west of the site and flows south to join the River Lee in Cork. The Lee Estuary is a designated Water Framework Directive (WFD) transitional water body (IE_SW_060_0950), with an ecological status of Moderate, and deemed to be At Risk. There are no water quality Q values in the transitional portion of the River Lee. Currently, an existing watercourse runs north to south on the western side of Ballyhooly Road. This serves as an outfall for surface water falling on the public road and new housing to the north. As the site falls naturally from the east to the west, it is proposed to construct two surface water outfalls (Outfall 1 and Outfall 2) to the watercourse running on the western

side of Ballyhooly Road. Outfall 1, which is to serve Neighbourhood 4, will facilitate recharging of this tributary during periods of low flow.

The regional groundwater flow direction will mimic that of topography and catchment drainage; flowing south west to the River Bride. An approximate groundwater level contour map produced from the initial site investigation data indicates that the overall gradient of the water table mimics that of the site's topography. Since February 2019, water levels have generally fallen and become steady from March to April, this is in-line with seasonal variations and rainfall occurrences.

6.2 Flood Risk

The Office of Public Works (OPW) Flood Hazard Mapping website holds a record of historic flood events. A review of this database indicated that there are no records of flooding incidents at the site of the proposed development. OPW's Lee CFRAM Study indicates the extent of fluvial flooding in the River Lee catchment area. No fluvial flooding is indicated in the vicinity of the site. A Site-Specific Flood Risk Assessment for the proposed development was undertaken by MHL and Associates and accompanies this planning application. It has been carried out in accordance with the requirements of "*The Planning System and Flood Risk Management, Guidelines for Planning Authorities*" and its Technical Appendices. It finds that the site is not at risk of flooding nor will the propose development create increased flood risk elsewhere.

6.3 Potential Impacts

The potential impacts on water and hydrology during the construction phase of the proposed development include:

- Surface water runoff during the construction phase may contain increased silt levels (e.g. runoff across areas stripped of topsoil) or become polluted by construction activities. The discharge into nearby water bodies has the potential to cause pollution.
- Discharge of rainwater pumped from excavations may also contain increased silt levels (potential impact on existing hydrology e.g. discharge to existing water drainage infrastructure).
- Accidental spills and leaks associated with storage of oils and fuels, leaks from construction machinery and vehicles, and spillage during refuelling and maintenance.
- Concrete runoff, particularly discharge of wash water from concrete trucks (potential impact on existing hydrology e.g. infiltration to ground).
- Discharge of vehicle wheel wash water (potential impact on existing hydrology e.g. discharge to existing/proposed surface water drainage infrastructure).
- Improper discharge of foul drainage from contractor's compound (impact on existing hydrology e.g. cross-contamination of existing surface water drainage).
- Works associated with the crossing of the existing watercourse as part of the diversion of the 38KV Overhead ESB Line

The potential impacts from the construction phase on surface water is likely to be short term and significant without mitigation measures in place.

The potential impacts during the operational stage of the proposed development include:

- Increased impermeable surface area will reduce local ground water recharge and potentially increase surface water runoff (note, the scheme has been designed to

attenuate to 5 l/s/ha on average which is equal to or less than greenfield run-off rates for each of the specific neighbourhoods).

- Accidental hydrocarbon leaks and subsequent discharge into piped surface water drainage network (e.g. along roads and in driveway areas – likely to be small scale in nature). This is deemed to be an imperceptible temporary adverse impact.
- Increased discharge to foul drainage network (Daily Foul Discharge Volume = 342 cu.m). Irish Water have confirmed that the proposed pump station has been designed to cater for all future flows in the area.
- Increased potable water consumption (Average Daily Domestic Demand = 381 cu.m). Irish Water have confirmed that with the extension of the 250mm HDPE watermain all future potable water requirements are met.
- It is proposed to facilitate existing residential dwellings, on the local road to the north of the site, to tap into the foul sewer network being constructed should they desire once the development is complete. This will see a series of percolation areas being decommissioned / bypassed in favour of a conventional mains service. This would have a positive impact on subsurface ground conditions.

6.4 Mitigation Measures

The following mitigation measures have been identified for the construction phase of the proposed development to mitigate against potential risks to the surrounding hydrological environment:

- The site-specific Construction and Environment Management Plan (CEMP) will be developed by the appointed works contractor and implemented during the construction phase. Site inductions will include reference to the procedures and best practice as outlined in this CEMP. Construction will occur on a phased basis and earthworks management will be carried out by contractors in accordance with best practice to prevent surface and ground water impacts.
- The proposed grounding of the 38KV ESB overhead line and subsequent crossing of the watercourse to the west will be carried out in accordance with ESB Networks requirements and will include directional drilling to avoid impact with the stream. All necessary measures including protective bunds, temporary bridges and silt fences will be provided by the appointed contractor. Inland Fisheries Ireland will be consulted before any of these works are carried out on-site.
- Surface water runoff from areas stripped of topsoil and surface water collected in excavations will be directed to on-site settlement ponds where measures will be implemented to capture and treat sediment laden runoff prior to discharge of surface water at a controlled rate, to the existing watercourse. It is anticipated that a suitably experienced Earthworks Contractor will be appointed to carry out the bulk excavations on the site, with all required measures being put in place to the satisfaction of the Local Authority.
- Weather conditions and typical seasonal weather variations will be accounted for when planning the stripping of topsoil and excavations with an objective of minimising soil erosion and protecting the excavated subsoil and rock for re-use on site.
- All spoil/earthworks storage areas (plans of which are included) will be located on well-vegetated lands and will be surrounded by secure silt fencing. It is proposed to use the lands reserved for the school campus as stock-pile areas, in conjunction

with existing ditches to create the necessary barriers and sediment ponds to ensure silt run-off is fully controlled.

- If de-watering of earthworks materials is required the resulting water will be pumped out onto well-vegetated areas away from springs, drains or rock outcrops and allowed to run-off into formed settlement ponds prior to discharge to the main drainage system.
- In order to mitigate against spillages contaminating the surrounding surface water and hydrogeological environments, all oils, fuels, paints, and other chemicals will be stored in secure bunded hardstand areas. Refuelling and servicing of construction machinery will take place in a designated hardstand area which is also remote from any surface water inlets or outlets (where not possible to carry out such activities off site). Any hardstand areas will be isolated from main drainage runs and will include petrol interceptors prior to discharge.
- Concrete batching will take place off site and wash down and wash out of concrete trucks will take place off site (at authorised concrete batching plant in full compliance with relevant planning and environmental consents).
- Discharge from any vehicle wheel wash areas will be directed to on-site settlement ponds and will pass through a hydrocarbon interceptor prior to discharge.
- The construction compound will include adequate staff welfare facilities including foul drainage and potable water supply. Foul drainage discharge from the construction compound will be tankered off-site to a licensed facility if necessary, until a connection to the public foul drainage network has been established.
- The construction compound's potable water supply will be protected from contamination by any construction activities or materials in the instance that a temporary well has to be sunk.
- Spill Kits to be kept in designated areas.

