SDCC Rathcoole Housing Development

Environmental Impact Assessment Report (EIAR)
Chapter 18: Summary of Cumulative Impacts and Interactions

South Dublin County Council (SDCC)

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18 Summary of Cumulative Impacts and Interactions

18.1 Introduction

This chapter of the EIAR provides an assessment of the potential interactions and cumulative effects arising from the Proposed Development during both the construction and operational phases. The purpose of this assessment is to determine whether effects identified within the individual environmental topic EIAR chapters (Chapters 5–17) could combine (spatially, temporally or functionally) to generate greater in-combination effects than those identified when assessed in isolation or interact with those as associated with other nearby developments.

18.1.1 Legislative Context

The requirement to assess interaction and cumulative effects derives from the EU EIA Directive (2011/92/EU as amended by 2014/52/EU), which specifies that EIARs must describe:

- *"The cumulation of effects with other existing and/or approved projects*"; and
- "*The interaction between the factors referred to in points (a) to (d)*" (Article 3(1)(e)).

These requirements are transposed into Irish law through the Planning and Development Regulations, including S.I. No. 296 of 2018, which mandates that EIARs cover direct, indirect, secondary, cumulative, transboundary, short-term, medium-term, long-term, permanent and temporary, positive and negative effects of a proposed development.

18.1.2 Guidance Framework

This chapter has been prepared in accordance with:

- EPA Guidelines on the information to be contained in EIARs (EPA, 2022); and
- Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment (2018).

The EPA Guidelines (2022) emphasise the need to consider whether minor or non-significant effects could, when combined, give rise to cumulative effects that are collectively significant.

18.1.3 Assessment Methodology

This assessment draws upon:

- The predicted effects (construction and operation) from EIAR topic chapters (Chapters 5 to 17);
- Professional judgement and cross-disciplinary review; and
- A planning search and cumulative project review presented in Appendix 1-3 (Planning Search).

The cumulative assessment methodology follows a receptor-based approach consistent with EPA guidance. The assessment considers:

- Interactions: where multiple effects from the Proposed Development may act on the same receptor at the same time (e.g. noise and dust at a dwelling); and
- Cumulative effects: where effects from this Proposed Development may combine with effects from other existing, permitted or proposed developments.

18.2 Interactions

This section summarises how the environmental effects identified across the EIAR topic chapters may interact at receptors in the vicinity of the Proposed Development during the construction and operation phases. Consistent with the EPA Guidelines (2022), the focus is on whether effects acting together could give rise to greater in-combination impacts than those identified in each standalone topic chapter.

18.2.1 Construction Phase Interactions

Population and Human Health

During construction, temporary effects associated with construction traffic, noise, vibration, dust generation and general site disturbance have the potential to interact with population and human health receptors, particularly nearby residents, businesses and road users. As set out in Chapter 05 (Population and Human Health), construction-phase effects on population and human health are generally assessed across a number of separate pathways (including dust and air quality, noise and vibration, and socio-economic effects), each of which is assessed as **Not Significant** following implementation of the relevant mitigation measures (with the exception of an **Adverse, Very Significant** to **Profound**, **Short-Term** construction traffic noise effect on Link ID 8 (Mullally's Lane), which is temporary in duration and limited in extent), with the overall residual effect on population and human health during construction considered to be temporary and **Not Significant**. Key interaction pathways are as follows:

- **Material Assets (Traffic)**: construction traffic movements generate a shared pathway of noise, dust and visual disturbance for nearby residents and road users, as set out in Chapter 14 (Material Assets – Traffic).
- **Noise and Vibration**: construction noise and vibration have the potential to affect nearby residential receptors, including through changes in construction traffic flows on the local road network, as set out in Chapter 11 (Noise and Vibration).
- **Land, Soils and Geology**: exposure to dust or contaminated soils, if not properly managed, may present nuisance or low-level health risks to construction workers or nearby receptors. These impacts are managed through embedded oCEMP controls.
- **Water and Hydrology**: water quality risks (e.g. pollution incidents or sediment release) have theoretical pathways to human receptors, mitigated through the oCEMP and drainage strategy.
- **Climate**: construction GHG emissions do not directly impact human health, but climate hazards (e.g., wind, heat, heavy rainfall) can influence safety risks for workers and local receptors, addressed through safety and health controls in the CEMP.
- **Landscape and Visual**: combined visibility of construction activity with noise, dust and lighting may influence perceived amenity for nearby residents and local road corridors. These effects will be managed through good site management practices (e.g. screening, lighting controls and housekeeping measures) secured through the oCEMP, and are temporary, reducing as construction progresses.
- **Waste:** waste-related vehicle movements, dust, noise and potential contaminant exposure pathways may interact with amenity and health, managed through embedded oCEMP controls including traffic routing, dust suppression and noise control measures.
- **Major Accidents and Disasters:** emergency procedures may interact with local community receptors through temporary movement restrictions or warnings.

