

Limerick WWTP Upgrade and Regional Bioresource Centre

Environmental Impact Assessment Report Volume 1: Non-Technical Summary

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Formerly JB Barry Partners who became part of Egis in 2023

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1 INTRODUCTION

1.1 Project Background

This document is the Non-Technical Summary of the Environmental Impact Assessment Report prepared for the proposed upgrade of the Limerick Wastewater Treatment Plant and Regional Bioresource Centre. The Environmental Impact Assessment Report accompanies a planning application made directly to An Coimisiún Pleanála under Section 37E of the Planning and Development Act 2000 (as amended). An Environmental Impact Assessment Report is an assessment and analysis of potential impacts on the receiving environment caused by the Proposed Development. As a part of the screening and scoping stage for the project, Environmental Impact Assessment Screening Report and Environmental Impact Assessment Scoping Report was prepared by EGIS (2025).

This Non-Technical Summary describes the Project, Environmental Impact Assessment process and summarises the key environmental impacts arising from each of the environmental assessments carried out by a panel of experts in accordance with best practice. It summarises, in non-technical language, the likely significant effects identified, the mitigation and monitoring measures proposed, also any residual effects arising from the Proposed Development that have been identified.

1.2 Project Need

The upgrade and expansion of the Limerick Wastewater Treatment Plant is required to ensure that the existing facility can continue to provide safe, reliable and compliant wastewater treatment for Limerick City and its wider agglomeration. The current plant, designed for 130,000 Population Equivalent (PE), is operating at the limits of its capacity and cannot accommodate projected population and economic growth, including committed and future industrial loading. Without intervention, the wastewater treatment plant would become overloaded, leading to deteriorating treatment performance and increased risk of non-compliance with national and European Union water quality legislation. The initial upgrade works will cater for the +10-year growth projections, increasing from 130,000 PE to 285,000 PE including a future industrial committed load of 27,500 PE. There will be provision made in the civil infrastructural development of the plant (tank sizing and pipework) for the +25-year growth projections of 325,000 PE. However, a planning review will be required before any uplift above 285,000 PE can be instated. The upgrade will improve stormwater management through the addition of a new stormwater storage tank, reducing the frequency of uncontrolled spills to the Shannon Estuary. This is essential to protect a designated Special Area of Conservation and to meet the requirements of the Urban Wastewater Treatment Directive. The project also aligns with the National Development Plan and National Planning Framework, supporting sustainable regional growth and reinforcing the plant's role as a key sludge management hub for the southwest. Overall, the Proposed Development is necessary to safeguard environmental quality, ensure regulatory compliance, and facilitate the planned growth and development of Limerick City.

1.3 Site Description

1.3.1 Site Location

The Proposed Development is situated on the banks of Limerick Dock, where the Lower River Shannon meets the Shannon Estuary. These two development sites are approximately 700 meters apart, with Limerick WWTP located in Bunlicky and the Pumping Station in Corcanree with respective townlands separated by Ballinacurra Creek. The proximity of the sites to the river are shown in Figure 1-1.

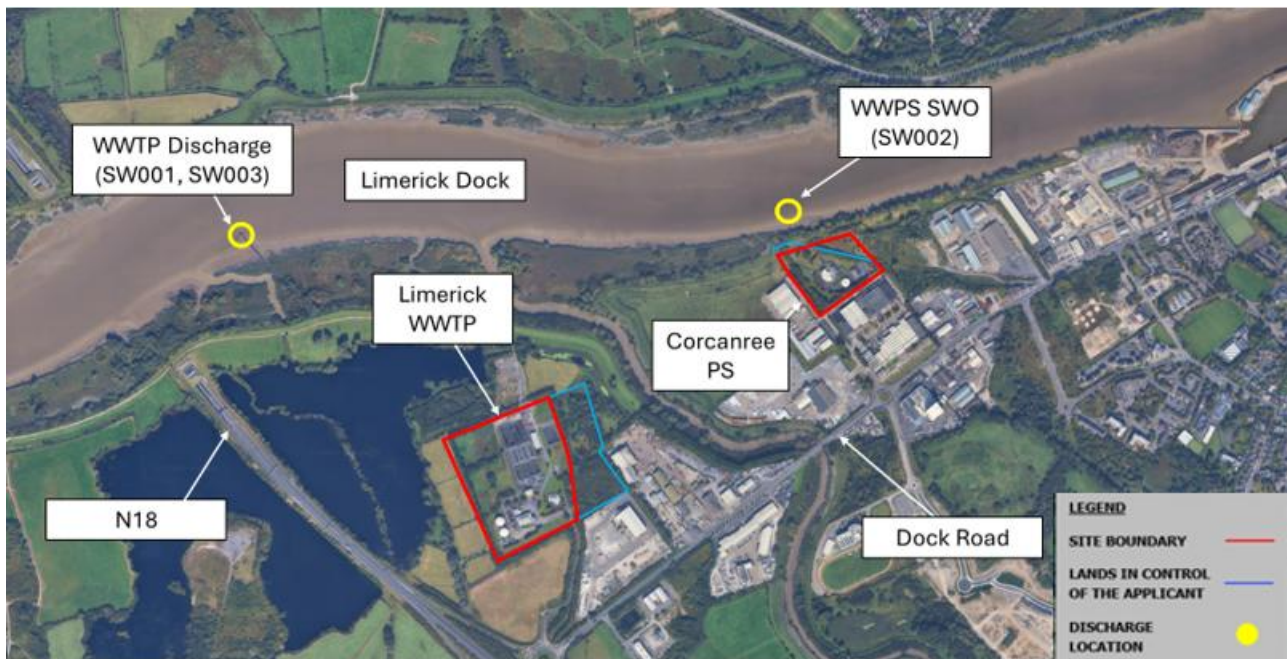


FIGURE 1-1: SITE LOCATION MAP

The immediate surrounding land use is predominantly industrial and port-related, consistent with the long-established character of the Dock Road corridor. Adjacent and nearby land uses include port infrastructure, warehousing and storage facilities, light and heavy industrial units, and other utility installations. A concrete batching plant is located in close proximity, alongside other industrial and commercial operations.

Both sites are accessible via Dock Road (R510), which connects to Limerick City Centre and provides onward access to the N18 and N69 national and regional routes. This road network accommodates the operational traffic associated with industrial and port-related activities in the area.

The sites are adjacent to the River Shannon / Shannon Estuary, which forms part of the Lower Shannon Estuary Special Area of Conservation (Site Code: 002165). This area extends from Killaloe to Loop Head / Kerry Head (approximately 120 km) and is designated for estuarine, intertidal, and riverine habitats, supporting Annex II species including Atlantic salmon (*Salmo salar*), lamprey species (*Lampetra* spp.), otter (*Lutra lutra*), and waterbirds.

1.3.2 Existing Wastewater Treatment Processes

Wastewater treatment plants are designed to reduce pollution levels of wastewater so that it can be returned to the environment i.e. River Shannon, without having negative effects on receiving water quality.

Figure 1-2 displays the main elements of the wastewater treatment processes currently in operation at Limerick WWTP. The main processes include:

1.3.2.1 Limerick WWTP and Regional Bioresource Centre

The existing Limerick Wastewater Treatment Plant treats wastewater from homes, businesses and industry in the Limerick area. In addition to treating wastewater, the facility also treats sludge generated both on site and imported from other wastewater treatment plants.

The plant includes several stages of treatment to clean the wastewater, including the removal of large materials and solids, biological treatment processes to remove pollutants, and sludge treatment facilities. The treated sludge is stabilised through anaerobic digestion, which also produces biogas that will be used to generate energy for the plant.

The plant currently operates below the level required to meet future demand due to limitations in some of the existing treatment infrastructure.

See the main treatment processes within the plant labelled in Figure 1-2 and description as follows:

- Preliminary treatment – the first step is cleaning the wastewater by removing the larger and heavier materials by passing the wastewater through fine screens and chambers.
- Primary treatment – the wastewater will go to the settlement tanks to remove solid material from the before biological treatment.
- Secondary treatment – biological treatment processes are used to remove dissolved and suspended pollutants from the wastewater.
- Nutrient removal – additional treatment processes are used to reduce nutrients, such as nitrogen and phosphorus, before discharge to the Shannon Estuary.
- Sludge treatment – sludge produced during treatment is stabilised through anaerobic digestion, producing biogas that can be used to generate energy for the plant. The sludge is then dewatered before removal from the site.

Stormwater Storage – 7,500m³ tank with return pumping and overflow system via Stormwater Outfall No. 3.



FIGURE 1-2: EXISTING LAYOUT PLAN OF LIMERICK WWTP

1.3.2.2 Corcanree & Mungret PS

Corcanree is the main lift pumping station for Limerick City's sewer network and transfers 90% of flows to the Limerick Wastewater Treatment Plant for treatment. Mungret Pumping Station is located within the treatment plant site (Figure 1-2) and accounts for the remaining 10% of incoming flows.

Flows from Corcanree (Figure 1-3) are pumped 1km to the treatment plant via 900mm diameter twin rising mains. The pumps can forward flows up to 1,250 l/s to the WWTP and remaining stormwater is screened before discharged to the Shannon Estuary.

The pumping station consists of the following elements:

- Pumping station with inlet chamber and two separate streams (including foul wet wells, storm screens and storm wet wells).
- 8 No. storm pumps.
- 4 No. dry well centrifugal pumps.
- Storm syphon chamber.

- Storm and emergency overflow chambers.
- Overflow culvert to Limerick Dock.
- Southern interceptor sewer shaft.
- Emergency generator building; and
- Air valve & surge chamber on 900mm twin rising main.

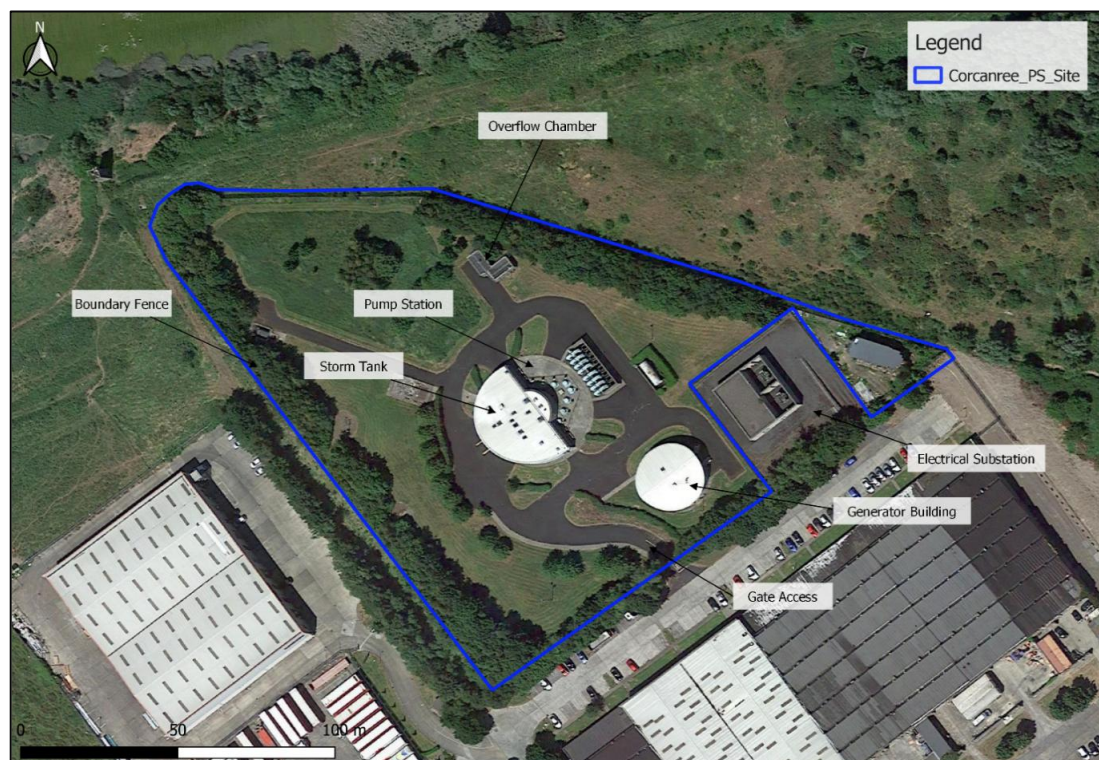


FIGURE 1-3: EXISTING LAYOUT OF CORCANREE PUMPING STATION

1.4 The Planning Process

Pre-application consultation with An Coimisiún Pleanála was undertaken under Section 37B of the Planning and Development Act 2000 (as amended) to determine whether the Proposed Development would be classified as Strategic Infrastructure Development (SID).

The Planning and Development Act 2000 (as amended) provides the statutory framework for planning consents and the control of development in Ireland. The Act (including the Strategic Infrastructure Act 2006) identifies developments of strategic economic or social importance, (i.e. Strategic Infrastructure Developments) under its 7th Schedule. This 7th Schedule of the Act defines 'Environmental Infrastructure', as follows:

"A wastewater treatment plant with a capacity greater than a population equivalent of 10,000 and, for the purpose of this provision, population equivalent shall be determined in accordance with Article 2, point 6, of Council Directive 91/271/EEC."

The Proposed Development comprises an upgrade to the existing Limerick Wastewater Treatment Plant to increase its treatment capacity for the projected 10-year design load to 285,000 PE. As the scale of the project exceeds the thresholds for mandatory Environmental Impact Assessment, the development meets the criteria for SID set out in the 7th Schedule.

In determining whether the project constitutes Strategic Infrastructure Development, An Coimisiún Pleanála considered whether the Proposed Development:

- Contributes significantly to achieving objectives of the National Planning Framework.
- Supports delivery of the Regional Spatial and Economic Strategy for the Southern Region; and

- Would have a significant positive effect on the area of more than one planning authority.