The following mitigation measures are proposed for the operational stage of the proposed development:

- The proposed road gradients, road levels, and dwelling finished floor levels (FFL) have been designed to ensure the concentration of surface water run-off in any one location is avoided.
- Each drainage area has been assessed independently of others in terms of allowable run-off rates. SuDS measures are proposed for each neighbourhood, which have not been included for in the sizing of the storm sewer network, reducing the discharge rate to below greenfield run-off rates (QBar). These proposed interception measures will ensure that the initial 5mm of rainfall is prevented from discharging to the storm network, thereby ensuring the water quality of the receiving watercourse to the west is preserved.
- Surface water runoff on the western side of the site will be attenuated to greenfield runoff rates (Qbar) as agreed with the Drainage Department of Cork City Council.
- SuDS measures in this location will include the use of permeable paving at traffic calmed junctions and the use of planted swales where possible along road edges to provide a primary cleaning of run-off before entering the storm network. Measures

will also include soakpits in rear gardens in parts of the development and water butts for each unit.

- Surface water discharge rates will be controlled by a Hydrobrake type vortex control device or similar approved, in conjunction with below ground Stormtech attenuation chamber storage, or similar approved.
- Surface water runoff to the eastern side of the site will be routed to buried Stormtech chambers for infiltration into the existing subsoil in-line with site investigation results. This will facilitate the recharge of aquifers in the area whilst limiting the run-off from the overall site to less than the current rate.
- A contract will be entered into with a suitably qualified contractor for the maintenance of the attenuation system including Hydro-brake and the installed hydrocarbon interceptors.
- The proposed pumping stations can provide for back-up generators and in the case of the Ballyhooly Road pumping station accommodate connection to the pre-existing network in the case of an operational failure.

The proposed Sustainable Urban Drainage Strategy for the site includes the following:

- The use of on-site infiltration where feasible (eastern side of the scheme).
- Permeable paving at suitable locations in and around the retail/crèche area.
- Permeable paving to be used for junction treatments and tied into storm sewer network in all locations.
- Planted swales along access roads where practical (including tree-pits).
- Attenuation chambers sized to 30 and 100 year return period storms.
- Installation of Hydrobrake vortex control system (limiting surface water discharge from the site to Q_{bar} (5 l/s/ha)).
- Fuel/oil separators will be sized and installed in accordance with permitted discharge from the site for the various phases.
- Attenuation storage design allows for 20% growth of rainfall intensity due to climate change.
- Green roof attenuation storage provided for in apartments in neighbourhood 6.

6.5 Predicted Impact

The implementation of the mitigation measures outlined for the construction stage of the proposed development will ensure that the potential impacts on water and the hydrological environment do not occur. There are no predicted residual impacts on water and hydrology once the proposed development is operational. The use of on-site infiltration will ensure that the recharge of underlying aquifers continues to occur. It is also noted that seepage rates from areas of cut have been included in the design of the storm sewer network and will be attenuated prior to discharge to the watercourse. A maintenance contract will be entered into with a suitably qualified contractor for the on-going maintenance and silt removal for all attenuation tank systems on-site.

7.0 Air Quality and Climate

Chapter 7 of the EIAR provides an assessment of the likely impact on air quality and climate associated with the proposed development. This chapter assesses the microclimate and macroclimate impacts of the proposed development.

7.1 Receiving Environment

The most recent annual EPA air quality monitoring reports and data show that CO concentrations in Ireland are expected to stay low for the foreseeable future, and that benzene concentrations have been low and stable for the last number of years and are anticipated to stay low in the medium term. However, the monitoring data indicates that while NO₂ concentrations are low in rural areas, higher levels in urban areas continue to pose a threat to compliance with the limit value. Furthermore, PM₁₀ and PM_{2.5} also have the potential to exceed the limit values in urban areas. The impact of the proposed development on NO₂, PM₁₀ and PM_{2.5} is therefore the focus of this air quality assessment.

The assessment focused firstly on identifying the existing baseline levels of NO₂, PM₁₀ and PM_{2.5} in the region of the proposed development, both currently (by analysis of existing EPA monitoring data), and for the opening and design years of the development (through modelling). Ambient concentrations of NO₂, PM₁₀ and PM_{2.5} for the opening year (2029) were then predicted at worst-case sensitive receptors close to the development for both the “do nothing” and “do something” scenarios. The impact of the development on air quality at the sensitive receptors was determined through a comparison of the predicted “do something” ambient concentrations with the relevant air quality limit values / target values. In addition, the significance of the impact on air quality was assessed through comparison of the predicted “do nothing” and “do something” pollutant concentrations in 2029.

The potential impact of the proposed development on microclimate was considered in relation to the existing local weather conditions and the size and nature of the development.

A short-term air quality monitoring study was conducted in the region of the proposed development in order to determine the effect of local road traffic sources. It is noted that EU Member States are required under EU air quality legislation to designate zones for the assessment and management of air quality. The trend in NO₂ concentrations measured in Cork City Centre over the past number of years shows that levels approached the limit value of 40 µg/m³ over the period 2008 - 2010 peaking at 34 µg/m³. However, levels decreased to 23 µg/m³ from 2010 to 2013 which was consistent with a general downward trend in concentrations throughout the country. More recently, there is a downward trend in the annual average concentration at a new city centre location over the period 2014-2018). The most recent reported annual average NO₂ concentration (at South Link Road) was 25 µg/m³, or 63% of the annual limit value.

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7.2 Potential Impacts

7.2.1 Air Quality

The dominant source of air pollutant emissions resulting from the proposed development will be from road traffic and the air quality impact resulting from additional road traffic emissions as a result of the development has been modelled. An assessment of the effect of changing the traffic speed (for the entire assessment year) from the higher speeds of 30 km/hr to a worst-case congestion speed of 10 km/hr has also been carried out for all pollutants. The results show that in summary, the proposed development will lead to an insignificant increase in pollutant levels.

7.2.2 Climate

It is noted that the construction of the proposed development will lead to changes in the existing local terrain, which may slightly alter wind flow patterns and localised temperatures. However, these changes are unlikely to impact on local meteorological conditions. Thus, due to the size and the nature of the proposed development the impact on microclimate during construction and operation will be negligible.

With regard to macroclimate, the dominant source of CO₂ emissions resulting from the proposed development during operation will be from road traffic. During the construction phase, there will be additional CO₂ emissions resulting from the construction activities and the embodied CO₂ in the construction materials. The modelling results show that the impact of the increased road traffic CO₂ emissions on the macroclimate will be negligible.

7.3 Mitigation Measures

7.3.1 Air Quality

With regard to mitigating impacts on air quality and climate, during the construction phase a dust management plan will be implemented setting out mitigation measures to be put in place during the construction phase of the proposed development. The dust management plan and control measures in place should be reviewed at regular intervals during the construction phase to ensure the effectiveness of the control measures and to improve these measures where needed.

Once operational, mitigation measures in relation to traffic-derived pollutants are managed at a strategic level by EU legislation on vehicle emissions and fuel quality. The results of the dispersion modelling assessment show that there are no requirements for local management of air quality during the operation phase of the development.

7.3.2 Climate

The embodied CO₂ in construction can be reduced at project specification / procurement through leaner design, designing out waste, reusing materials, and selecting materials with lower embodied carbon over the project life-cycle.

Once operational, the policy and legislative measures in place in Ireland with regard to reducing national greenhouse gas emissions will lead to a reduction in CO₂ emissions from road traffic.

8.0 Noise and Vibration

Chapter 8 of the EIAR provides an assessment of the likely noise and vibration impacts associated with the proposed development. In consideration of any new development, 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. In order to take a prudent approach for assessing the noise and vibration impact from the development, the assessment considered the operational aspect of

the entire development at the end of construction completion only (i.e. the end of Phase 6). The reason for taking this approach is that it not only considers the 'worst-case' operational condition for the development but also the permanently operating condition going forward.

The evaluation of the 'worst-case' condition of the entire development in operation will need to be the basis for determining the appropriate mitigation measures that would be required. Individual consideration of each phase therefore becomes superfluous because the noise and vibration impact of each of the phases would only represent partial contributions from the development. It could also be misleading as individual consideration of each phase could indicate that no mitigation measures would be required whereas consideration of all phases in totality could indicate that they are. Consideration of the construction phase, however, is conducted on an individual phasing basis given that construction works are a temporary noise and vibration source that will only be present at discreet locations during each of the specific phases.

The development noise emissions during the construction phase will mostly be due to site clearance, landscaping and the construction of the various residential dwellings and other site buildings. Development noise emissions during the operational phase of the project are expected to be from seven primary sources as follows:

- Activity noise from crèche;
- Delivery truck events;
- Building services plant;
- Pumping station emissions;
- Development car parking;
- Vehicular traffic on the development's new internal roads; and
- Additional vehicular traffic on surrounding public roads.

8.1 Receiving Environment

An environmental noise survey was conducted in order to quantify the existing baseline noise environment. Noise measurements were conducted over the course of two survey periods as follows:

- Daytime 12:35 to 15:25hrs 6 July 2017;
- Night-time 23:05 to 02:00hrs 6/7 July 2017.

8.2 Potential Impacts

8.2.1 Construction Phase

All of the predicted construction noise emission levels at the Brookwood Estate residences are well below the criterion of 65dB $L_{Aeq,1hr}$ for construction activities during a weekday. There should therefore be no disturbance caused to dwellings in the vicinity of this estate. The predicted noise levels at the existing dwellings to the north of the site for Phases 1, 3, 5 & 6 are also well below the criterion of 65dB $L_{Aeq,1hr}$ for construction activities during a weekday. There should therefore be no disturbance caused to dwellings in this area for these phases. The only predicted exceedances were during the Site Works phase and for Phases 2 & 4. However, these exceedances only occur at a handful of noise sensitive locations in this area.

It should be highlighted that any potential construction noise emission exceedance that may occur at these identified locations will be relatively both temporary and short term in nature. The exceedances are due entirely to the close proximity of some of the development buildings and are therefore only likely to occur during construction of the nearest building(s) and not the entire phase (particularly during the site works phase when it will likely be limited to a few days at each). It is noted that the area is zone for development.

With respect to vibration impact, the potential for vibration at neighbouring sensitive locations during construction is typically limited to excavation works and lorry movements on uneven road surfaces (we note that there is no blasting envisaged in the site preparation for the development). The more significant of these is the vibration from excavation operations; the method of which will need to be selected and controlled to ensure there is no likelihood of structural or even cosmetic damage to existing neighbouring dwellings. However, the relative distance between the excavation areas and the existing residences is such that any ground borne vibration should be well below threshold limits.

8.2.2 Operational Stage

As noted above, a number of potential noise sources for the operational stage were assessed. The total level of combined noise emissions from the proposed development noise sources was then determined by summing together all of the individual contributions. As noted in Chapter 8 the predicted cumulative noise levels considered an extreme 'worst-case' scenario. The results show that the expected levels of noise emissions from the proposed development are well within the established daytime criteria at all nearby noise sensitive receptors. It should also be noted that the predicted daytime noise levels are also less than the established night time criteria of 45dB $L_{Aeq,16hr}$ at all nearby noise sensitive locations. There is therefore no significant noise impact that is expected from the proposed development on any of the identified nearby noise sensitive receptors.

8.3 Mitigation Measures

The scheme contractor will be obliged to give due regard to *Code of Practice BS 5228: Noise Control on Construction and Open Sites*, which offers detailed guidance on the control of noise from construction activities. In particular, it is proposed that various practices be adopted during construction, including:

- Limiting the hours during which site activities likely to create high levels of noise are permitted.
- Establishing channels of communication between the contractor/developer, local authority and residents.
- Appointing a site representative responsible for matters relating to noise.
- Ensuring all site access roads are kept as even as possible so as to mitigate the potential for vibration from lorries.
- Monitoring typical levels of noise during critical periods and at sensitive locations (at houses along the road to the north only)
- Provision of site hoarding for screening purposes.

Furthermore, it is envisaged that a variety of additional and practicable noise control measures will be employed, including:

- Selection of plant with low inherent potential for generation of noise.

- Siting of noisy plant as far away from sensitive properties as permitted by site constraints.
- All compressors shall be “sound reduced” models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use.
- All ancillary pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers, and where commercially available, dampened tools and accessories shall be used.
- Blasting will only be permitted in agreement with Cork City Council. As outlined in the preliminary site investigation report rock encountered on-site is ‘rippable’ so blasting is not anticipated at this stage.

The noise impact assessment has demonstrated that no additional noise mitigation measures will be required in respect of activity noise from the crèche, in respect of noise from new internal roads and development car parking or in respect of additional vehicular traffic on public roads.

The noise impact assessment has confirmed that the following additional mitigation measure should be applied in relation to delivery truck events to the proposed development:

Mitigation Measure 8.1:

Retail unit delivery truck events should be restricted to daytime periods only.

The noise impact assessment has confirmed that the following additional mitigation measure should be applied in relation to pumping station emissions:

Mitigation Measure 8.2:

Emergency generators shall be selected and/or designed such that they do not emit noise levels of more than 70dB L_{Aeq} at a distance of 1m from the pumping station buildings.

Mitigation Measure 8.3:

Restriction of emergency generator testing times to maximum half hour periods during weekday daytime periods only.

The noise impact assessment has confirmed that the following additional mitigation measures should be provided in relation to building services plant:

Mitigation Measure 8.4:

Selected building services plant shall have a noise level no louder than 75dB L_{Aeq} at a distance of 1m from the unit or building façade (or have noise control measures incorporated to achieve the same).

Mitigation Measure 8.5:

A barrier wall should be provided to screen any noise producing mechanical equipment provided on the roof (or if provided at ground level) with direct line-of-sight with the dwellings to the north.

As noted in Chapter 8 the provision of the delivery truck, pumping station and building services mitigation measures detailed above will ensure that the proposed development's cumulative residual noise levels are achieved. These levels are within the criteria limits established in the assessment and would therefore be considered insignificant. The noise impact generated by additional traffic movements associated with the development is predicted to be of an imperceptible impact on existing ambient noise levels at receptors along the local road network.

Impacts from all other noise sources associated with the development have been confirmed as being insignificant. No significant residual noise or vibration impact from the developments operational phase is therefore expected at any of the noise sensitive locations in the vicinity of the development.

9.0 Material Assets

Chapter 9A of the EIAR considers the impact of the proposed development on services, utilities and waste.

9.1 Receiving Environment

In terms of storm water drainage, the existing greenfield site, the subject of this application, slopes from east to west, draining towards the watercourse on the western side of Ballyhooly Road. A number of land drain connections provide a direct connection from the lands to this watercourse. Existing storm water run-off from the R614 (Ballyhooly Road) as it passes the site enters the watercourse by way of open drainage cuts through the existing ditch. This serves as an outfall for surface water falling on the public road and new housing to the north (Dublin Pike). There is an existing 225mm diameter foul sewer running north to south along the Ballyhooly Road. This sewer links to the foul sewer serving Brookwood Housing Estate south of the Kilbarry Link Road.