The NPF identifies wastewater capacity and sustainable water services infrastructure as key enablers for the planned population and economic growth of Limerick City and Suburbs. The RSES and the Limerick–Shannon Metropolitan Area Strategic Plan similarly emphasise the need for enhanced wastewater and sludge treatment infrastructure to support regional development. The Regional Bioresource Centre, implemented in tandem with the National Wastewater Sludge Management Plan, will provide regional environmental benefits, reduce sludge volumes, increase energy recovery, lower operating and energy costs, and enhance resource efficiency across multiple local authority areas.

Following consultations under Section 37B of the Act, An Coimisiún Pleanála has determined that the Proposed Development meets the criteria for Strategic Infrastructure Development (see determination letter which accompanies the planning application). Subsequently, as per Section 37E of the Act, the planning application for the Proposed Development will be submitted directly to An Coimisiún Pleanála, accompanied by this Environmental Impact Assessment Report (EIAR).

Section 37E states:

"An application for permission for development in respect of which a notice has been served under section 37B(4)(a) shall be made to the Bord and shall be accompanied by an environmental impact statement in respect of the Proposed Development."

The planning application and all supporting documents, including the Environmental Impact Assessment Report and Natura Impact Statement, will be made available for public inspection for a minimum period of six weeks. During this period, any person or body may make submissions to An Coimisiún Pleanála regarding the implications of the Proposed Development for proper planning and sustainable development, and its likely effects on the environment. An Coimisiún Pleanála may hold an oral hearing at its discretion and will consider all submissions and observations before making its decision.

1.5 Consultation Undertaken

1.5.1 Introduction

Early stakeholder engagement (including dialogue, consultation and the disclosure of information) is a key element of project planning, development and implementation. Effective stakeholder engagement assists good design, build relationships with local community, and reduced the potential for delays through the early identification of risks and issues.

Consultation has been undertaken with stakeholders during the development of the EIAR and statutory consent application in order to:

- Provide information on the Proposed Development.
- Ascertain and understand the views of stakeholders; and
- Seek input from stakeholders on the design, construction and assessment aspects of the Proposed Development.

1.5.2 Statutory Pre-Application Consultation with An Coimisiún Pleanála

Consultation has been undertaken with the planning authority as part of the formal pre-application consultation process for the Proposed Development.

Uisce Éireann submitted a formal request to An Coimisiún Pleanála (ACP) in October 2021 requesting to enter pre-application consultation to determine whether the Proposed Development constitutes Strategic Infrastructure Development (SID) in accordance with the Seventh Schedule of the Planning and Development Act 2000, as amended. As part of this pre-application process, ACP is required to provide advice on:

- the procedural requirements involved in making a Strategic Infrastructure Development application; and

- matters relating to proper planning and sustainable development and the environment, which may have a bearing on its determination.

Subsequent changes to the project scope, including the inclusion of the Regional Bioresource Centre element and the associated Project Business Case, extended the timeline for the planning submission. As a result, the original pre-application consultation process was formally closed.

A new SID pre-application consultation process has since been initiated under Ref. No. 323900. To support the re-commencement of consultations, the appointed Planning Advisor (HWP) prepared and submitted an updated Project Summary and SID Scoping Opinion to An Coimisiún Pleanála. Pre-application consultation meetings were held with ACP on 10th March 2026. Following these meetings, Uisce Éireann submitted a request to close the pre-consultation process. On 19th June 2026, An Coimisiún Pleanála confirmed that the Proposed Development constitutes Strategic Infrastructure Development in accordance with the Seventh Schedule of the Planning and Development Act 2000 (as amended).

As part of this confirmation, ACP also provided a list of Prescribed Statutory Consultees with whom Uisce Éireann is required to engage directly during the SID application process.

1.5.3 Non-Statutory Consultation

Uisce Éireann held a period of non-statutory consultation to engage with relevant stakeholders in relation to the Proposed Development, which commenced on 03 November 2025 for a duration of no. 4 weeks. Non-statutory consultees included the public, elected representatives, and other interested parties (i.e. local industry).

The following strategies were used to communicate with non-statutory consultees:

- Social media and poster campaigns promoting the project publications;
- UE Newsletters;
- Information web page; and
- Contact email address for submissions.

During the consultation period, the Project Team hosted in-person public information events at local venues in Limerick to present the proposed design and associated environmental considerations. The events included open forums for questions and discussion. Key project information and consultation materials, including presentations, were also made available on the project webpage.

1.5.4 Feedback

All feedback received during the consultation period was recorded and considered by the project team. A summary of the responses will be included in the Consultation Report submitted with the planning application to An Coimisiún Pleanála.

2 ALTERNATIVES

2.1 The Do-nothing Scenario

The Do-nothing scenario refers to what will happen if the Proposed Development was not implemented and appropriate upgrade to the wastewater treatment plant was not undertaken.

The Do-Nothing scenario would not deliver the Proposed Development's objectives. With no improvements made to the current treatment or storage systems, demand will continue to increase, and the current system will not increase its capacity sufficiently to meet the future predicted demand (Refer to Chapter 3 - The Proposed Development).

Limerick WWTP

Under the Do-Nothing Scenario, wastewater from the Limerick agglomeration would remain overloaded, and the already overloaded wastewater treatment plant would continue to deteriorate as the population grows. This would lead to inadequate dilution in the receiving waters and pose a significant risk to the ecological integrity of the Lower River Shannon SAC. Water quality would not improve and could further decline. The scenario would also fail to meet the requirements of the Urban Wastewater Framework Directive, EPA Wastewater Discharge Regulations, and would be inconsistent with Uisce Éireann's 2030 energy efficiency target to design, build, and operate assets that are 50% more energy efficient. Overall, the Do-Nothing option would result in major negative environmental, economic, and public-health impacts, making it an unreasonable alternative for the Proposed Development.

Regional Bioresource Centre

Under the Do-Nothing scenario, the existing Sludge Hub Centre at Limerick Wastewater Treatment Plant would continue to operate at its current treatment capacity, with only routine maintenance undertaken. No new sludge treatment infrastructure would be provided to accommodate future increases in sludge generation.

Stormwater Storage

Under the Do-Nothing scenario, untreated stormwater would continue to discharge to the Shannon Estuary. The existing treatment plant does not currently have enough storage capacity to manage high flows during peak flows.

2.2 Alternative Treatment Locations

2.2.1 Limerick Wastewater Treatment Plant Upgrade

The project was first identified in Uisce Éireann's 2017–2021 Investment Plan, where feasibility and optioneering studies were undertaken to identify suitable upgrade solutions. It then progressed into the 2020–2024 Capital Investment Plan, focusing on implementing the selected upgrades to improve performance and regulatory compliance.

The project focuses on upgrading the existing Limerick Wastewater Treatment Plant rather than selecting a new site. The current location already has the required infrastructure, services, and available land, making it the most efficient and sustainable option. Upgrading the existing facility avoids land take, reduces environmental impact, and supports compliance with wastewater regulations while meeting future population and industrial growth needs.

Upgrading the existing Limerick Wastewater Treatment Plant at its current location is the preferred option, as it makes use of established infrastructure, avoids additional land take and habitat loss, and reduces construction impacts. This approach is more resource-efficient, supports regulatory compliance, and provides the required capacity for future growth, resulting in the most sustainable environmental outcome compared to alternative sites.

2.2.2 Regional Bioresource Centre:

Two existing plant sites, Limerick and Clonmel, were shortlisted from the existing sludge hubs as possible locations for the Regional Bioresource Centre. Limerick was favoured due to its larger digesters, lower sludge transport distances, lower whole-life costs, and better environmental and planning conditions.

The site utilises existing infrastructure, requires no additional land take, and is well-located to optimise sludge transport and operational efficiency. It is compatible with planning policy, minimises impacts on sensitive receptors, and benefits from favourable environmental conditions. Overall, it provides the most sustainable and efficient solution compared to alternative locations.

2.2.3 Stormwater Storage Tank

The proposed design capacity for the new stormwater storage tank is 12,500 m³, corresponding to a structure approximately 30–40 m in diameter, installed 10–15 m below ground, with up to 3 m above ground to account for tidal variation. Two primary location options were considered for the new tank:

- Constructing the tank within the existing treatment plant site – this option would require complex construction within an active treatment site, increasing risks to water quality, noise and odour, and potentially disrupting operations. Limited space could constrain future expansion and create operational challenges.
- Constructing the tank adjacent to Corcanree Pumping Station – uses existing rising mains, avoids outfall upgrades, reduces construction risk, preserves space at the treatment plant for future needs, and improves operational efficiency.

Option 2, constructing the new stormwater storage tank adjacent to Corcanree Pumping Station, is considered as the preferred option. It minimises construction disturbance, protects water quality, and avoids disruption to ongoing treatment plant operations. The option also preserves space for future expansion, supports operational continuity, and makes efficient use of existing infrastructure. Overall, it offers the most sustainable, low-risk, and resilient solution compared to the other alternative.

2.3 Alternative Process (Technologies) for Treating Wastewater

2.3.1 Wastewater Treatment Plant Capacity Upgrade

As part of the Feasibility Study Report, a range of technical options were evaluated for upgrading the biological treatment process at the Limerick Wastewater Treatment Plant. The assessment considered factors such as treatment performance, land requirements, energy use, operational efficiency and long-term reliability.

The following four technical options were assessed:

- Ballasted Settling technology;
- Mixed Liquor Vacuum Degassing;
- Conventional Activated Sludge (CAS); and
- Aerobic Granular Sludge (AGS) Process.

Based on the findings of the Feasibility Study Report, the Aerobic Granular Sludge was identified as the preferred option for the proposed upgrade, as it meets the required capacity while minimising land take, energy use, sludge production, and overall environmental impacts. Compared to other options, AGS provides a more compact, efficient, and resilient solution, supporting long-term compliance and future growth.

2.3.2 Regional Bioresource Centre

The technical options appraisal for the proposed Regional Bioresource Centre at Limerick Wastewater Treatment Plant was undertaken in accordance with Uisce Éireann's National Wastewater Sludge Management Plan (NWSMP, 2016), focusing on producing Class A biosolids through anaerobic digestion and heat treatment. Advanced Anaerobic Digestion increases biogas generation and reduces sludge volumes, supporting energy efficiency and circular economy objectives. Heat treatment ensures full sanitisation, with options such as pasteurisation, thermal hydrolysis, and pyrolysis evaluated based on efficiency, reliability, and cost.

Three shortlisted combinations of Anaerobic Digestion (AD) and heat treatment processes were:

- Anaerobic Digestion with Pasteurisation
- Anaerobic Digestion with Thermal Hydrolysis Process (THP)
- Anaerobic Digestion with Pyrolysis

Based on the comparative assessment, Anaerobic Digestion with Thermal Hydrolysis (AD + THP) provides the most sustainable and technically robust solution for the Limerick Regional Bioresource Centre. It offers the best combination of energy efficiency, sludge reduction, and long-term reliability. It maximises renewable energy

generation, reduces transport and material use, and produces a high-quality Class A biosolid. Compared to alternatives, it provides a proven, scalable, and policy-aligned solution with lower environmental and operational risks.

2.3.3 Combined Processes Appraisal

The selection of the preferred process technology considered the need for an integrated biological and sludge treatment system that optimises plant performance, energy balance, and Class A biosolids production. The appraisal assessed feasible combinations that meet current and future requirements within the site's physical constraints.

- Conventional Activated Sludge (CAS) with Pasteurisation
- Conventional Activated Sludge (CAS) with Thermal Hydrolysis Process (THP)
- Aerobic Granular Sludge (AGS) with Pasteurisation
- Aerobic Granular Sludge (AGS) with Thermal Hydrolysis Process (THP)

When evaluated against environmental, technical, and economic criteria, the Aerobic Granular Sludge with THP configuration is identified as the preferred integrated treatment option for the Limerick Wastewater Treatment Plant upgrade. This approach minimises land take, reduces emissions, enhances biogas generation, and produces high-quality Class A biosolids, while offering a compact, efficient, and future-proof solution compared to alternative combinations.

3 THE PROPOSED DEVELOPMENT

3.1 Introduction

This section describes the Proposed Development for which Uisce Éireann is seeking consent. Specifically, this section describes the design and operation elements of the Proposed Development, whilst the construction strategy is described separately in Section 4 of this report. This section of the EIAR has been prepared in accordance with Part 1 of Annex IV of the EIA Directive and describes the following:

- The strategy for procurement of the Proposed Development and how it will influence the detailed design;
- Design requirements;
- The design of the Proposed Development; and
- The operation of the Proposed Development.

3.2 Procurement Strategy

A procurement strategy will be developed to manage risks and ensure effective delivery of the project. The key objectives are to achieve cost certainty, deliver value for money, improve efficiency, allocate risks appropriately, and ensure compliance with procurement legislation.

Procurement will be managed through Uisce Éireann's established frameworks, using experienced suppliers and contractors. The project may be delivered as separate contracts covering the Wastewater Treatment Plant upgrade, the Regional Bioresource Centre, and the stormwater storage tank at Corcanree. Due to the specialist nature of the Aerobic Granular Sludge technology, procurement will consider best value and protection of proprietary design. Further market engagement will be undertaken to define the most appropriate procurement route and contract packaging.

The treatment plant will remain operational during construction, requiring a clear interface plan between contractors and plant operators. Regular coordination, risk assessments, and method statements will be implemented to manage potential impacts on operations, including compliance with emission limits. Roles and responsibilities will be clearly defined, with provision for phased handover where appropriate.

Uisce Éireann has developed a detailed specimen design of the Proposed Development for assessment within this Environmental Impact Assessment Report. This report has considered the likely significant effects on the

environment associated with our detailed specimen design. The contractor will develop this design further, in accordance with the proposed mitigation measures, and any conditions that may be prescribed as part of the consent for the Proposed Development, ensuring that there is no material change in terms of significant effects on the environment.

The appointed contractor is required to comply with all of the performance requirements set out in the tender documentation including the statutory consent approvals and any associated conditions that may be granted by An Coimisiún Pleanála, Department of Housing, Planning and Local Government, EPA and other statutory stakeholders.

3.3 Design Requirements

The Proposed Development will cater for future population and industrial growth within the Limerick agglomeration, in line with projections set out in the National Planning Framework Implementation Roadmap and the Regional Spatial & Economic Strategy for the Southern Region. It provides sufficient capacity to meet the +10-year load of 285,000 PE (including 27,500 PE IDA allowance), with provision for +25-year growth to 325,000 PE, in accordance with Uisce Éireann design requirements for large urban settlements.

The upgrade of the existing sludge hub to a Regional Bioresource Centre will accommodate future sludge loadings equivalent to 637,000 PE, including imported sludges, consistent with Uisce Éireann's National Wastewater Sludge Management Plan.

The development will ensure continued compliance with environmental and wastewater treatment requirements, including standards relating to wastewater treatment performance and stormwater management.

The Proposed Development also includes the installation of a 12,500 m³ stormwater storage tank at Corcanree Pumping Station, which will significantly reduce annual stormwater overflows to the Shannon Estuary and will improve the overall performance and resilience of the wastewater network.

3.4 Design of the Proposed Development

The Proposed Development includes major upgrades to the existing Limerick Wastewater Treatment Plant and Corcanree Pumping Station. All works remain within existing landholdings, apart from the extension to the Corcanree site, with the treatment plant staying fully operational during construction. New infrastructure will be built offline and connected during short, controlled shutdowns.

The main elements of the Proposed Development are:

- Wastewater Treatment Capacity Upgrade

The project will increase the capacity of the existing treatment plant to accommodate future population and industrial growth within the Limerick area. The upgrade includes:

- New inlet works to include screening complete with screenings removal, washing and compaction, grit trap, grit classification and inlet flow measurement;
- Improve odour control system;
- Construction of a new biological treatment process to improve treatment performance and efficiency;
- Upgrades to treated wastewater pumping and discharge infrastructure; and
- Improvements to site drainage and operational systems.

- Regional Bioresource Centre (RBC)

The existing sludge treatment facilities will be upgraded to a Regional Bioresource Centre. This will allow sludge from Limerick and other wastewater treatment plants to be treated at the site. The upgrade includes:

- New sludge reception, storage and treatment facilities;
- Improved sludge thickening and dewatering systems;
- Anaerobic digestion and thermal treatment processes;
- Production and storage of biogas for use on site;
- Energy recovery infrastructure, including combined heat and power systems; and
- Improved odour control and washwater treatment systems.

■ Stormwater Storage (Corcanree Pumping Station)

The upgraded system will:

- Provide additional stormwater storage capacity;
- R stormwater overflows to the Shannon Estuary;
- Improve the resilience and performance of the wastewater network; and
- Improve compliance with future wastewater treatment requirements.

3.5 Operation of the Proposed Development

This section describes the likely operational activities of relevance to this EIAR. It should be noted that as outlined previously, the contractor will be responsible for operating the wastewater treatment plant for an agreed period at the outset of the Proposed Development.

- General maintenance and monitoring of the wastewater treatment plant processes;
- Site Access and Deliveries;
- Environmental, Health and Safety Procedures; and
- Employment of approximately 3 - 5 personnel.

4 CONSTRUCTION STRATEGY

4.1 Construction

Uisce Éireann proposes to procure the construction of the plant upgrade by means of a Design and Build type contract or through separate design-and-build contracts for the various elements of the works. This type of contract has the benefit of encouraging innovation and value engineering, particularly for a project of this nature and scale, by giving the contractor(s) responsibility for the detailed design and construction. Under this type of contract, the successful contractor will ultimately be responsible for the final detailed design and determination of appropriate construction activities required for the Proposed Development.

It will be the responsibility of the contractor(s) (under the obligations of the Design and Build type contract) to ensure compliance with those measures that have been outlined in this EIAR to avoid and/or reduce significant adverse effects that have been identified. It will be the responsibility of the contractor(s) to ensure compliance with or obtain the relevant licenses, permits and consents for such changes to what is defined in the granted planning consent.

The construction of the Proposed Development is estimated at between 36 and 48 months. An initial approximate 3-month period will be required to undertake site investigations and detailed design.

The construction programme for the Proposed Development will follow a phased sequence beginning with a 3-month detailed design period, followed by approximately 2 months for site establishment and clearance. The major construction activities include 18 months for the new 157,000 PE inlet works and AGS process stream at the treatment plant, and a parallel 18-month programme for the new 12,500 m³ storm tank at Corcanree. Civil construction of remaining sub-surface and above-ground structures will require a further 12 months, with approximately 2 months allocated for open-cut installation of interconnecting pipework and 2 months for diversion of one rising main from Corcanree to the new process stream. Refurbishment of the two existing

digester feed tanks will take 2 months, followed by an 8-month period for installation of process, mechanical, and electrical equipment. Site finishes and landscaping will require approximately 2 months. Testing and commissioning of individual elements will occur progressively over a 3-month period, before a final integrated commissioning phase confirms full operational performance. Performance testing of the upgraded systems will take an additional 3 months, and final decommissioning of redundant equipment will require approximately 2 months.

The Proposed Development includes a temporary construction compound located to the north of the existing WWTP site. This compound will facilitate the construction works and associated activities during the construction phase. The EIAR also assesses the potential use of a temporary construction compound on lands to the south of the existing WWTP site as a contingency construction arrangement, should it be required. The assessment of both construction scenarios ensures that the potential environmental effects have been fully considered. Another construction compound will be located within Corcanree PS site. These compounds will provide offices, welfare facilities, storage and space for plant and equipment. Initial works will include forming access points, levelling the area, installing hoarding, lighting, CCTV and temporary services. Limited parking will be provided in line with the Construction Stage Mobility Management Plan, and measures will be implemented to manage dust, runoff and fuel handling, as set out in the Construction Environmental Management Plan. Materials may be stored temporarily for reuse subject to appropriate authorisations. The compound will remain secured for the duration of construction and will be fully removed and reinstated to its original condition once works are complete. Construction traffic will use a haul road through agricultural lands to connect the existing site access with the western boundary road.

Enabling works for the Proposed Development include establishing construction traffic management, implementing surface water controls, installing hoarding, setting up storage and compound areas, removing vegetation and topsoil, and carrying out required utility diversions. Utility works will involve locating, protecting, decommissioning and diverting existing underground services, followed by excavation, installation, backfilling and reinstatement in line with utility and local authority requirements. Drainage works will install carrier drains, gullies and drainage measures to manage surface water during construction. Site investigations undertaken in 2021 included trial pits and boreholes at Limerick Wastewater Treatment Plant and Corcanree, with further investigations expected during detailed design. Excavation and remediation will involve monitoring for contamination, removing unsuitable material to licensed facilities, and reusing clean topsoil where appropriate.

Indicative construction methods for the Proposed Development includes:

- Wastewater Treatment Capacity Upgrade.
- Construction of new stormwater storage tank to the existing Corcanree PS.
- Upgrade of the existing sludge hub to a Regional Bioresource Centre sized to accommodate a future sludge.

4.2 Management

4.2.1 Traffic Management

A detailed construction traffic management plan will be prepared by the contractor(s) in advance of any works taking place on site and submitted to Limerick City and County Council for approval. High level agreements with Limerick City and County Council will be sought in advance of works commencing and any requirements or constraints will be incorporated into contract documents for the works.

Access to the site will use the existing road from Dock Road East Roundabout with a temporary haul road across southern lands to the western boundary, enabling ongoing plant operations before reinstating the land after construction.

It is anticipated that there will be up to approximately 80 construction employees on site during the peak construction period. The core construction working hours for the Proposed Development will be:

- 7am - 7pm: Monday to Friday.

- 8am - 2pm: Saturday.

Hoarding and fencing will be erected within the site to segregate construction works areas from plant operations that will remain in-situ for the duration of the construction works. Hoarding will also be erected along the south-eastern section, the hoarding/fencing will be up to approximately 2.4m high.

Site services will be installed in parallel with the rearrangement and diversion of existing utilities, where relevant. Site lighting will typically be provided by tower mounted 1,000W metal halide floodlights at the various work areas in the Proposed Development site. Site lighting during construction will be subject to a temporary design that minimises light pollution.

Construction of the Proposed Development will require the import of materials to site as well as the export of materials generated and surplus to requirements. Where practicable, efforts will be made to manage materials in accordance with the waste hierarchy and promote the reuse and recycling of materials on site.

4.2.2 Environmental Management

A Construction Environmental Management Plan (CEMP) has been prepared for the Proposed Development, setting out the minimum environmental, health, safety and community protection standards that the appointed contractor(s) must follow throughout the Construction Phase. The CEMP, together with the schedule of mitigation measures (refer to EIAR Volume 2 – Chapter 22), will form the basis of the Detailed CEMP to be prepared by the contractor(s) prior to commencement of works. Implementation of the CEMP will ensure that construction-related impacts on local residents, businesses, the public, and the surrounding environment are avoided or minimised.

The Detailed CEMP will be developed in accordance with CIRIA C811D *Environmental Good Practice on Site* (2023) and industry best practice and will be updated regularly as construction progresses. It will be supported by a Construction Management Plan and detailed Method Statements, ensuring that all mitigation measures identified in this EIAR are fully integrated into site operations.

In addition to the CEMP, it is anticipated that the contractor will prepare a Construction Management Plan and relevant Works Method Statements in advance of any works commencing on site. Every effort will be made to ensure that any significant environmental effects as described in this EIAR will be avoided, prevented or reduced by adopting the mitigation measures outlined in this EIAR.

4.2.2.1 Communications

Uisce Éireann and its contractor(s) will maintain proactive engagement with local residents, businesses, authorities and stakeholders. Advance notification will be issued regarding the nature, duration and working hours of upcoming construction activities, and a helpline number and project website will be provided. Emergency works will be communicated as soon as practicable. A comprehensive Communications Plan, aligned with Uisce Éireann's Community Engagement Plan, will guide all stakeholder interactions during construction.

4.2.2.2 Construction Traffic Management Plan

A Construction Traffic Management Plan will be prepared as part of the Detailed CEMP to manage interactions between construction traffic and the public. It will set out measures to minimise disruption, ensure safe vehicle movements, and comply with all relevant mitigation measures and conditions of approval. The Construction Traffic Management Plan will be implemented prior to construction and traffic management measures will be maintained throughout the construction works.

4.2.2.3 Surface Water Management Plan

A Surface Water Management Plan will be implemented to protect surface waters and hydrological pathways during construction. It will include measures for controlling sediment, managing runoff, and preventing pollution, in line with EIAR mitigation requirements. The contractor(s) will prepare a construction-stage Surface Water Management Plan aligned with the CEMP, and any conditions attached by An Coimisiún Pleanála.

4.2.2.4 Construction Resource and Waste Management Plan

A Construction Resource and Waste Management Plan (CRWMP) will be prepared in accordance with the EPA (2021) *Best Practice Guidelines*. It will detail how waste streams will be prevented, minimised, reused and managed throughout construction. All waste will be handled by appropriately permitted facilities, and any Class U2 material will be disposed of at licensed sites.

4.2.2.5 Environmental Incident Response Plan

The contractor(s) will prepare an Environmental Incident Response Plan to ensure rapid and effective action in the event of spills, sediment releases, licence non-compliances, or other incidents. This plan will set out clear procedures for containment, reporting, corrective action and communication with authorities and stakeholders, and will reflect all EIAR and planning conditions.

4.2.2.6 Sustainable Construction Principles

Sustainability considerations embedded in the CEMP include:

- Minimising material use and waste generation through careful planning and reuse;
- Reducing carbon footprint via sustainable construction methods and materials;
- Encouraging innovation in environmental performance during construction; and
- Protecting workers and communities through best-practice health, safety and wellbeing measures.

4.2.2.7 Mitigation Measures

All mitigation and monitoring measures identified across the EIAR will be implemented to avoid, reduce, or offset potential environmental impacts during construction. These measures are summarised in EIAR Volume 2 – Chapter 22 and incorporated into the CEMP.

5 PLANNING AND POLICY

This chapter sets the planning context for the development and implementation of Limerick Wastewater Treatment Plant and Regional Bioresource Centre Project. It identifies and considers the existing policy framework for the Proposed Development in the context of the relevant international, European, national, regional and local planning strategies, plans and policy documents.

European Policy Alignment

The Proposed Development demonstrates strong alignment with key European environmental and sustainability policies.

- It directly supports the objectives of the European Green Deal by promoting circular economy principles, reducing emissions, and improving resource efficiency through enhanced wastewater and sludge treatment processes.
- The project contributes to the EU Zero Pollution Action Plan by reducing contaminants at source and improving water quality, thereby protecting human health and ecosystems.
- It is consistent with the Water Framework Directive by preventing the deterioration of water bodies, specifically the Shannon Estuary, enhancing aquatic ecosystems, and promoting sustainable water use.
- Alignment with the Marine Strategy Framework Directive is achieved through reduced pollutant discharges, supporting the protection of marine environments.
- The Proposed Development ensures compliance with the Urban Wastewater Treatment Directive and its recast provisions by upgrading capacity and treatment standards to meet current and future regulatory requirements.
- It also supports renewable energy and emissions reduction targets through improved sludge management and energy recovery.
- The proposal aligns with the Sewage Sludge Directive by facilitating the safe and beneficial reuse of treated biosolids in agriculture.

- Furthermore, it reflects the objectives of the Birds and Habitats Directives by safeguarding biodiversity and sensitive ecological sites through Appropriate Assessment and mitigation.
- Compliance with the Environmental Impact Assessment Directive ensures that environmental effects are fully assessed and addressed.

Overall, the Proposed Development is firmly grounded in European policy, supporting climate action, environmental protection, and sustainable infrastructure delivery in line with EU legislative and strategic objectives.