It is proposed to connect the sites water supply to an existing pipeline present in the Dublin Hill area approximately 780m to the west of the site boundary. The extension of this watermain has been agreed with Irish Water and will comprise a 250mm HDPE watermain. As advised by Irish Water, there is presently sufficient capacity in the IW water network to supply the proposed development.

There are a number of existing ESB transmission lines crossing the Ballyvolane Urban Expansion Area lands. There are two 110Kv lines namely the Kilbarry to Knockraha no.1 line and no. 2 line. There are also a couple of 38Kv lines. Two overhead power lines traverse the planning application site, a 110Kv line from north west to south east over 4 pylons and a smaller 38Kv line runs east to west along the southern part of the site.

The site is located in an area where commercial operators are delivering or have indicated plans to deliver high speed broadband services. Operators are continuing to enhance their services in these areas to improve access to high speed broadband. It is indicated that Eir Fibre Broadband is live in the area with live Eir cabinets located in close proximity to the site on the Ballyhooly Road.

There is existing public lighting serving the Kilbarry Link Road over its extents and on Ballyhooly Road to the end of the Mervue Lawn Residential Estate. On Ballyhooly Road this coincides with the extent of footpath provision.

In terms of waste management, there are a significant number of waste contractors operating in the Cork area who are permitted to collect waste and already service houses

and businesses in the Ballyvolane area. Examples of contractors include DMC Waste and Recycling, Country Clean Recycling Ltd, Kollect, Wiser Bins, Healys Blue Bin and Greenstar.

9.2 Storm Water Drainage

A combination of infiltration to the east and stormwater attenuation to the west of the site is proposed to drain the development. For this development, the following SUDS measures are proposed:

- Planted swales running adjacent to roadways where feasible.
- Kilsaran permeable paving at suitable locations throughout the site
- Storm-tech attenuation chambers in conjunction with Hydroflow vortex control to maintain a maximum outflow of 5 l/s/ha (Avg Qbar).
- Infiltration soakaways on the eastern portion of the development where the topography is flatter and infiltration tests were conducive to infiltration.

It is proposed to connect the main surface water discharge to the local network at a location 0.8km south on Ballyhooly Road, Outfall 2. Neighbourhood 4 (Phase 4) will connect at Outfall 1, and will be used to recharge the existing stream during low flow periods.

Potential impacts on surface water during the construction period of the proposed development have been identified. These relate to pollution of surface water due to increased silt levels in runoff and accidental spills and leaks and cross contamination due to improper discharge of foul drainage. Works associated with the crossing of the existing watercourse as part of the diversion of the 38KV overhead ESB line have also been identified.

Once operational the potential impacts on surface water are increased impermeable surface area will reduce local ground water recharge and potentially increase surface water runoff (note, the scheme has been designed to attenuate to 5 l/s/ha on average which is equal to or less than greenfield run-off rates for each of the specific neighbourhoods) and accidental hydrocarbon leaks and subsequent discharge into piped surface water drainage network (e.g. along roads and in driveway areas – likely to be small scale in nature). This is deemed to be an imperceptible temporary adverse impact.

The Water and Hydrology Chapter contains further detail with regard to the surface water strategy. An assessment of the impacts considering the proposed mitigation measures set out concludes that all of the potential impacts both during the construction and operational stages of the proposed development are considered to be of neutral significance and impact and will not result in any residual impacts on surface water.

9.3 Foul Water Drainage

The construction stage of the proposed development will involve the construction of new foul sewers and will require the construction of a gravity sewer network, a pumping station and a rising main to pump the discharge to the existing Irish Water wastewater network to the south east of the site.

There is a potential risk of short-term impacts when connecting to existing manholes. There is a risk of pollution of groundwater by accidental spillage of foul effluent during connections. However once best practice construction practices are adhered and Irish Water procedures followed the impact on foul drainage during the construction stage will be minimised and no long term impacts will result from the construction stage.

The operational stage of the proposed development will result in increased effluent volumes to the foul network. Irish Water have confirmed that the existing foul sewer in the area has the capacity to accommodate the initial phase of the development and that future phases of the development will require the construction of a gravity sewer network, a pumping station and a rising main to pump the discharge to the existing Irish Water wastewater network to the south east of the site.

The Applicant has entered into a Project Works Services Agreement (PWSA) with Irish Water. This PWSA makes provision of land for a pumping station and Irish Water has committed to carrying out network improvements. This will address any foul water constraints that existed in the Lahardane area for Phase One development, as defined under the Urban Expansion Area (0-1175 Houses), and will allow for the Ballyvolane greater area to be opened up. Provision will be made for all properties along the northern boundary of the site to connect to the proposed foul water sewerage network.

The impact of the proposed development on foul water drainage is likely to be long term and imperceptible.

9.4 Water Supply

The water supply for the proposed development will be taken from a 250mm watermain which will be extended from Upper Dublin Hill by Irish Water. The proposed water main network is shown on the MHL and Associates Ltd drawings accompanying this planning application. During the construction of the water main network, there is likely to be short term (temporary) disruption to local water supply service. However, this will be temporary to facilitate connections to the network. All such temporary shutdowns will be agreed with Irish Water in accordance with the appropriate procedures and people that will be affected will be advised in advance of the short-term impacts that they may experience. There is a potential risk of contamination to the existing water supply during the construction phase when the development is being connected to the water supply.

The impact on water supply during the operational stage of the proposed development is an increase in the quantity of water to be treated and supplied through the network. Irish Water have confirmed that there is sufficient capacity in the Irish Water network to supply the proposed development. In order to facilitate the connection of the proposed development the network will be extended. All plumbing fixtures and fittings to be installed within the development should be to the current best practice for water consumption to minimise future water usage. The potential impact on water supply once operational is likely to be long term and imperceptible. Provision will be made for all properties along the northern boundary of the site to connect to the water supply as extended.

9.5 Power Supply

Potential impacts on power supply during the construction stage of the proposed development would be short term power outages. All power supply related works will be carried out in accordance with ESB Networks relevant guidelines and procedures. The proposed development provides for the undergrounding of an existing 38Kv overhead ESB Networks line which will involve crossing of the water stream to the west of the site on the opposite side of the Ballyhooly Road. The works required in the undergrounding of the 38Kv line could, in the absence of suitable mitigation, result in contamination of the stream. It is noted that undergrounding of the 38KV ESB overhead line and the subsequent crossing of the watercourse to the west will be carried out in accordance with ESB Networks requirements and will include directional drilling to avoid impact with the stream. All necessary measures including protective bunds, temporary bridges and silt fences will be

provided by the appointed contractor. Inland Fisheries Ireland will be consulted before any of these works are carried out on-site

The impact of the operational stage is that an Electrical Diversified Load of approximately 2.7MW is required which will be split over up to 5 no. Unit Sub Stations spread throughout the site. The 110Kv power line running through the site is being retained and it is proposed to incorporate it into the greenway to achieve the 25 metre buffer that is required at either side of the 110Kv line. The potential adverse impact of the proposed development on power supply is likely to be long term and minimal.