National Policy Alignment

The Proposed Development will support the delivery of a range of national policy objectives:

- It demonstrates strong alignment with objectives set out in Project Ireland 2040 and the National Planning Framework. It will facilitate compact and sustainable urban growth in Limerick City by providing essential wastewater infrastructure to accommodate projected population and economic expansion.
- The project is consistent with the National Development Plan by delivering critical water services infrastructure, which is identified as a key investment priority to support housing and economic development.
- It aligns with the Water Services Policy Statement by enhancing capacity, reliability, and sustainability of wastewater services, while improving treatment standards and long-term resilience.
- The development supports national climate policy by reducing energy demand, increasing energy recovery, and contributing to emissions reduction targets under the Climate Action and Low Carbon Development Act and Climate Action Plan.
- It also facilitates housing delivery objectives by enabling the provision of serviced land, in line with Delivering Homes, Building Communities.
- In addition, the project contributes to the River Basin Management Plan by improving water quality, reducing pollutant discharges, and protecting the Shannon Estuary.
- The Proposed Development is closely aligned with the principles of the National Waste Management Plan for a Circular Economy. By promoting resource efficiency and the beneficial reuse of sludge, it will support Ireland's transition to a circular economy.

Regional Policy Alignment

The delivery of the Proposed Development is critical to the realisation of a number of the key objectives of the Southern Regional Spatial and Economic Strategy (RSES). It will:

- Support the delivery of compact and sustainable growth within the Limerick-Shannon Metropolitan Area.
- Reinforce Limerick's role as a key regional growth centre by providing essential wastewater infrastructure required to accommodate future population and economic development.
- The project is consistent with RSES objectives to invest in critical infrastructure, particularly wastewater treatment capacity, as a key enabler of regional development and improved quality of life.
- It aligns with Regional Policy Objectives by supporting Uisce Éireann's investment plans and the sustainable development of strategic wastewater infrastructure.
- The development also ensures that population growth can be managed in an environmentally sustainable manner, protecting water quality and avoiding adverse impacts on Natura 2000 sites.

The Proposed Development supports the coordinated delivery of regional planning objectives by integrating infrastructure provision with long-term environmental protection and sustainable growth.

Local Policy Alignment

The Proposed Development aligns closely with the Limerick Development Plan 2022–2028 by supporting the provision of adequate wastewater infrastructure necessary to facilitate sustainable population and economic growth.

It directly supports Objectives IN O9 and IN O19 through the upgrade of wastewater and sludge treatment facilities, ensuring environmental protection and compliance with regulatory standards.

The development also underpins the Plan's strategic vision of a low-carbon, compact and resilient city by enabling growth while safeguarding water quality in the Shannon Estuary.

Furthermore, it supports the Limerick Climate Action Plan by contributing to sustainable infrastructure, environmental protection, and the transition to a green and climate-resilient region.

Uisce Éireann Policy Context

The development of the Regional Bioresource Centre in the Southwest will meet the objectives of the National Wastewater Sludge Management Plan;

The Water Services Strategic Plan is Uisce Éireann's long-term strategic plan which sets out the strategic objectives for the delivery of water services for the next 25 years up to 2050. The Proposed Developments in wastewater treatment facilities and the RBC in Limerick supports and upholds all of the strategic objectives outlined in the Uisce Éireann Services Strategic Plan as detailed below:

- Strategic Aim 6 Providing for Growth. We will manage the availability of capacity to support housing and the economy in line with national policy.
- Strategic Aim 7 Protecting our Water Environment. We will play our part in protecting and restoring our water environment.
- Strategic Aim 8 Playing our part under the Water Framework Directive. We will work with others to progressively deliver on Water Framework Directive objectives.
- Strategic Aim 9 Contributing to positive Biodiversity. We will manage our assets to have biodiversity net gain.
- Strategic Aim 11 Adopting circular approaches. We manage our assets to maximise resource recovery and resource efficiency and minimise waste.
- Strategic Aim 12 Managing our assets. We will manage the risk and resilience of our services through best practice asset management.
- Strategic Aim 14 Securing long-term funding. We will work with our stakeholders to secure long-term funding for efficient and resilient services.

As the proposed upgrades will assist Uisce Éireann in improving energy efficiency targets and catering for future growth, the proposals are considered to support the objectives of the Water Services Strategic Plan.

Overall Policy Alignment

The Proposed Development demonstrates strong alignment with European, national, regional, local and Uisce Éireann policies by delivering essential wastewater and sludge treatment infrastructure that supports sustainable growth, environmental protection and climate action.

- At a European level, it complies with key directives and strategies by improving water quality, reducing pollution, supporting biodiversity, and promoting circular economy principles through resource recovery.
- Nationally, the project enables the delivery of Project Ireland 2040 objectives by facilitating compact urban growth, supporting housing delivery, and providing critical infrastructure for economic development.
- It is consistent with the National Development Plan and Water Services Policy Statement by enhancing capacity, reliability, and sustainability of wastewater services.
- The development also contributes to national climate targets through improved energy efficiency and increased energy recovery from sludge treatment processes.
- At a regional level, it supports the objectives of the Southern RSES by reinforcing Limerick's role as a key growth centre and enabling infrastructure-led development.
- Locally, the project aligns with the Limerick Development Plan by providing the infrastructure necessary to support sustainable, compact and low-carbon growth while protecting the receiving environment.
- It also safeguards the ecological integrity of the Shannon Estuary through enhanced treatment standards and reduced pollutant discharges.

Furthermore, the development is consistent with Uisce Éireann's strategic objectives by supporting long-term capacity, operational resilience, and resource efficiency. Overall, the Proposed Development represents a key enabling infrastructure project that integrates policy objectives across all levels, ensuring coordinated delivery of sustainable growth and environmental protection.

6 Traffic and Transportation

This chapter of the Environmental Impact Assessment Report provides an assessment of the existing environmental setting and the likely significant impacts on the surrounding transport network, associated with the construction and operation of the proposed Limerick Wastewater Treatment Plant Upgrade and Regional Bioresource Centre development.

At the time of writing, four other developments (including Greenpark Strategic Housing Development, Nursing Home Development, Commercial and Warehouse Development and Ballykeeffe Strategic Housing Development) in the vicinity of Proposed Development have obtained planning permission. To provide a robust analysis, it was assumed that those permitted developments will be completed prior to the commencement of construction works for the Proposed Development in 2028. Those permitted developments shall be considered for this study in both the "Do-nothing" and "Do-something" scenarios. This is because whether or not the Proposed Development is built, the trips generated by those permitted developments will still apply.

Existing Environment

The existing Limerick Wastewater Treatment Plant Site and Corcanree Pump Station Site are located to the north of Dock Road. Both sites are bounded to the north and east by the River Shannon, to the south by the Dock Road and to the west by the N18.

In order to determine traffic behaviour in the vicinity of the subject site, traffic count surveys were conducted for seven locations, including five junctions and two road links on N18, near the subject site on Wednesday, 13th September 2023 from 07:00 hours to 19:00. The locations comprise:

- Junction 1 - Dock Road West Roundabout;
- Junction 2 - Dock Road East Roundabout;
- Junction 3 - Dock Road / Ballykeeffe;
- Junction 4 - Dock Road / Access Road to Corcanree Business Park / Access Road to Limerick Greyhound Stadium Roundabout;
- Junction 5 - Dock Road / Courtbrack Avenue;
- Road Link 1 on N18 - Northwest side of Dock Road Roundabout; and
- Road Link 2 on N18 - East side of Dock Road Roundabout.

To estimate the traffic flows in 2025 Baseline Year, two Automatic Traffic Count (ATC) stations, including N18 Northbound off ramps to Dock Road West RO, DRL SA6, Limerick (TMU N18 096.5N) and SB on ramps to N18 from Dock Road East RO, DRL SA7a, Limerick (TMU N18 097.0S), from Transport Infrastructure Ireland Traffic Count Data in the vicinity of the Proposed Development on Wednesday, 13th September 2023 and Wednesday, 14th May 2025 were utilised. The average percentage change of traffic flows of aforementioned Automatic Traffic Count stations between 13th September 2023 and 14th May 2025 is 4.8%. To provide a conservative assessment, the recorded 2023 traffic surveys were factored up by 5% in order to estimate the 2025 baseline year traffic flows.

The future operation of the road network was examined in the "Do-nothing" scenario. To establish the future year background traffic flows, the 2025 baseline year traffic flows was factored up using Transport Infrastructure Ireland Project Appraisal Guidelines: Unit 5.3 Travel Demand Projections under central growth factor scenario. The future year traffic flows for the "Do-nothing" scenario are equal to the sum of its respective year background traffic flows and the trips generated from those permitted developments during construction and operational phases. It should be noted that the "Do-nothing" scenario is presented alongside the likely construction and operational impacts in the following sections.

Potential Impacts during Construction Phase

The total trip generation for the Proposed Development are equal to the sum of the trips generated for Heavy Goods Vehicles (including element of works (i.e. concreting of stormwater storage / Aerobic Granular Sludge tanks) and daily operation) to/from the sites and the trips generated for staff vehicles to/from the sites.

After review, the highest trip generation of the element of works for both the Limerick Wastewater Treatment Plant Site and the Corcanree Pump Station Site are “concreting of stormwater storage / Aerobic Granular Sludge tanks”. To provide a robust analysis, it was assumed that the highest trip generation for both the Limerick Wastewater Treatment Plant Site and Corcanree Pump Station Site would occur simultaneously.

Overall, the Limerick Wastewater Treatment Plant Site will totally attract 79 vehicles arriving and 43 vehicles departing in the morning peak hour during construction phase, while the Corcanree Pump Station Site will totally attract 57 arrivals and 39 departures in the morning peak hour during construction phase.

To minimise the traffic impact to the Limerick City Centre, it is proposed that all construction vehicles (i.e. Heavy Goods Vehicles) will not travel to/from the Limerick City Centre and therefore, all construction vehicles will not travel to/from the sites via Junction 5. The haul routes were identified for construction vehicles (i.e. HGVs) travelling to/from the Corcanree Pump Station Site and the Limerick Wastewater Treatment Plant Site. It has been assumed that HGVs (i.e. HGVs for “Concreting of Stormwater Storage / AGS Tanks” and Daily Operation) associated with the Proposed Development, including the Corcanree Pump Station Site and the Limerick Wastewater Treatment Plant Site, during construction phase are likely to be attracted to and distributed from the subject sites, following the identified haul routes, with reference to the baseline traffic model.

The future development traffic distribution for staff vehicles at the surrounding junctions will also mirror existing traffic patterns i.e. development generated flows for staff vehicles will be split through the junction proportionally to the existing flows.

In view of the analysis for Junction 1 and Junction 5, the estimated additional trips associated with the Proposed Development during construction phase represent a small proportion of 2025 baseline year traffic flows on the surrounding road network and less than the thresholds for traffic impact assessment as stated in the TII Traffic and Transport Assessment Guidelines (i.e. 10% of the traffic flow on the existing road network and 5% in sensitive environments or where congestion exists) during the morning and evening peak hours. As a result of this negligible increase in traffic volumes on the surrounding road network, it is **not** required to undertake any traffic capacity assessments for Junction 1 and Junction 5 during construction phase in this study. However, it is acknowledged that the estimated additional flows at Junction 2 to Junction 4 are greater than the 5% of the traffic flow on the existing road network where congestion exists or the location is sensitive. Therefore, capacity assessments on Junction 2 to Junction 4 are required. Notwithstanding the minimal % increase in traffic at Junction 1, and in order to have a better understanding of this minimal traffic impact on Junction 1, which is located on the N18, due to the Proposed Development, capacity assessments have also been carried out on Junction 1. As a result, analyses of Junction 1 to Junction 4 were undertaken.

To establish the background future year flows, the 2025 baseline year traffic flows as mentioned was factored up to the 2031 background traffic flows using TII Project Appraisal Guidelines: Unit 5.3 Travel Demand Projections under central growth factor scenario. The 2031 Final Year of Construction traffic flows are equal to the sum of its respective year background traffic flows and the trips generated from those permitted developments to create the “Do-nothing” scenario. Construction traffic associated with the Proposed Development was then applied to this future year flows to create the “Do-something” scenario during construction phase.

The criteria utilised for the assessment of priority and roundabout junction capacity is Ratio of Flow to Capacity (RFC). The Ratio of Flow to Capacity provides a basis for judging the acceptability of junction designs. Typically, a RFC of less than 0.85 normal design threshold for priority junction/roundabout junction is considered to indicate satisfactory performance (i.e. operating in an efficient and stable condition). A Ratio of Flow to Capacity of between 0.85 and 1 for priority junction/roundabout junction represents variable operation, and may be

said to be operating adequately, if the queue and delay are deemed acceptable. RFC values in excess of 1 represents an oversaturated condition.

In 2025 Baseline Year, Junction 1 to Junction 4 are currently operating within the normal design threshold in both the morning and evening peak hours. Additionally, the Road Links 1 and 2 on N18 are also operating within the normal design threshold in both the morning and evening peak hours.

In 2031 Final Year of Construction, Junction 2 and Junction 4 will operate within the normal design threshold in both the morning and evening peak hours for both the "Do-nothing" and "Do-something" scenarios.

For Junction 1, it will operate within the normal design threshold (less than 0.85 RFC) in the morning peak hour in 2031 Final Year of Construction for both the "Do-nothing" and "Do-something" scenarios, and in the evening peak hour in 2031 Final Year of Construction for the "Do-nothing" scenario. It should be noted that the R510 arm on this junction will slightly exceed the normal design threshold (but still less than its theoretical capacity of 1.0) in the evening peak hour in 2031 Final Year of Construction for the "Do-something" scenario, resulting in some minor queues and delays for motorists, an additional 1 PCU which is deemed acceptable.

For Junction 3, it will operate within the normal design threshold in the evening peak hour in 2031 Final Year of Construction for both the "Do-nothing" and "Do-something" scenarios, but the Dock Road West arm on this junction in the morning peak hour in 2031 Final Year of Construction for both the "Do-nothing" and "Do-something" scenarios will exceed the normal design threshold, likely resulting in queues and delays for motorists. However, it is clear from the analysis that the impact on this junction will be mainly due to regular background traffic growth but not the Proposed Development per se (i.e. with DOS increase of 0.04 on Dock Road West arm for the morning peak hour), so traffic from the Proposed Development will only have a minimal impact on this junction.