9.6 Telecommunications

There may be potential temporary loss of connection or interruption to the telecommunications infrastructure in the area when connection to the proposed development is being provided. The impact on telecommunications during the construction stage is likely to be short term and minimal. The impact of the proposed development on the telecommunications network would be to increase the demand on the existing network. The proposed impact is likely to be long term and minimal.

9.7 Public Lighting

During the construction stage, the development site will require lighting. The lighting system will be designed to minimise light spillage by using shielded, downward directed lighting wherever possible. The proposed lighting for the development has been prepared by MHL and Associates Ltd. The proposed street lighting has been designed to EN 13201 and British Standard BS 5489.

9.8 Waste Management

The proposed development will generate a range of waste types during the excavation and construction stage. The impact of waste on the construction stage are considered to be short term and will not have a significant effect on municipal waste services. As noted in the CEMP prepared by MHL and Associates It is anticipated that a significant amount of material arising from the works will be classified for re-use as fill material under roads and pavements. The objective is to ensure the absolute minimum amount of material leaves the site as waste.

Given the nature of the proposed Project i.e. a large residential development including a local centre, a number of different waste materials will be generated once the development is operational. As an established area within Cork City, there are a number of waste disposal contractors serving this area.

It is noted that all possible measures shall be taken to avoid unplanned disruptions to any services and utilities within the site area during the construction of the proposed development. Provided that the mitigation measures are adhered too there is unlikely to be any adverse impacts on material assets during the construction stage and any residual impacts on the existing foul and waste systems would be temporary and minor.

Provided the mitigation measures proposed are implemented, the residual impacts on the foul and water systems during the operational stage are long term and imperceptible.

No significant impacts from either the construction or operational stages of the development are likely, as a consequence of the connection to the power and telecommunications networks.

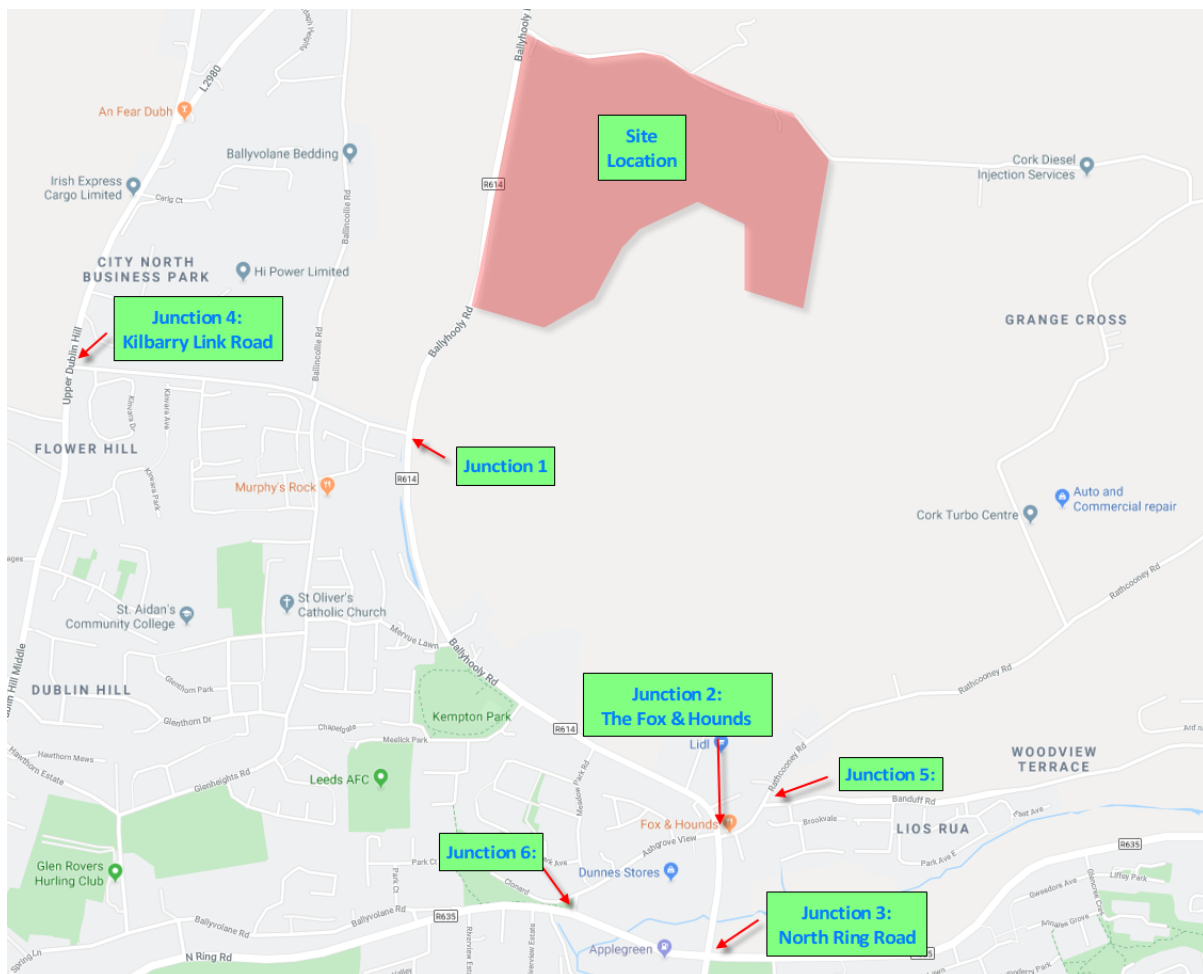
Chapter 9B of the EIAR details the Traffic and Transport Assessment (TTA) of the proposed development. The Traffic and Transport Assessment was prepared based on Transport Infrastructure Irelands traffic and Transportation Assessment Guidelines 2014. The scope of the TTA was agreed with Cork City Councils Traffic and Transportation Department. This chapter assesses how the proposed development will impact the surrounding roads network. It considers appropriate access arrangements and the transport choices available to future users of the application site and how the existing/proposed transport infrastructure surrounding the site will influence that choice.

The assessment was developed using data from commissioned traffic counts. A total of 15 turning count surveys were undertaken as part of the study on Thursday 11th April 2019. These surveys were carried out simultaneously using video cameras at each of the junctions for a 12-hour period. Queue length surveys were carried out at the identified critical junctions (Figure 9.1 Below) for the peak hour periods to be modelled, 08:00-09:00 and 17:00-18:00.

On-site measurements including lane widths, junction turning radii, lane lengths and saturation flows were undertaken by MHL and Associates at various times in the intervening months. Further site-specific queue length, pedestrian crossing frequency and traffic signal timing surveys were undertaken as part of the calibration of the constructed models. These surveys were carried out when school and college traffic had resumed after the summer period. The key junctions in the area surrounding the proposed development are identified as follows:

- Junction 1. Kilbarry Link Road / Ballyhooly Road
- Junction 2. The Fox & Hounds Junction
- Junction 3. North Ring Road / Ballyhooly Road
- Junction 4. Kilbarry Link Road / Upper Dublin Hill
- Junction 5. Banduff Road / Rathcooney Road
- Junction 6. North Ring Road / Clonard Road

Figure 9.1 Junction Locations



The closest public bus route serving the site is the 207, the terminus of which is approximately 300m from the site entrance (5mins walk). Route 207 runs from Ballyvolane to Donnybrook via Cork City centre with terminus at Glenheights Park, Glenheights Road in Ballyvolane on the North of the City and at Scairt Cross, Donnybrook on the South side.

As part of the Ballyvolane Strategic Transport Corridor (BSTC) significant improvements to Route 207 are proposed with the aim of decreasing journey times and enhancing public facilities. These include bus shelters and RTPi (Realtime Public Information) boards to be provided at bus stops along the corridor and bus priority at all signal-controlled junctions. With the provision of these facilities and other incentives as part of national policy, it is anticipated that a shift to public transport will occur over the construction phase of the proposed development. The Cork Metropolitan Area Transport Strategy (CMATS) has provided more certainty for the delivery of these enhancements.

In the proposed development an off-road bus stop is proposed on the R614 adjacent to the newly signalised R614/Kilbarry Link Road Junction. The proposed development is to include the provision of off-road bus stops on the main distributor road within the development, as well as a temporary turning areas to facilitate the provision of a re-routed service prior to the completion of the overall roads network proposed as part of the urban expansion area zoning.

junctions on this route (The Northern Corridors Study) which provided proposed junction upgrades to prioritise public transport and to reduce journey times to the city centre. Future year modelling as set out in the TTA has included the delivery of junction upgrade works as outlined in the original study. This is based on the assumption that the previously identified works will be provided as a minimum as part of the new scheme. Part VIII approval has already been issued for the upgrade of the Ballyhooly Rd North Ring Road junction upgrade.

In assessing the impact of the proposed development on traffic and transport it is considered that the surrounding road network is suitable to accommodate the construction traffic associated with the proposed development and that the Construction Traffic Management Plan will include a range of mitigating measures as identified in the CEMP to ensure the safety of the workforce on the site and accessing the site, and the public on the surrounding roads and to minimise construction traffic generation and disruption on the surrounding road network.

In terms of the impacts on traffic and transport, once the proposed development is operational, traffic generation from the development is based on recorded traffic generation from an existing residential development, 'Meadow Park', which has a direct vehicular access onto the Ballyhooly Road. The Meadow Park Residential Development comprises 212 semi-detached units with parking provision for two vehicles per unit. This unit mix is conservative in terms of the proposed Longview Estate Development, as is the car parking provision and hence its use will ensure a robust assessment of traffic impact from the proposed scheme will occur.

Following discussions with the Cork City Council Transportation Department it was suggested that a location in Dublin, that would have a similar population mix in terms of employment and house ownership, but with an improved sustainable transport network (including cycle facilities and dedicated public transport corridors) could be used to derive future modal shift targets that would reflect committed NTA upgrade works currently being undertaken by Cork City Council on the Ballyhooly Transport Corridor Scheme (BTCS). The Blanchardstown area of Dublin was identified as having similar characteristics to the study area. A breakdown of the data shows up to 45% of people in this area use sustainable transport options at present.

On completion of the Ballyhooly Transport Corridor works, scheduled for the first quarter of 2023, an increase in modal shift of 33% would be expected to be delivered for the area. This increase in modal shift has not been applied to existing traffic numbers when developing future year traffic models but was used in developing traffic generation from the site. In-line with the 2016 Census Data the existing modal shift rate of 12% has been assumed to remain stagnant up to the end of 2021. Thereafter, with the completion of the Ballyhooly Strategic Transport Corridor Scheme, this modal shift rate is expected to increase with the aim of achieving a rate of 45% (2016 rate for Blanchardstown-Coolmine in Dublin) by the end of 2025.

To determine the traffic generation from the proposed development, the trip generation rates incorporated the expected percentage increase in modal shift for future years. This traffic has been added to the existing background flows and distributed through the network to model each of the identified junctions.

In summary the TTA has demonstrated the following:

(i) The proposed residential development is in accordance with the Local Area Plan and forms an important first part in the delivery of planned growth in the area.

(ii) A review of the existing roads network and collision data in the vicinity of the site indicates that there are no significant problems in relation to the current operation or safety of the identified junctions. Existing traffic congestion on the R635 North Ring Road during peak periods has already been reduced as a result of Phase I of the BSTC project being implemented. The future year traffic modelling carried out as part of this assessment demonstrates that with further junction improvements proposed as part of the next phase of public works, additional capacity at junctions is generated.

(iii) The proposed site layout is permeable to the roads network and is connected to existing pedestrian linkages to public transport offerings, schools, retail and amenity destinations.

(iv) The proposed new access arrangements are safe and suitable and are in accordance with the Design Manual for Roads & Bridges (DMRB) and the Design Manual for Urban Roads & Streets (DMURS).

(v) The site benefits from being in close proximity to regular transport provision, within walking distance of the site, which enables journeys throughout Cork City.

(vi) Junction mitigation measures proposed as part of this application include the signalisation of Junction 1: Ballyhooly Road/Kilbarry Link Road incorporating a toucan crossing to facilitate pedestrian/cycle connectivity to local bus stops, schools, church, sports grounds (soccer and GAA) and existing residential areas. The traffic modelling of this junction using LinSig software has demonstrated that the junction operates with spare capacity up to and including the completion of the development in 2029. The junction has been assessed to include for a pedestrian phase each and every cycle. The safety implication of this proposal is positive as the junction and its approaches will be traffic calmed and in addition the signalisation will regularise traffic flow entering the urban environment.

(vii) As part of the development proposal the inclusion of an off-road cycle and pedestrian facility from the development entrance to a proposed crossing of the Ballyhooly Road at Mervue Lawn, south of the site, is to be delivered. This will facilitate and encourage modal shift towards more sustainable modes of travel.

(viii) The cumulative impact of the development, inclusive of future growth background traffic and with proposed junction upgrades to be delivered as part of the BSTC project being in place from 2023 onwards, has been tested on the identified critical junctions, indicating that the proposed development can be accommodated without the need for alternative routes (for example the Northern Orbital Route) as outlined in CMATS, being in place.

(ix) The completion of the aforementioned Northern Orbital Route (NOR), which will link from 'Tinker's Cross' (Junction of the R635 & North Ring Road) on the R635, North Ring Road, to the N20 will provide an alternative route for traffic currently using the R635 to bypass the city centre. This route is indicated to pass to the south of the development site, incorporating the 'Kilbarry Link Road' and will serve as a high-quality bus corridor (QBC) orbiting the city. Arterial links to the city centre, such as the Ballyvolane Strategic Transport Corridor, will provide connectivity inwards from this route. The NOR is identified in CMATS (Cork Metropolitan Area Transport Study) with an expected delivery date by 2031. On its completion traffic and travel patterns in this area will undergo significant change which has been included in the SWRM (NTA South West Regional Model) future year scenarios. Consequently, this TTA does not look beyond a 2029 Design Year.

(x) The proposed development is to be accessed via two priority junctions onto the R614 Ballyhooly Road as shown in the following Figure. These junctions have been assessed for development traffic and background traffic flows on the Ballyhooly Road and found to operate within capacity up to and beyond the design year.

The TTA concludes that the proposed development, in traffic and transportation terms is acceptable, and there are no traffic and transportation reasons that should prevent the Planning Authority from recommending approval of this application.

10.0 Biodiversity

Chapter 10 of the EIAR assesses the likely significant effects on biodiversity (flora and fauna) arising out of the proposed development. Measures to mitigate the potential impacts on defined ecological features are proposed. The assessment involved a desk study and field surveys by a suitably qualified ecologist. The methodologies used to determine the value of ecological receptors, to characterise the potential impacts of the proposed development and to assess the significance of impacts and any residual effects, are in accordance with the NRA (now TII) (2009) *Guidelines for Assessment of Ecological Impacts of National Road Schemes* and the CIEEM (2018) *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Coastal, Freshwater and Marine*. Ecological features are valued as being of Local Importance (Higher Value) as per the criteria set out in the NRA (2009) guidelines.