Additionally, the Road Links 1 and 2 on N18 will also operate within the normal design threshold in both the morning and evening peak hours for both the "Do-nothing" and "Do-something" scenarios.

The analysis results show that the Proposed Development will result in a slight negative short-term impact on the surrounding road networks during construction phase.

Potential Impacts during Operational Phase

It is anticipated that the estimated additional trips as a result of the Proposed Development was revealed to be in total 14 trips inbound and 14 trips outbound in both the morning and evening peak hours during operational phase.

During operational phase, the estimated additional trips as a result of the Proposed Development will travel to the surrounding road networks. In order to provide a robust assessment and simplify the exercise of trip generation as a percentage of 2025 traffic flows in the following section, it was assumed that the estimated additional arrival and departure trips will travel to/from the Proposed Development via all relevant junctions.

In view of the analysis for Junction 1 to Junction 5, the estimated additional trips associated with the Proposed Development represent a small proportion of 2025 baseline year traffic flows on the surrounding road network and less than the thresholds for traffic impact assessment as stated in the TII Traffic and Transport Assessment Guidelines (i.e. 10% of the traffic flow on the existing road network and 5% in sensitive environments or where congestion exists) during the morning and evening peak hours.

As a result of this negligible increase in traffic volumes on the surrounding road network under robust and "worst-case" scenario, it is not required to undertake any traffic capacity assessments for Junction 1 to Junction 5 in this study during operational phase. It is reasonable to assume that the number of additional trips generated by the Proposed Development will remain close to a constant number in future years while background traffic levels will show a steady increase. Therefore, it is anticipated that the Proposed Development will not have significant impacts, similar to the "Do-nothing" scenario, during the operational phase.

During construction phase, the appointed Contractor should monitor traffic flows and vehicle queue lengths at Junction 3 as part of the Detailed Traffic Management Plan. If deemed necessary following monitoring, then mitigation measures (i.e. all construction vehicles (i.e. HGVs) will travel to/from the sites outside the morning peak hour of 08:00-09:00) should be proposed and agreed with the relevant Authorities in order to minimise the traffic impact to public.

No monitoring is proposed for the operational phase of the Proposed Development.

Mitigation Measures

Mitigation measures to manage construction traffic are outlined in Chapter 6 (Traffic and Transport) of the EIAR and will be implemented throughout the construction phase. These measures will minimise disruption to the surrounding road network, maintain safe access and vehicle movements, and ensure that no significant adverse traffic impacts are anticipated during construction.

No mitigation measures are proposed for the operational phase of the Proposed Development.

Residual Effects

During construction, the proposed development will result in a temporary and slight increase in traffic on the surrounding road network. Appropriate traffic management measures will be implemented to minimise disruption and maintain safe vehicle movements.

During operation, the increase in traffic associated with the proposed development will be low and is not expected to result in significant impacts on the surrounding road network.

7 Odour

This Chapter of the EIAR considers the potential odour effects associated with the Limerick Wastewater Treatment Plant Upgrade Project, hereafter referred to as the Proposed Development.

Existing Environment

The purpose of the Environmental Impact Assessment Report is to support the planning application for the Proposed Development to upgrade the existing wastewater treatment plant capacity, sludge treatment capacity and stormwater storage capacity. The work requirements are spread over 2 No. sites, Limerick Wastewater Treatment Plant and Corcanree PS. Both sites are located in an industrial location near the Dock Road, Limerick. The existing land use at both locations comprises of wastewater treatment activities. The closest receptors are commercial and are located within approximately 20m of the site boundaries. The closest residential receptors are located within approximately 400m of the Corcanree Pumping Station site boundary and approximately 500m of the treatment plant site boundary.

The EIAR presents an evaluation of the likely significant environmental impacts and applicable mitigation and monitoring measures associated with the construction and operation of the Proposed Development. This Chapter considers the potential odour impacts of the Proposed Development, describes the methodology used to prepare the report and presents the findings of the assessments.

Impact Assessment Methodology

The methodology adopted for the odour impact assessment study follows best practice Guidance and consists of a number of key stages as follows:

- The magnitude of the potential odour emissions from all sources are identified;
- Sensitive receptors are identified and classified according to their relative sensitivity;
- The magnitude of the odour impacts on receptors are identified; and
- The significance of the effect is assessed as either 'Significant' or 'Not Significant'.

In order to apply the assessment methodology, the magnitude of the odour impact on receptors is quantified and this is achieved using a dispersion modelling assessment for the Operation Phase and the methodology recommended by the Institute of Air Quality Management for the Construction Phase assessment.

Construction Phase Impacts

There is some potential for odour emissions to arise during the construction phase. There is no potential for odour emissions during the vast majority of the construction phase of the Proposed Development. Six of the thirteen Construction Stages have been screened out as having no potential to lead to odour emissions. The remaining 7 Construction Stages do have some potential for the release of odour emissions, but this potential is limited to a short-defined period of time and does not extend to the full duration of the construction works for those elements. The potential effects are assessed as either brief or Temporary and all potential effects are assessed as Imperceptible or Not Significant.

Operation Phase Impacts

There is some potential for odour emissions to arise during the Operational Phase of the Proposed Development and the dispersion modelling assessment demonstrated that odour nuisance will not arise as a result of the emissions. The methodology is based on the EPA Guidelines on Information to be contained in Environmental Impact Assessment Reports (EPA, 2022). Effects are assessed as either Brief or Temporary and all potential effects are assessed as Not Significant based on the finding that the odour assessment criterion is satisfied as set out in the EIAR.

Cumulative impact assessment

The most relevant nearby sites are the Waste sites located adjacent to the sites of the Proposed Development. There will be no significant adverse air quality or odour impacts on the environment as a result of the project or in conjunction with other local developments, existing or planned in the area.

Residual Impacts

The existing and proposed mitigation and management at the wastewater treatment plant will ensure that there are no significant residual effects.

8 Air Quality

The assessment of Air Quality is contained within Chapter 8. The air quality assessment has focused on:

- Potential construction dust emissions and impacts to nearby sensitive receptors such as residential properties, schools, hospitals, etc.; and
- Potential vehicle emissions from traffic accessing the site for construction works and during operation.

Existing Environment

Baseline data and data available from similar environments indicates that levels of nitrogen dioxide (NO₂), particulate matter less than 10 microns (PM₁₀) and particulate matter less than 2.5 microns (PM_{2.5}) and are generally well below the current National and European Union (EU) ambient air quality standards.

Potential Impacts

An assessment of the potential dust impacts as a result of the construction phase of the Proposed Development was carried out based on the UK Institute for Air Quality Management 2024 guidance document '*Guidance on the Assessment of Dust from Demolition and Construction*'. This established that there is a high risk of dust related impacts associated with the Proposed Development. In the absence of mitigation there is the potential for short-term, direct, localised, negative and slight impacts to air quality, which is potentially significant in the absence of mitigation.

In addition, construction phase traffic emissions have the potential to impact air quality, particularly due to the increase in the number of HGVs accessing the site. Construction phase traffic did not meet the scoping criteria

for a detailed modelling assessment outlined in Transport Infrastructure Ireland's 2025 guidance document '*Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106*'. As a result, a detailed air assessment of construction phase traffic emissions has been scoped out, and the construction phase traffic emissions will have a short-term, direct, localised, negative and imperceptible impact on air quality.

Operational phase traffic has the potential to impact air quality due to vehicle exhaust emissions as a result of the increased number of vehicles associated with the Proposed Development. Operational phase traffic did not meet the scoping criteria for a detailed modelling assessment outlined in Transport Infrastructure Ireland's 2025 guidance document '*Air Quality Assessment of Specified Infrastructure Projects – PE-ENV-01106*'. As a result, a detailed air assessment of operational phase traffic emissions has been scoped out, and the operational phase traffic emissions will have a short-term, direct, localised, negative and imperceptible impact on air quality.

There is the potential for ammonia gas emissions during the operational phase. However, in this instance emissions of ammonia are very small and would have an imperceptible impact on ambient air quality. A new combined heat and power boiler is proposed as part of the development, as well as the existing boiler currently in place. However, these units each have a capacity of less than 1 MW, and so emissions will therefore not be significant. There is also a proposed flare, which is to be used as a backup only. Under normal operation, all biogas will be utilised in the Combined Heat and Power boiler. The flare will only operate during start-up/shutdown or fault conditions and is therefore expected to operate infrequently and not as part of routine use. All non-traffic emissions from the operational phase were therefore scoped out of further assessment and the impacts determined to be imperceptible.

Mitigation Measures

Detailed dust mitigation measures are outlined within the air quality chapter to ensure that no significant impacts as a result of construction dust emissions occurs at nearby sensitive receptors. Once these best practice mitigation measures, derived from the Institute for Air Quality Management 2024 guidance '*Guidance on the Assessment of Dust from Demolition and Construction*' as well as other relevant dust management guidance, are implemented the impacts to air quality during the construction of the Proposed Development are short-term, direct, localised, negative and not significant.

No site-specific mitigation measures are proposed for the operational phase. The impact to air quality has been assessed as imperceptible.

There is the potential for cumulative impacts to air quality should the construction phase of the Proposed Development coincide with that of other developments within 500 m of the site. A review of proposed/permitted developments in the vicinity of the site was undertaken.

The recommended dust mitigation measures will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the Proposed Development is *deemed short-term, direct, localised, negative and not significant*.

Operational phase direct impacts on air quality associated with the Proposed Development and cumulative traffic emissions are predicted to be imperceptible.

Residual Effects

Provided the dust minimisation measures are adhered to, the predicted residual air quality impacts during the construction phase are short-term, direct, localised, negative and not significant.

Emissions of air pollutants during the operational phase are predicted to be imperceptible. Therefore, residual impacts to human health related to air quality will be imperceptible.

9 Climate

The assessment of potential climate impacts associated with the Proposed Development is contained within Chapter 9.

The climate assessment is divided into two distinct sections – a greenhouse gas assessment and a climate change risk assessment.

- Greenhouse Gas Emissions Assessment (GHGA) – Quantifies the GHG emissions from a project over its lifetime. The assessment compares these emissions to relevant carbon budgets, targets and policy to contextualise magnitude.
- Climate Change Risk Assessment (CCRA) – Identifies the impact of a changing climate on a project and receiving environment. The assessment considers a projects vulnerability to climate change and identifies adaptation measures to increase project resilience.

Existing Environment

Baseline data indicates that Ireland has exceeded, without the use of flexibilities, its 2024 annual limit set under EU's Effort Sharing Decision (ESD) (EU 2018/842) by 1.03 MtCO₂e. However, the 2024 emissions represent the second consecutive year in which Ireland's emission were below (-4.2%) 1990 levels. Data for 2025 and the results of the first carbon budget period (2021- 2025) are expected to be published in late 2026.

The region of the Proposed Development has a temperate, oceanic climate, resulting in mild winters and relatively cooler summers when compared with continental Europe.

Potential Impacts greenhouse gas assessment

The construction phase of the Proposed Development is predicted to result in 14,304 tCO₂e (3,576 tCO₂e annualised). The majority of greenhouse gas emissions are from the embodied carbon within construction materials such as concrete. The estimated total greenhouse gas emissions annualised over the Proposed Development lifespan are a small fraction of the national sectoral budgets and existing baseline total. This comparison contextualises the impact of the Proposed Development on climate.

The wastewater Treatment Plant emits direct greenhouse gas emissions from sludge treatment and biological wastewater and indirect greenhouse gas emissions from the electricity and heat demand required to operate processes. However, the Proposed Development will minimise operational emissions through 'a combination of energy-efficient process selection, advanced monitoring and control systems, and maximised on-site renewable energy recovery'. Due to the upgraded biogas production facility, the plant has the potential to be self-sufficient and carbon neutral in its main operations.

Once mitigation has been accounted for and the purpose of the Proposed Development (to facilitate increased demand of services), in addition to the Proposed Development significantly reducing the carbon intensity of direct and indirect greenhouse gas emissions compared to the existing facility during operation, has been considered, the significance of effect in accordance with the EPA Guidelines (EPA, 2022), is direct due to its presence, long-term as a result of the estimated lifetime of the infrastructure and negative due to the emission of greenhouse gases. Due to the mitigation measures in place and the fact that the Proposed Development does not impede the trajectory to net zero carbon, the impact on the climate is considered to be not significant.

Potential Impacts climate change risk assessment

Following an initial climate hazard screening, flooding, extreme temperatures, high winds and drought were scoped in as potential climate hazards. A climate vulnerability assessment for the Proposed Development demonstrated it has, at most, low vulnerabilities to the identified climate hazards.

With design mitigation in place, there are no significant risks to the Proposed Development due to climate change. In accordance with the EPA Guidelines (EPA, 2022), the significance of effect of the impacts to the Proposed Development as a result of climate change are direct as climate extremes have a direct physical effect on infrastructure, long-term due to the response times of the climate in relation to changes in anthropogenic

emissions, negative as climate extremes have been shown to damage or adversely affect infrastructure, and not significant due to the low vulnerability of the Proposed Development to the effects of climate change, which is overall not significant in EIA terms.

Mitigation measures and Residual effects

- Greenhouse Gas Assessment

Best practice measures during the construction phase are set out in Section 9.5 of Chapter 9 to ensure there are no significant impacts as a result of the construction works. Once these best practice mitigation measures are implemented the impacts to climate are considered to have a direct impact due to its presence, that is long-term as a result of the estimated lifetime of the buildings and negative due to the emission of greenhouse gases. Due to the mitigation measures in place and the fact that the Proposed Development does not impede the trajectory to carbon neutrality, the impact on the climate is considered to be not significant in EIA terms.

- Climate Change Risk Assessment

Once mitigation measures in Section 9.5 of Chapter 9 have been implemented, the residual effect of climate change on the Proposed Development is considered direct, long-term, negative and not significant in EIA terms.