A Natura Impact Statement (NIS) has been prepared and is included as a standalone report with the planning application. The NIS concluded that, with the implementation of best practice and the recommended mitigation measures, there will be no potential for direct, indirect or cumulative impacts arising from the proposed residential development, either alone or in combination with any other plans or projects. No reasonable scientific doubt remains as to the absence of such adverse effects.

The proposed site predominantly comprises arable fields bound by hedgerows and treelines. The fields across the site support narrow grassy and relatively species poor field margins and small pockets of species poor wet grassland and scrub have developed around two field drains to the west of the site. These habitats are of Local Importance (Lower Value). The majority of the hedgerows bounding the fields are species poor with many gaps. The treeline bounding the west of the site adjacent to Ballyhooly Road is more substantial and is comprised of native tree species. The hedgerows and treelines provide connectivity in the landscape and habitat for birds and mammals and are considered to be of Local Importance (Higher Value). There are no watercourses or waterbodies within the proposed site.

No features of significance for roosting bats are present within the proposed site, however bats do commute to the site to forage. No evidence of badger setts was recorded within the proposed site. Badger droppings were present to the east of the site, indicating that this area is part of a badger territory. The treelines and more substantial areas of hedgerow provide habitat for breeding birds. Three species of moderate conservation concern and one species of high conservation concern were recorded at the site. Badger, bats and birds are of Local Importance (Higher Value) as they occur at the proposed site and are considered to be ecological features. The habitats at the proposed site are not suitable to support other protected species of fauna.

The proposed development will involve the loss of arable fields, most of the internal hedgerows and the treeline at the west of the site. In the absence of mitigation, the loss of the hedgerows and treelines represents a significant impact at the local level.

No impacts will occur to roosting bats. There is potential for the loss of hedgerows and treelines and use of lighting to impact on commuting and foraging bats. In the absence of mitigation, this would be a significant impact at the local level. No badger setts were recorded at the site, as such, there will be no direct impacts to badgers. However, badgers create new setts regularly, and the site provides suitable habitat for sett excavation in earth banks associated with hedgerows/ treelines at the site. Direct impacts on badgers may occur should badgers establish setts in hedge banks adjacent to areas of construction. This would be a significant impact at the local level. The proposed development may reduce the foraging area of badgers, however, in view of the small area of the site utilised by badgers and the abundance of available habitat in the wider landscape, this is not expected to have a significant impact on the local badger population. The loss of hedgerows, tree lines and arable fields may impact on nesting birds and will result in a reduction in foraging area for yellowhammer. In the absence of mitigation, this would be a significant impact at the local level.

All construction works will proceed in line with current best practice guidelines and the requirements of the Construction and Environmental Management Plan for the residential development.

In order to compensate for the loss of hedgerows and treelines, significant new planting has been incorporated into the landscape design for the proposed development. This planting predominantly comprises native species, with some non-native species included as street trees and specimen trees. The landscape design ensures that habitat connectivity in the wider area is maintained and includes planting of tree species that are of value to pollinators. The open space in the wayleave also includes a wildflower meadow, which incorporates several ornamental species of value to pollinators.

The landscaping plans mitigate the loss of foraging and commuting habitat for bats. To minimise disturbance to bats and other fauna that are active at night, construction lighting will be directed away from all hedgerows and treelines to be retained. The proposed landscaping plan and the lighting plan provide darker areas within the site and potential foraging areas for bats. A pre-construction survey shall be undertaken prior to the commencement of construction to identify active badger setts occurring within the site. In the event that badger setts are identified within proximity to the proposed works area, the mitigation measures provided in NRA (2005) will be fully implemented. No hedgerow clearance or tree felling will occur during the bird breeding season from 1st March to 31st August. The landscaping proposals will mitigate for the loss of habitat utilised by birds for foraging and shelter. The landscaping plan also includes for the installation of bird boxes in the wayleave area.

The proposed development will result in a permanent reduction in the available foraging area for yellowhammer. However, in view of the extensive arable and pasture farmland habitat available in the surrounding landscape and the landscaping incorporated into the project design, the residual impact on the local yellowhammer population is not expected to be significant. Overall, no significant residual impact on biodiversity are expected as a result of the proposed development.

11.0 Cultural Heritage

Chapter 11 of the EIAR is an assessment of the impacts of the proposed development on the recorded and potential cultural heritage resource (including folklore, tradition, architectural heritage and archaeological sites) and identifies appropriate mitigation measures. The

assessment identifies the recorded and potential cultural heritage resource within the proposed development site and a study area extending 1km from its boundary.

The desktop study identified all recorded archaeological, architectural and other cultural heritage sites within the study area and also included reviews of historic mapping, aerial photographs, historic publications and National Museum of Ireland archives. This information has provided an insight into the development of the study area over time and assisted in an evaluation of the potential presence of unrecorded cultural heritage sites within the proposed development site. No potential unrecorded archaeological sites or architectural heritage features were identified within the proposed development area during the desktop study.

The proposed development site was inspected in August 2017 and November 2018 following crop harvesting. It was assessed in terms of landscape, existing land use, vegetation cover, presence or lack of archaeological/built heritage sites and potential for undetected sub-surface archaeological sites or features. No surface traces of potential unrecorded archaeological sites or buildings of any date were identified within the proposed development area during the site inspection.

There are no recorded archaeological sites located within the proposed development site, or within 120m of its boundary, while there are five examples located within 300m of the site boundary. These comprise a levelled ringfort (CO063-114----) and the recorded site of an underground souterrain (CO063-115----) in lands to the west and three levelled burnt spreads in the lands to the south (CO074-131----, CO074-132---- and CO074-172----). None of these sites are visible from the proposed development site.

No potential archaeological sites were noted within the proposed development site during the desktop study and site inspections. However, archaeological sites of the prehistoric and medieval periods typically contained a variety of timber-built structures and associated features that leave no above ground traces but the potential exists for their remains, and associated deposits and artefacts, to survive beneath the ground surface. While the extensive ploughing activity within the proposed development site may have negatively impacted on any unrecorded, sub-surface archaeological features within the fields, the potential exists for the survival of such features within the site.

The Record of Protected Structures and the National Inventory of Architectural Heritage (NIAH) do not list any structures located within 600m of the proposed development site and there are no buildings of any date located within the site boundary. The earthen field bank which forms the boundary between Lahardane and Ballincolly townlands extends through an area in the south end of the proposed development site and is deemed to be of low cultural heritage significance.

Given the scale and extent of the proposed development within an undeveloped area of farmland, a programme of pre-development licensed archaeological investigations, to comprise a geophysical survey followed by archaeological test trenching, will be undertaken across the proposed development site. It is noted that the Cork City Council report to An Bord Pleanála in relation to the proposed development stated that these mitigation measures were acceptable.

The test trenching will include an investigation of the section of the boundary between Lahardane and Ballincolly townlands which extends into the south end of the proposed development site. In the event that any sub-surface archaeological deposits, features or artefacts are identified during these site investigations they will be recorded and cordoned off

while the Planning Authority and the National Monuments Service are consulted to determine any further mitigation measures in advance of commencement of the construction phase. Any required mitigation measures will be enacted prior to and during the construction phase and no mitigation measures during the operational phase are envisioned.