Cumulative impacts

With respect to the requirement for a cumulative assessment the ISEP (ISEP, 2022) and Transport Infrastructure Ireland (TII, 2022) guidance on which the assessment is based states that:

"the identified receptor for the GHG Assessment is the global climate and impacts on the receptor from a project are not geographically constrained, the normal approach for cumulative assessment in EIA is not considered applicable. By presenting the GHG impact of a project in the context of its alignment to Ireland's trajectory of net zero and any sectoral carbon budgets, this assessment will demonstrate the potential for the project to affect Ireland's ability to meet its national carbon reduction target. This assessment approach is considered to be inherently cumulative".

Although greenhouse gas emissions are associated with the construction phase of the Proposed Development, the upgrades associated with the Proposed Development will significantly reduce the carbon intensity of direct and indirect greenhouse gas emissions during the operational phase, compared to the existing facility, thereby contributing to Ireland's ability to meet its national carbon reduction target. The cumulative effect of the Proposed Development in relation to greenhouse gas emissions is therefore considered direct, long-term, negative and slight, which is overall not significant in EIA terms.

10 Noise and Vibration

The Noise and Vibration Impact Assessment consider the potential effects of the proposed Limerick Wastewater Treatment Plant Upgrade and Regional Bioresource Centre Project on nearby residential properties and other sensitive locations during both construction and operation.

Existing Environment

Baseline noise surveys were undertaken at representative nearby locations. The results indicate that the existing noise environment is primarily influenced by road traffic. The current wastewater treatment plant and pumping station are not audible at nearby sensitive receptors. Measured noise levels already exceed World Health Organisation guideline values, indicating a relatively elevated baseline noise climate.

Construction Phase

During the construction phase, temporary increases in noise will arise from activities such as site clearance, excavation, construction plant operation and vehicle movements. Piling works will also be required for short durations. Construction activities will be restricted to daytime hours. Predicted noise levels at the nearest

residential receptors are below recommended guideline limits. Vibration levels are expected to be negligible and not perceptible at nearby properties. Overall, construction impacts are assessed as slight and short-term.

Operational Phase

During operation, noise will arise from plant and equipment such as pumps, blowers and internal processes, as well as site-related traffic. The assessment indicates that predicted operational noise levels at nearby receptors will be low and within applicable guideline limits. The increase in noise levels relative to existing conditions is predicted to be imperceptible. Road traffic will remain the dominant source of environmental noise. Operational impacts are therefore considered negligible and not significant.

Mitigation Measures

Standard good practice mitigation measures will be implemented to minimise noise impacts. These include the use of well-maintained plant, selection of quieter equipment where practicable, restriction of working hours, and implementation of appropriate construction management measures. Monitoring may be undertaken, if required, to ensure compliance with relevant limits.

Residual and Cumulative Effects

Following the implementation of mitigation measures, construction noise impacts will be minor and temporary, while operational noise impacts will be negligible. No significant cumulative impacts are anticipated in combination with other developments.

Conclusion

The assessment concludes that the Proposed Development will not give rise to significant noise or vibration impacts. Temporary construction effects will be short-term and controlled, and operational noise levels will remain within acceptable limits.

11 Archaeology, Architectural and Cultural Heritage

An Archaeology and Cultural Heritage assessment for the Limerick Wastewater Treatment Plant Upgrade and Bioresource Centre Project was prepared by Donald Murphy and Magda Lyne, Archaeological Consultancy Services Unit Ltd.

Existing Environment

The site is located within the Limerick Wastewater Treatment Plant (Limerick Wastewater Treatment Plant) in the townland of Ballykeeffe (ITM coordinates 554555, 655666) and in a field adjacent to the Corkanree Pump Station site (Corkanree PS) in the townlands of Corkanree and Courtbrack (ITM coordinates 555388, 656188).

Archaeological Impact Assessment including site inspection, was undertaken in order to identify and describe known and potential archaeological and cultural heritage constraints within the Proposed Development area and its environs and to offer recommendations for the mitigation of such potential impacts.

The works will include capacity upgrade and the construction of a Regional Bioresource Centre (RBC) at Limerick Wastewater Treatment Plant, and a new storm water tank and associated installations/pipework at Corkanree PS.

The Proposed Development site contains no Recorded Monuments listed within the Record of Monuments and Places for County Limerick. The nearest monument to Limerick Wastewater Treatment Plant is an enclosure (LI005-075----) located c. 330m to the southwest, while the nearest monument to Corkanree Pump Station is a Metalworking site (LI005-077----) located c. 420m to the southeast.

There are no Protected Structures, as listed in the Limerick Development Plan 2022–2028, located within the site, nor are there any sites listed in the National Inventory of Architectural Heritage (NIAH). The nearest such site is Spillane's Tower (RPS ID 3258; NIAH Reg. No. 21527001), listed as a beacon on the bank of the River Shannon, located c. 27m north of the edge of the Corkanree Pump Station.

There are no wrecks listed in the Wreck Inventory of Ireland Database (WIID) specifically for Ballykeeffe, Corkanree or Courtbrack townland.

The site was not subject to archaeological investigation previously. The nearest assessment to the site took place in relation to the Limerick Southern Ring Road and included excavation and an underwater survey. To the south of the site, a fulacht fia was excavated in advance of the road development (Under Ministerial Order No. A005). The burnt mound spread measured 7m by 7m and was 0.35m thick, sealed by alluvium. A rectangular trough, measuring 1.8m by 0.9m by 0.3m deep, with two poorly preserved timbers was also recorded; this site is now a monument, SMR LI013-228----. Underwater assessment and survey (A005/1010) associated with the Limerick Southern Ring Road, took place in the footprint of the development area and a 200m stretch of the southern shoreline of the River Shannon. No archaeologically significant material was revealed.

The National Museum of Ireland Topographical Files were reviewed. No finds are registered for the townlands of Ballykeeffe, Corkanree or Courtbrack.

Construction Phase Impacts

The predicted effects on the known architectural heritage are regarded as being none. There are no effects on Protected Structures (RPS) or sites in the National Inventory of Architectural Heritage (NIAH) as none are present within the site. An indirect visual effect on the nearest such site, Spillane's Tower (RPS ID 3258; NIAH Reg. No. 21527001), located outside the Proposed Development site boundary, was noted, with slight visual impact predicted. However, given the presence of the already operating Corkanree PS and the tree cover present, the effect will be negligible.

The presence of an embankment, also forming a townland boundary, was noted within the current Corkanree PS site. The embankment is depicted since the 1840 OS map but is not visible by the time of the aerial imagery in the mid-1990s, and the results of the site visit suggest it was levelled and used to raise the ground in the area.

In order to mitigate the potential impact of the Proposed Development on the potential previously unknown architectural/cultural heritage (embankment/townland boundary), archaeological monitoring will be undertaken during ground disturbance works where required.

There is no potential for direct impacts on known archaeology. However, there is some limited potential for the development impacting upon unknown, buried archaeological remains if such are present within the site. The site is within the historical flood plains of the River Shannon. Excavation of such have some limited potential to expose fish traps, trackways, canoes, boats or objects related to fishing and hunting, due to good preservation in waterlogged deposits. This could also include unrecorded archaeological remains that were sealed by made up ground, that could have been introduced to the site prior to the construction of the facility. Deeper excavations could expose estuarine deposits that might contain 'in situ' archaeological material or features.

Mitigation Measures

In order to mitigate the potential impact of the Proposed Development on potential archaeological remains, the following measures shall be adhered to:

- Archaeological monitoring of all groundworks shall be undertaken by an experienced, licence-eligible archaeologist working under licence from the DHLGH. Test trenching is not feasible as the site is located within historic flood plains, with the potential for archaeological remains to survive deeply stratified in natural sediment accumulations, hence identification during test trenching would be particularly challenging. Should any subsurface remains of the embankment and any associated features be identified, these shall be recorded during monitoring.
- Any archaeological features, deposits or artefacts identified during monitoring will require mitigation. Groundworks within that area should be halted and the appropriate authorities informed. The archaeological remains will be preserved in situ or by record (excavation) following consultation with the National Monuments Service. Adequate time and resources will be provided by the developer for the

resolution of any archaeology identified within the development site that will be directly impacted by groundworks. Time and resources will also be allowed for any post-excavation work and specialist analysis necessary following any archaeological excavation that takes place;

- A report is required to be compiled on completion of any archaeological monitoring and excavation and will be submitted to the relevant authorities.

If these recommendations are implemented, the potential impact on archaeological and built heritage material will be sufficiently mitigated.

Residual Effects

With mitigation measures in place the residual effects are likely to be neutral and none to imperceptible.

12 Biodiversity Marine

The proposed upgrade to the Limerick Wastewater Treatment Plant has been assessed to understand how it could affect marine and estuarine life in the Lower River Shannon Estuary. This estuary is a designated Special Area of Conservation (SAC) and supports a range of important habitats and species. These include communities of marine and estuarine fauna living in the seabed (benthic communities), migratory fish such as salmon and lamprey, and marine mammals such as bottlenose dolphins.

Existing Environment

The part of the estuary near the Proposed Development is influenced by tides and changing freshwater inputs. It is characterised by soft, muddy sediments, naturally cloudy water, and changing salinity levels. The seabed in this area supports communities of species that are well adapted to these conditions, particularly worms that can tolerate low oxygen levels and higher levels of organic material. As a result, the number of different species present is relatively low, but those that are present are suited to this naturally variable and already influenced environment. The estuary also acts as an important route for fish moving between the sea and freshwater rivers. Marine mammals are known to use the wider estuary, although they are more commonly found further downstream.

Construction Phase Impacts

During construction, all works will take place within the existing wastewater treatment plant site and nearby infrastructure areas. No works will be carried out within the estuary itself. The main potential risk during this phase is that sediment or pollutants could enter nearby drains and, from there, reach the estuary. However, the works are located some distance from the main estuary channel, and standard construction controls will be in place to prevent pollution. As a result, there is no direct pathway for impacts on estuarine habitats or species. Any potential effects would be limited to a small area, short in duration, and temporary. Overall, construction is not expected to have significant effects on marine biodiversity.

Operational Phase Impacts

During operation, the upgraded wastewater treatment plant will treat wastewater more effectively and reduce the number of untreated discharges. Although the overall volume of treated water released will increase, its quality will be significantly improved. Any changes to water quality are expected to be small and limited to the immediate area around the discharge point, with no noticeable change across the wider estuary. Because of this, no significant effects are expected for seabed habitats, fish, or marine mammals. The improved treatment is expected to reduce the amount of organic material entering the estuary, which may gradually support a wider range of species in the area close to the discharge point, although this will still be influenced by the natural conditions of the estuary. Overall, the operational phase is expected to have a neutral to slightly positive effect on water quality in the estuary.

Mitigation Measures

Measures will be put in place during construction to protect water quality. These include managing surface water runoff, storing and handling fuels and chemicals carefully, and having procedures in place to deal with

accidental spills. These measures will be followed throughout the construction period. During operation, the plant will continue to be monitored and regulated to ensure it meets environmental standards.

In summary, the Proposed Development is not expected to have significant effects on marine biodiversity. The upgrade will improve the performance of the existing treatment plant and is expected to maintain, and potentially slightly improve, environmental conditions within the estuary.

Residual Effects

Following implementation of the mitigation measures, residual impacts on estuarine and marine biodiversity from the construction phase are predicted to be not significant.

Overall, operational effects on the Shannon Estuary are predicted to be localised, low in magnitude and not significant, with no residual effects on estuarine ecology or the integrity of protected European sites anticipated.

13 Biodiversity Terrestrial

This chapter assesses the likely significant effects (both alone and cumulatively with other projects) that the Proposed Development may have on terrestrial biodiversity, and sets out the mitigation measures proposed to avoid, reduce or offset any potential significant effects that are identified.

Existing Environment

To inform the assessment, a comprehensive desk study and suite of field surveys have been carried out. Multidisciplinary walkover surveys were undertaken between 2023 and 2025. Habitat surveys of the Proposed Development sites covered the recognised optimum period for vegetation surveys/habitat mapping, i.e. April to September (Smith et al., 2011). Dedicated species/habitat specific surveys including for bats, otter, badger, birds, detailed botanical assessment surveys and invasive species surveys were carried out.

The multi-disciplinary walkover surveys comprehensively covered the lands within both sites that comprise the Proposed Development including Limerick Wastewater Treatment Plant and Corcanree Pump Station, and based on the survey findings, further detailed targeted surveys were carried out for features and locations of ecological significance. These surveys were carried out in accordance with TII Guidelines on Ecological Surveying Techniques for Protected Flora and Fauna on National Road Schemes (TII, 2009).

During the multidisciplinary surveys, a search for Invasive Alien Species (IAS) listed under the Third Schedule of the European Communities Regulations 2011 (S.I. 477 of 2015) was also conducted.

The habitats on the Proposed Development sites were the subject of a detailed survey and assessment and habitat mapping. This habitat mapping and assessment was undertaken following the 'A Guide to Habitats in Ireland' (Fossitt, 2000). The Limerick Wastewater Treatment Plant site is largely operational and industrial in character, dominated by treatment infrastructure, buildings, roads and hardstanding. However, a range of semi-natural habitats is also present within and around the site boundaries, including areas of wet grassland, reed and sedge swamp, and scrub within undeveloped parts of the site. Linear woodland and treelines are present along site boundaries, which provide habitat connectivity. The Corcanree Pump Station site similarly consists of operational infrastructure surrounded by managed grassland, woodland boundaries. Wet grassland is present within the footprint of the proposed stormwater tank. No rare or protected plant species were recorded within the development footprint.

Bat surveys were undertaken in 2023 and 2025 at both Limerick Wastewater Treatment Plant and Corcanree PS. The most frequently recorded species across all surveys were soprano pipistrelle and common pipistrelle, with lower levels of activity from Leisler's bat, Myotis species, and brown long eared bat. Very low levels of lesser horseshoe bat activity were recorded during the 2023 static surveys only. No existing bat roosts or potential roosting features were identified within buildings, trees, or structures that will be affected by the proposed works. Trees and habitats along site boundaries were assessed as having moderate to high value for bat commuting and foraging, particularly due to their connection with the wider river and wetland landscape.

Overall, the sites support local bat populations for commuting and foraging, but do not provide important roosting habitat.

Regular passerine bird usage of the sites was recorded, particularly by common species associated with grassland, scrub and woodland habitats. Wintering bird surveys were undertaken during the 2020/2021, 2022/2023 and 2024/2025 wintering seasons. Black headed gulls were regularly observed roosting on existing infrastructure at Limerick Wastewater Treatment Plant, typically in relatively small numbers compared to the overall River Shannon and River Fergus Estuaries Special Protected Area population and were apparently well accustomed to existing noise levels at the Plant. All of this infrastructure will be retained. Cormorants and other waterbirds listed as Special Conservation Interest (SCI) species of the Special Protected Area were recorded using Bunlicky Lake and the Shannon Estuary but were not dependent on habitats within the Proposed Development footprint. A well-known breeding cormorant colony, a designated Special Conservation Interest of the Special Protected Area, uses Bunlicky Lake for nesting, to the west of Limerick Wastewater Treatment Plant. No evidence that the footprint of the development areas is critical to the conservation of Special Protected Area or other bird populations was recorded.

No otter holts or couches were recorded during dedicated otter surveys undertaken however, otter activity was recorded in the vicinity of Bunlicky Lake, outside of the Proposed Development boundary, on multiple occasions.

Potential Impacts and Mitigation

Habitat loss associated with the Proposed Development will comprise wet grassland, reed swamp, small areas of scrub and trees within the wastewater treatment plant, amenity grassland, and an area of linear woodland at Corcanree Pump Station. The Proposed Development has been designed to avoid loss of high value habitat, including wet woodland located east of Limerick Wastewater Treatment Plant. Proposed tree loss has also been minimised where possible. The Proposed Development includes a Landscaping Plan which includes for enhancement of habitats within both Limerick Wastewater Treatment Plant and Corcanree PS, and creation of additional habitat for fauna.

The potential for disturbance effects to Key Ecological Receptors including wintering waterbirds and breeding cormorant, passerine bird species, bats and otter, as a result of construction of the Proposed Development has been considered. A range of bespoke mitigation measures to prevent disturbance have been prescribed. In addition, the potential for the operation of the Proposed Development to result in impacts on fauna including bats due to the proposed external lighting plan has also been assessed. The proposed lighting plan has been sensitively designed to avoid significant effects on wildlife.

In relation to Nationally Designated sites, the potential for the Proposed Development to result in significant effect on Fergus Estuary and Inner Shannon, South Shore proposed Natural Heritage Area (pNHA) [000435] and Fergus Estuary and Inner Shannon- North Shore pNHA [002048] has been considered. Limerick Wastewater Treatment Plant is located within the boundary of Inner Shannon Estuary - South Shore pNHA. However, as described in above sections the treatment plant is comprised of primarily industrial habitats. There is no potential for impacts on the pNHA due to habitat loss. A potential for likely significant effect on these Nationally designated sites was identified via water quality deterioration. However, a range of bespoke mitigation measures are provided in Chapter 16 (Water) to prevent impacts to water quality during construction. With the proposed mitigations in place, there is no potential for significant effects via water quality deterioration on the pNHA during construction of the Proposed Development. Furthermore, as outlined in Chapter 12 'Biodiversity (Marine)', there is no potential for significant effect as a result of operation of the Proposed Development on the marine environment.

Residual Effects

Overall, with the proposed avoidance and mitigation measures in place, there is no potential for residual significant effect on terrestrial biodiversity at any geographic scale.

In relation to European designated sites, the potential for adverse effects on Lower River Shannon and River Shannon and River Fergus Estuaries Special Protected Area has been fully assessed within the Natura Impact

Statement (NIS) that accompanies this EIAR. This report has been prepared to provide the competent authorities with the information necessary to complete an Appropriate Assessment screening and an Appropriate Assessment for the Proposed Development in compliance with Article 6(3) of the Habitats Directive. The NIS concludes that the Proposed Development, individually or in-combination with other plans or projects, will not adversely affect the integrity of any European Site.

14 Land and Soils

This section evaluates the potential effects of the Proposed Development on land and soils. It outlines the existing ground conditions, identifies potential impacts during construction and operation, and describes measures to avoid or minimise these impacts.

Existing Environment

The site is underlain by soft silts and clays, which are typically weak and compressible, overlying granular deposits and limestone bedrock at depth. Localised areas of made ground are also present.

Potential effects on land and soils include loss or damage to topsoil, construction of structures, piling activities, pollution from construction activities, and groundwater dewatering/potential contamination.

Construction Phase Impacts

During construction, impacts will be largely confined to the site footprint. Activities such as excavation, earthworks, plant movement and material storage will disturb soils and alter the existing ground profile. The removal of topsoil represents a permanent impact, as it is a non-renewable resource; however, it will be carefully managed and reused where possible, it will be used for landscaping purposes. Excavation for structures will also result in permanent changes to ground conditions within the development footprint.

Temporary impacts may arise during construction, including localised contamination from fuels, oils or concrete, and short-term changes to groundwater levels due to dewatering. These effects are expected to be limited in extent and duration. Piling works may cause localised disturbance and will result in permanent but confined.

Operational Phase Impacts

Once construction is complete, the operational phase is not expected to significantly affect land and soils. The site will include drainage, containment and management systems to control runoff and reduce the risk of contamination. Any potential for accidental leakage is considered low and will be managed through established operational procedures.

Mitigation Measures

Measures are included to reduce impacts on land and soils. These include the careful stripping, storage and reuse of topsoil, limiting excavation to necessary areas, and implementing pollution prevention measures such as bunded storage and spill response procedures. Water generated during dewatering will be treated prior to discharge, and construction activities will be monitored to ensure compliance with environmental standards.

Residual Effects

Following the implementation of these measures, residual impacts on land and soils will be minor and confined to the site. Temporary impacts will be short-term, while permanent impacts will be limited to the development footprint and will not extend beyond the site boundary.

Overall, the assessment concludes that impacts on land and soil will be localised and not significant.

15 Landscape and Visual

This Landscape and Visual Impact Assessment look at how the Proposed Development could change the local area and how it could affect what people see.

Existing Environment

Landscape effects are changes to the land and the character of the area. This includes buildings, open space, vegetation and general elements that contribute to how the area feels as a place. Visual effects are changes to views from homes, roads, footpaths, and public places. These are looked at separately so that impacts are clearly explained.

Construction Phase Impacts

During construction, temporary impacts would occur close to the site. People nearby may notice construction activity, machinery, temporary fencing, and site lighting. These effects would be short-term and would reduce once construction is finished.

Operational Phase Impacts

Once the development is complete, new buildings and structures would be present on the site. This would change the local landscape, especially within and close to the site boundary. The development may appear as a new built feature when seen from nearby locations. Further away, the overall character of the wider area would remain largely the same.

Mitigation Measures

Some existing vegetation may be removed to allow construction, which could temporarily increase visibility of the site. New planting is included as part of the project. Over time, this planting would grow and help soften the appearance of the development and better blend it into its surroundings.

People living and working closest to the site are likely to notice the greatest changes. Views from some nearby homes, roads, and walking routes may include new buildings or structures that were not there before. These changes would be more noticeable where views are open or elevated. As distance increases, views of the development become smaller and less noticeable, and in many places, views are already influenced by existing buildings and infrastructure.

At night, where lighting is required for safety or operation, the development may be more noticeable close to the site. The assessment has considered this and includes measures to limit light spill and reduce unnecessary brightness, particularly towards nearby homes and public areas.

The project design includes steps to reduce landscape and visual impacts where possible. These include careful layout of buildings, control of building height and form, retention of existing trees where feasible, and new landscaping. These measures help reduce how noticeable the development is from surrounding areas.

Residual Effects

After these measures are in place, some local changes to the landscape and views would still remain. The study concludes that landscape and visual effects would mainly be noticeable limited to a small area close to the site, and that most of the surrounding area would not experience major or widespread change.

16 Water

This chapter assesses the potential impacts of the Limerick Wastewater Treatment Plant Upgrade & Regional Bioresource Centre Project on the surface water environment, focusing on hydrology, water quality, and flood risk. The evaluation covers both the construction and operational phases, with special attention to sensitive receptors such as Bunlicky Lake, Ballinacurra Creek, and the Shannon Estuary.

Existing Environment

A comprehensive hydrodynamic and water quality modelling approach was undertaken, using field surveys and advanced numerical modelling (MIKE 3) to predict the dispersion of treated effluent in the Shannon Estuary. The assessment considered compliance with Environmental Quality Standards (EQS) and the requirements of the Water Framework Directive (WFD). Flood risk was evaluated in accordance with national planning guidelines.

The Limerick Wastewater Treatment Plant discharges treated effluent to the Shannon Estuary, which is a transitional waterbody of significant ecological and conservation value. The estuary is designated as both a Special Area of Conservation (SAC) and a Special Protection Area (SPA). Other relevant water features include Bunlicky Lake, which manages site drainage, and Ballinacurra Creek, a sensitive nearby tributary.

The Shannon Estuary is a large tidal waterbody with strong mixing due to river flows and tides. Water latest status in the area is generally moderate to poor under the Water Framework Directive (WFD) classification, and all nearby waterbodies are considered “at risk” of not meeting environmental objectives.

A Flood Risk Assessment (FRA) has been carried out for this Proposed Development in line with national guidelines. A review of available flood information, including the Shannon Catchment Flood Risk Assessment and Management Study (CFRAM), Limerick Strategic Flood Risk Assessment (SFRA), the Irish Coastal Wave and Water Level Study (ICWWS) and the national flood mapping database (www.floodmaps.ie), both sites to be at high risk of flooding in Flood Zone A. However, they benefit from existing flood defences. A precautionary approach was adopted, considering possible failure or overtopping of these defences. As the development is classified as highly vulnerable infrastructure, a Justification Test was required and has confirmed that both sites are appropriate for the proposed works.

Overall, the FRA concludes that, taking account of the need for the development, the absence of alternative suitable sites, and the proposed mitigation measures, the project will not increase flood risk either on-site or elsewhere.

Potential impacts during Construction Phase

Likely significant effects on hydrology, water quality, drainage and flooding during construction of the proposed development were assessed. A summary of the likely significant effects are as follows:

- Construction activities, especially the AGS works intersecting an existing land drain, may mobilise sediment, suspended solids, or pollutants (e.g., from excavation, earthworks, material handling, and vehicle movements). If not properly controlled, these could be transported via drains and temporarily impact water quality in Bunlicky Lake.
- Runoff from construction areas and accidental spills of fuels or chemicals could enter the drainage system, impacting nearby waterbodies if not adequately managed.
- Excavations are likely to intersect groundwater due to the site's moderate to high water table. Dewatering may be required, which can mobilise suspended solids, transport dissolved nutrients or other constituents into the drainage network, temporarily lower local groundwater levels (drawdown), and alter groundwater flow patterns.
- Activities such as piling, compaction, and heavy vehicle movements can cause localised ground vibration. In soft ground, this can mobilise fine sediments in drains or waterlogged soils, temporarily increasing turbidity if these materials enter the drainage network. These effects are expected to be short-term and localised.
- Ballinacurra Creek (approx. 200m east) has a very low to negligible risk of impact due to its distance and limited indirect connectivity. The Shannon Estuary (approx. 0.5km away) is not expected to be directly affected due to the intervening distance and the nature of the works.

Without mitigation, these could lead to short-term reductions in water quality.

Potential impacts during Operational Phase

The upgraded plant will provide improved treatment performance, particularly reducing pollutants such as organic matter and phosphorus before discharge to the estuary, and the new stormwater storage will significantly reduce uncontrolled spills. Modelling predicts that any exceedance of water quality standards will be highly localised and well within allowable limits, with no significant impact on the wider estuary or protected sites. Sustainable drainage measures (SuDS) will manage surface water runoff, and ongoing monitoring will ensure compliance.

Overall, the project is expected to result in neutral to beneficial effects on water quality compared to the current situation.

Mitigation Measures

Construction risks at the Limerick Wastewater Treatment Plant and Corcanree Pump Station will be managed through best-practice construction controls, including a Construction Environmental Management Plan, dewatering and sediment control measures, and pollution prevention protocols. The mitigation measures for the Proposed Development are comprehensive and structured for both the construction and operational phases, aimed at protecting Bunlicky Lake, Ballinacurra Creek, and the Shannon Estuary from potential adverse effects.

Cumulative Impacts and Residual Effects

The assessment also considered other planned developments and projects in the region. No significant cumulative adverse effects on water quality, hydrology, or flood risk are predicted. Instead, the development is expected to contribute positively to the water environment.

With the implementation of the mitigation and monitoring measures, the residual effects will be short term slight negative effects during the construction of the Proposed Development and significant long-term positive during operation.

With the implementation of proposed mitigation and management measures, the project will deliver long-term improvements to water quality and stormwater management in the Shannon Estuary catchment. The development aligns with national and EU water policy objectives, ensuring protection of sensitive water environments and compliance with regulatory standards.

17 Resource and Waste Management

This chapter assesses how materials and waste associated with the Proposed Development will be managed during both the construction and operational phases. The assessment has been carried out in line with national and European waste legislation and follows the waste hierarchy, which prioritises prevention, reuse and recycling of materials, with disposal as a last resort.

Existing Environment

The existing facility generates waste primarily in the form of sludge (biosolids), along with smaller quantities of general and operational waste. These waste streams are currently managed through established procedures, including treatment and reuse where possible. The existing Limerick Wastewater Treatment Plant serves a population equivalent of approximately 130,000 and treats a mix of domestic, commercial and industrial wastewater. The main waste streams generated on site include wastewater sludge, screenings and grit, along with minor operational and municipal wastes.