The assessment concludes that the proposed mitigation measures will provide for either the avoidance of the cultural heritage resource or the proper and adequate recording of this resource (including currently unknown archaeological features). As a result, there will be no predicted residual impacts on the cultural heritage resource following the construction phase. It is noted that there are a number of obligatory processes to be undertaken as part of applications to the National Monuments Service (NMS) for the licences which are required to undertake geophysical surveys and archaeological test trench excavations, and these will allow for monitoring of the successful implementation of mitigation measures.

12.0 Landscape and Visual Impact

Chapter 12 of the EIAR assesses the proposed development in terms of landscape and visual impact. On balance, there will be a predicted High and Neutral Significance of impact on Landscape Character.

While the proposed residential development will radically alter the site, transforming it from tillage farmland to a series of residential neighbourhoods, this level of change is consistent with expectations for lands zoned for residential development and will arise from the provision of access infrastructure and the housing layouts which, in the steeper western part of the site, require cut and fill operations to provide suitable development platforms. The landscape design strategy for the site is based on: -

- Provision of short, medium and long-term remedial mitigation measures in the form of significant tree, woodland and hedgerow planting across the site on open spaces, along embankments arising from cut and fill operations, through the wayleave park corridor and along boundaries will mitigate the loss of those sections of hedgerows affected by the development and provide a sustainable landscape framework into which the development will be integrated as it matures.
- Conservation and enhancement of existing site assets such as boundary hedgerows wherever possible.
- Prioritisation of 'place making' as the key driver for the evolution of site layout, open space provision, permeability, connectivity and the accommodation of recreational facilities. Key features arising from this approach are: -
 - Legible hierarchy of access road and streets
 - The accommodation of neighbourhoods on development platforms which are cut into the hillside topography in the western part of the site.
 - Excellent passive supervision of public realm open spaces and route ways

These core design principles will play an important role in delivering a sustainable landscape framework for the site which will play a key role in defining the character of the new residential neighbourhoods, the nature of their relationship with the surrounding landscape and how they will be experienced in local and distant views of the site.

Visual Impact

The visual impact assessment examines 20 viewpoints in the vicinity of the site comprised of local and distant views. Each of the 20 viewpoints generates 6 visual impact assessments relating to the 6 phases of development proposed for the site. This results in a total of 120 assessments.

At the macro (wider) landscape level, views of the proposed development site are generally from vantage points on high ground located to the south associated with the southern and north-west of the site. In these views distance has a diminishing effect such that visual impacts are found to be neutral for the majority of viewpoints. Short-term adverse impacts are found to be mitigated in the medium to long term as remedial mitigation measures in the form of tree planting take effect. In just one of the views medium level adverse impact is recorded for one phase of development.

At the micro (local) landscape level, topography and tree cover play a substantial role in limiting views of the site but there are a number of views which give rise to short-term adverse visual impacts relating to the initial prominence of the development. These, however, are mitigated in the medium-to long term as remedial mitigation measures in the form of tree planting take effect to soften the profile of the new houses and provide a strong sense of integration in the landscape setting.

13.0 Risk Management

This chapter of the EIAR identifies and considers the likelihood and potential significant adverse effects on the environment arising from the vulnerability of the proposed development to risks of major accidents and/ or natural disasters. To address unforeseen or unplanned effects

Directive 2014/52/EU requires that an EIAR takes account of the vulnerability of the project to risk of major accidents and / or disasters relevant to the project concerned and that the EIAR therefore explicitly addresses this issue. The extent to which the effects of major accidents and / or disasters are examined in the EIAR should be guided by an assessment of the likelihood of their occurrence (risk). A risk-analysis-based methodology, which covers the identification, likelihood and consequence of major accidents/ natural disasters has been used for the assessment.

It is noted that the proposed development has been designed and will be constructed in accordance with best practice construction methods and guidelines and as such major accidents will be very unlikely. The Site-Specific Risk Assessment identifies and quantifies risks associated with the construction and operation of the proposed development. It focuses on unplanned but possible events that could occur.

It is considered that the main risks associated with the proposed development will arise during the construction phase. MHL Consulting Engineers have carried out a Design Risk Assessment as part of the design process, with the aim of reducing risk through design, for the proposed scheme. The findings of this assessment have informed the scheme layout and will be further developed prior to the construction stage. It is also noted that a Construction Environmental Management Plan for the construction period accompanies this planning application. The CEMP identifies the environmental considerations associated with the construction process and outlines proposed work practices, management, mitigation and monitoring strategies to ensure the project is carried out in accordance with best practice,

minimum impact on the surrounding environment and maximum safety throughout the duration of the scheme.

The CEMP will be a live document during the construction period and continuously updated to ensure that potential risks of major accidents and/or disasters are identified, avoided and mitigated as necessary.

As noted the proposed development will be built in accordance with best international current practice and as such mitigation against the risk of major accidents and or disasters will be embedded throughout the design stage. For example, emergency measures will be provided for the pumping station on the Ballyhooly Road which may include a generator to manage outages. On site boundary treatments will also be designed so as to prevent surface water flows from the pumping station to the adjacent watercourses and the proposal will be designed and engineered to be sealed so as to prevent ground water infiltration to the pumping station.

In addition, under the provisions of the Building Control Regulations 2006 – 2018, each separate building is to be the subject of a separate Fire Safety Certificate Application. The applications for the Fire Safety Certificates will be submitted to the Local Authority Fire Department and each application will be accompanied by a fire safety compliance report and fire safety compliance drawings. The reports and drawings will demonstrate in detail how each building is to comply with Part B (Fire) of the Building Regulations 2006 – 2018. All areas of the overall development are to be provided with a number of active fire protection systems as part of the fire safety strategy. Full details of these will be set out in the compliance report submitted with the application for the Fire Safety Certificate.

The assessment concludes that through the implementation of mitigation measures, there are no identified major accidents and or natural disasters that present a sufficient combination of risk and consequence that would lead to significant residual impacts or environmental effects.

14.0 Interaction of the Foregoing

The purpose of this chapter of the EIAR is to draw attention to significant interactions and interrelationships in the existing environment. Potential interactions between environmental factors are set out and assessed. The relevant consultants liaised with each other and the project design team where necessary to review the proposed scheme and incorporate suitable mitigation measures where necessary. As demonstrated throughout this EIAR, most inter-relationships are neutral in impact when the mitigation measures proposed are incorporated into the design, construction or operation of the proposed development.

15.0 Summary of Mitigation and Monitoring

Chapter 15 of the Environmental Impact Assessment provides a summary of the mitigation measures and monitoring proposed for each discipline where relevant. A Construction Environmental Management Plan (CEMP) 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.

16.0 Cumulative Impacts

Where relevant the EIAR also takes account of other development within the area. Each of the relevant specialists has considered the potential for cumulative impact in preparing their assessments. Each Chapter of the EIAR includes a cumulative impact assessment of the proposed development with other planned projects in the immediate area. The potential cumulative impacts primarily relate to traffic, dust, noise and other nuisances from the construction of the development, with other planned or existing projects, and each of the relevant EIAR chapters has regard to these in the assessment and mitigation measures proposed.