The primary waste produced is wastewater sludge, which is treated on site through thickening, dewatering and anaerobic digestion. This process stabilises the sludge and generates biogas, which is used on site to supply approximately 40% of the plant's energy requirements. In addition to sludge generated on site, the facility also receives imported sludge and leachate from external sources. Overall, the plant produces approximately 12,000 tonnes of dewatered sludge cake annually. This material is temporarily stored on site before being removed on a daily basis by authorised contractors. The sludge is transported to licensed facilities for further treatment,

producing a stabilised biosolid that is suitable for beneficial reuse, typically in agriculture, in accordance with regulatory requirements.

Other waste stream generated during the operational of the existing plant are: Screenings (rag) which are removed at the inlet works and comprise non-biodegradable materials, grit (sand and gravel) and municipal waste from offices.

Potential Impacts during Construction Phase

During construction, waste will mainly consist of excavated soil and stone, construction materials, vegetation, packaging, and small quantities of hazardous waste. Where possible, excavated materials will be reused on site, significantly reducing the need for disposal. Any waste that cannot be reused will be removed by authorised waste contractors and taken to appropriately licensed facilities.

With the implementation of standard construction management measures, the impact of construction waste is expected to be short term negative and not significant.

Potential Impacts during Operational Phase

During operation, the main waste stream will be sludge (biosolids) generated through wastewater treatment. The upgraded facility will include enhanced treatment processes, producing stabilised biosolids suitable for beneficial reuse, such as landspreading in accordance with national guidelines.

Other operational wastes (e.g. screenings, grit, and general waste) will be managed through established waste collection and disposal systems.

Mitigation Measures

The project also promotes resource recovery, including:

- Production of biosolids for reuse; and
- Generation of biogas for on-site energy use.

These measures support circular economy principles and reduce reliance on disposal and fossil fuels.

Municipal (non-household) office and food waste generated from the Administration Building will continue to be collected by a commercial waste collector as part of the regular waste collection service in the Limerick Area. Future volumes of municipal waste are not expected to increase as staff numbers will not change.

Mitigation measures are recommended to minimise the effect of waste on the environment, reduce the quantity of waste sent for final disposal and to promote sustainable waste management practices.

Residual Impacts

Management of waste and surplus excavation material will be at the discretion of the contractor who will be required to conform to relevant statutory requirements and the mitigation commitments made in the EIA Report. Following implementation of the mitigation measures the residual effects of the Proposed Development will be as follows:

- The residual effect of general construction waste is expected to be imperceptible and short term.
- The residual effect of operational waste is expected to be imperceptible and long term.

18 Material Assets

Likely significant effects on material assets have been evaluated during both the construction and operation of the Proposed Development. Specifically, material assets were considered in the form of:

- Land Use and Properties;
- Electricity;
- Telecommunications;

- Gas;
- Water Supply Infrastructure; and
- Foul and Surface Water Drainage

A desk study, site visits and site-specific investigations were undertaken to provide the data to compile the description of the existing material assets.

The majority of likely significant effects associated with material assets will be experienced during construction and will consist mainly of local re-routing of existing services and utilities.

All construction activities in the vicinity of existing services and utilities will be carried out in consultation with the relevant service providers and undertaken in compliance with any requirements or guidelines that they may have. The contractor will be obliged to put measures in place to ensure that there are no interruptions to existing services and utilities unless this has been agreed in advance with the relevant service provider.

During construction and operation of the Proposed Development, there will be a slight increase in demand on some service networks, such as electricity, telecommunications and water supply. However, it is anticipated that the existing networks have sufficient capacity, and therefore, no significant effects are predicted during the construction or operation phases of the Proposed Development.

The Proposed Development will provide a robust wastewater network for the Limerick agglomeration that will provide stormwater storage and accommodate future growth in the area. Therefore, there will be a significant, positive and long-term and permanent effect on the wastewater network in the operation phase of the Proposed Development.

19 Population And Human Health

This chapter assesses the likely impacts of the Proposed Development on:

- Population and demographics
- Economic activity and employment
- Social and settlement patterns
- Human health (including environmental risks)
- Recreation and amenity users

It follows EU EIA Directive requirements and EPA (2022) guidance, recognising that human health is influenced by environmental factors such as air, water, noise, traffic, and climate. A desktop review of published policy documents and data was undertaken in relation to the potential impacts arising from the construction and operational phases of the Proposed Development upon the population in the study area their health.

Existing Environment

The study area was delineated as the population catchment that could potentially be impacted based on proximity to the Proposed Development. The 'Ballinacurra, South Circular Road and Dock Road' area as defined in the Council's neighbourhood mapping was considered an appropriate area for this assessment, with the study area delineation based on an aggregation of the corresponding Central statistics Office (CSO) census data boundaries.

The assessment looked at population trends in the study area, based on CSO data from the 2016 and 2022 Census. In the 2022 Census the study area population was 18,066 (approx. 18% of Limerick City & Suburbs). It had experienced a growth rate between 2016 and 2022 of 13.9%, significantly exceeding both national and regional growth averages. Other patterns of note were the:

- High proportion of working-age population,
- Above-average student population size,
- Smaller household sizes and higher apartment share.

Future growth is expected to continue, supported by national and local planning policy, with significant housing demand projected.

In terms of economic activity, the study area forms part of a key employment corridor and includes:

- Dock Road strategic employment zone
- Shannon Foynes Port
- Industrial and commercial premises (~692 identified)

Limerick performs strongly in attracting Foreign Direct Investment (FDI), with a favourable jobs-to-worker ratio. The projected continued population growth will require commensurate additional employment capacity.

The study area exhibits a mixed-use settlement pattern, with industrial/commercial uses concentrated along Dock Road and residential and community uses to the south and east. There is strong development pressure evident in the area as indicated by recent and permitted residential schemes. The area also contains significant recreational and amenity resources, including:

- The River Shannon (SAC/SPA designation)
- Bunlicky Lake and wetlands
- Baggot Estate Nature Park
- Westfields Wetlands and local sports facilities

These contribute significantly to community wellbeing and quality of life.

Potential Impacts during Construction Phase

The potential likely and significant impact on human health have been assessed in other chapters of this report, in particular environmental factors such as air, water and soil through which contaminants could accumulate and potentially cause harm to the population. Similarly, nuisances such as odour, traffic, noise and vibrations can impact on human health. The conclusions of these chapters have informed the following section.

In the Do-Nothing Scenario if the Proposed Development were not to progress and continued growth were to occur, the existing Wastewater Treatment Plant would exceed capacity resulting in water quality deterioration in the River Shannon would deteriorate. The absence of Wastewater Treatment Plant capacity in the future would act as constraint on:

- Housing delivery
- Economic development

This scenario would result in significant long-term negative impacts on population, health, and wellbeing.

If the Proposed Development were to proceed, the construction phase should not have a significant direct impact on the population numbers within the study area, as the workforce is anticipated to commute to the site. It will generate construction (c. 80 jobs) and direct and indirect associated employment, which may not be local workers and a significant direct impact on the local employment is not anticipated. However, it is likely that local businesses will benefit from the temporary daytime presence of this workforce.

It is anticipated that there will only be potentially slight and temporary disruptions to local access, however, there are few residential receptors in the immediate vicinity of the Proposed Development. Similarly, potentially slight and temporary disruptions are envisaged to the operation of the local businesses due to construction traffic. A Traffic Management Plan will be prepared to ensure continued safe cyclists, pedestrian and vehicular access.

The potential for temporary air quality impacts to arise from construction traffic and dust emissions have been assessed as having the potential to pose a negligible to slight short-term health impact, this is comprehensively addressed by the proposed mitigation measures. Similarly, construction noise disturbance has the potential to give rise to a slight, short-term impact. However, vibration impacts are considered to be negligible.

As the proposed works are confined to within the site boundary, there should be no direct impact on community and recreational users. The existing mature vegetation should filter views of the construction site, resulting in potential for only moderate, temporary negative visual impact on the resident and working population and recreational users in close proximity to the works (less than 0.5km). Any visual impacts reduce to slight and imperceptible from distances beyond that.

Potential Impacts during Operational Phase

Once operational the Proposed Development will have knock-on impacts on human health and wellbeing. The increased capacity will support future housing and employment growth in the area, positively impacting the health and wellbeing of the community. Increased effluent flow volumes are not anticipated to impact water quality however, the proposed stormwater management improvements will result in a significant, positive impact on water quality.

These upgrades will permit the continued riverside recreational uses. Any visual impact arising from the upgrade is considered to be imperceptible. The operational Wastewater Treatment Plant is not expected to have significant negative effects in terms of air quality, odour, climate, noise, vibrations, traffic or road safety.

Chapter 20 considers the potential for operational risks to human health arising from an accident at the nearby Grassland Agro Limited Seveso site or flooding of parts of the Wastewater Treatment Plant site, resulting in contamination of ground or surface water or fire /explosion or accidental gas release. However, the Stage 3 assessment considers that the risk category of these events is low and appropriate management procedures are already in place to address these events with no additional mitigation required.

Mitigation Measures

The suite of mitigation and monitoring measures required to ensure the prevention of impacts on population and human health are included in the CEMP contained in the Volume 4, Appendix 4.1 to the EIAR.

The local residents and businesses have already been consulted about the Proposed Development. Direct impacts on these stakeholders are assessed to be minimal; however, they will be informed in advance about forthcoming construction works to minimise any potential impacts. Procedures will be put in place to ensure the successful management of construction traffic, access and parking and health and safety monitoring.

Residual Effects

Once the mitigation measures are put in place no significant impacts are expected from either the construction or operation of the Proposed Development. It is considered that this project does not have the potential to result in cumulative impacts with regards to Population and Human Health.

20 Major Accidents and Natural Disasters

This chapter assesses the vulnerability of the Proposed Development to major accidents and natural disasters during construction and operation. The assessment considers low-likelihood but potentially high-consequence events, including extreme weather, flooding, accidental pollution, utility strikes, traffic accidents, structural failure, invasive species spread, and risks associated with anaerobic digestion, biogas storage and Combined Heat and Power infrastructure.

A risk assessment was undertaken in line with EPA and IEMA guidance. The assessment considered the existing site context, including nearby COMAH (Control of Major Accident Hazards)/Seveso sites, utilities, flood risk, climate-related hazards and the proposed operational processes at the Regional Bioresource Centre.

During construction, most risks were assessed as low. Three construction-related risks were identified as requiring further mitigation: accidental release of construction debris to waterbodies, leakage or spillage of wastewater, and the spread of invasive species. These risks will be managed through the Construction Environmental Management Plan, Surface Water Management Plan, Environmental Incident Response Plan and Invasive Species Management Plan.

During operation, risks associated with fire, explosion or accidental gas release from anaerobic digestion, biogas generation, biogas storage and CHP infrastructure were assessed. These risks will be controlled through embedded design measures, compliance with relevant standards, gas detection and alarm systems, emergency shutdown procedures, operational controls, staff training, maintenance and inspection regimes.

The Proposed Development has also been designed to account for extreme weather and flood risk, including climate change allowances and surface water drainage measures. Existing and proposed management procedures will reduce risks to as low as reasonably practicable.

Following implementation of mitigation measures, no significant residual effects from major accidents or natural disasters are anticipated during either the construction or operational phases.

21 Cumulative and Interactive Effects

This chapter assesses whether the Proposed Development could give rise to cumulative effects when considered together with other existing, permitted or proposed developments, and whether interactions between different environmental topics could result in additional significant effects.

The assessment considered relevant plans and projects in the surrounding area and wider Shannon Estuary, including nearby residential, commercial and industrial developments. Limerick Co. Co. planning portal was accessed to examine planning applications in the vicinity of the site for the potential to act in combination with the Proposed Development. Some of the projects considered are:

- Limerick City and Environs Flood Relief Scheme;
- Castletroy Wastewater Treatment Plant Upgrade;
- Shannon Town Wastewater Treatment Plant Upgrade;
- Shannon Foynes Port development;
- Moneypoint Generating Station; and
- Aughinish Alumina Ltd. Expansion and Operations.

The cumulative impact assessments have been undertaken by each specialist in each relevant Chapter of this EIAR. Interactions will consider the interaction between the various environmental aspects, for example the interaction between noise and biodiversity.

During construction, there is potential for short-term cumulative effects where other works occur at the same time, particularly in relation to traffic, noise, dust, surface water quality and disturbance to biodiversity. However, these effects will be managed through standard construction controls, including the Construction Environmental Management Plan, traffic management measures, dust suppression, pollution prevention and site-specific mitigation measures, as set out throughout the Environmental Impact Assessment Report.

During operation, the Proposed Development is not expected to give rise to significant adverse cumulative effects. The upgrade will improve wastewater treatment performance and provide additional stormwater storage, reducing uncontrolled discharges and supporting improved management of wastewater and sludge.

The chapter also considers interactions between environmental topics, such as water quality and biodiversity, traffic and air quality, noise and population, and waste and climate. These interactions have been assessed within the relevant EIAR chapters, and no additional significant effects have been identified.

Overall, no significant adverse cumulative or interactive effects are predicted. The Proposed Development is expected to result in improved wastewater and stormwater management and a minor positive cumulative effect on the water environment.

22 Summary of Mitigation

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

In cases where impacts or potential impacts have been identified, mitigation has been proposed to reduce the significance of those impacts. These mitigation recommendations are contained in Chapter 22 (Summary of Mitigation Measures) within Volume 2 of the EIAR. In addition to the mitigation measures proposed, appropriate management practices and commitments relating to construction activities are also provided.

The EPA Guidelines of the Information to be contained in Environmental Impact Assessment Report, 2022 defines mitigation measures as a '*A description of the measures envisaged to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment and, where appropriate, of any proposed monitoring arrangements.*'

All potential environmental impacts associated with construction activity have been identified and assessed within the Environmental Impact Assessment Report. A Construction and Environmental Management Plan (CEMP) has been prepared and is included in Appendix 4.1, Volume 4 of the EIAR which will be updated and finalised by the Contractor prior to construction commencing. The CEMP incorporates the environmental commitments and mitigation contained in the EIAR and will be further updated to include any conditions that may be attached to a planning permission.



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