These interactions are therefore temporary and localised. Construction-phase interactions between population and human health and other environmental topics are assessed as **Not Significant**.

Biodiversity

Construction activities, including vegetation clearance, soil handling, drainage works, earthworks and general site disturbance, overlap with several environmental pathways relevant to biodiversity receptors. The biodiversity receptors most sensitive to these interactions include two Annex I habitats (Alluvial Woodland 91E0 and Lowland Meadow 6510, both valued at County importance), together with hedgerows/treelines, scrub, foraging/commuting bats, badger, common mammal species, and breeding birds. The loss of Annex I Alluvial Woodland and Lowland Meadow was initially assessed as a potentially Significant permanent adverse effect at County level. Following the implementation of specific mitigation

and enhancement measures, the residual effects on these habitats have been assessed as permanent adverse effects of Local significance and are therefore Not Significant in the context of the EIA. Other residual effects on important ecological features are Negligible or significant at Local level only and are also **Not Significant** in the context of the EIA.

Key interaction pathways are as follows:

- **Land, Soils and Geology**: ground disturbance, excavation and vegetation removal may interact with habitat loss and temporary disturbance to faunal species. Soil stripping and compaction can coincide with vegetation clearance, influencing habitat structure and temporary loss of foraging areas. However, all such effects are localised and controlled through construction-phase mitigation, including habitat protection measures and timing restrictions.
- **Water and Hydrology**: surface-water pathways, including potential sediment mobilisation, could interact with ecological sensitivities along the Camac and its tributaries (the Crockshane Stream and Coolmine Stream), particularly where habitats rely on water quality. Embedded SuDS, pollution control measures and construction-phase management measures are proposed to manage these interaction pathways.
- **Noise and Vibration**: construction noise may temporarily disturb species such as breeding birds, badger and foraging bats. When combined with other temporary nuisances (movement of plant, lighting, dust), these effects do not heighten impact magnitude.
- **Landscape and Visual**: vegetation removal and alterations to landform may interact with biodiversity effects, particularly where habitat connectivity is affected. These interactions are addressed through habitat retention, reinstatement, planting and other ecological mitigation measures. However, residual loss of the Annex I habitats and other habitatremains a permanent adverse effect of Local significance, as set out in Chapter 6 (Biodiversity), notwithstanding this mitigation.
- **Material Assets (Traffic)**: construction traffic contributes to localised disturbance, including noise and lighting, which may interact with biodiversity receptors. These pathways are already assessed within the biodiversity assessment.
- **Waste and Built Services**: excavation, stockpiling or works near utilities may indirectly affect habitats or faunal movement, but are controlled through the oCEMP.

These interaction pathways are localised and, in some cases (such as permanent habitat loss affecting the Annex I habitats), of a permanent nature. However, following the implementation of the mitigation measures identified in Chapter 6 (Biodiversity), residual effects are of Local significance only and are assessed as **Not Significant**, with no potential for in-combination effects beyond those identified.

Land, Soils and Geology

During Proposed Development construction, ground excavation, soil stripping, stockpiling, trenching, dewatering, and material handling have the potential to interact with other environmental factors. Anticipated interaction pathways are presented below:

- **Population and Human Health**: dust generation and the potential encounter of previously unidentified localised contamination may interact with human health receptors. These pathways are managed through the construction-phase mitigation measures.
- **Biodiversity**: soil removal and compaction can lead to habitat degradation or fragmentation, indirectly impacting flora and fauna reliant on undisturbed soils or hydrological patterns.
- **Water and Hydrology**: excavation and soil disturbance could affect surface runoff and infiltration, potentially altering hydrological regimes. Additionally, the mobilisation of potential contaminants may affect surface water and groundwater pathways.
- **Air Quality**: dust generated from earthworks and vehicle movements may contribute to short-term localised impacts on air quality.
- **Archaeology and Cultural Heritage**: groundworks required for construction could interact with previously unrecorded archaeological remains within grassed areas / greenfield areas in the red line boundary. Mitigation through pre-construction testing and archaeological monitoring will provide for the identification and appropriate management of archaeological remains encountered during the works.

- **Material Assets (Utilities)**: construction may interact with buried services or require protection/relocation of existing utilities.

These interactions are therefore temporary and localised, and, following implementation of the relevant construction-phase mitigation measures, are assessed as **Not Significant**, with no additional significant in-combination effects identified.

Water and Hydrology

Construction activities associated with earthworks, dewatering, excavation, installation of drainage infrastructure, and potential mobilisation of contaminants have the potential to interact with other environmental topics assessed in this EIAR. Main interactions include:

- **Population and Human Health**: water quality risks (e.g. pollution incidents, sediment release) have potential pathways to human receptors. These risks will be managed through the construction-phase pollution prevention and drainage control measures.
- **Biodiversity**: sediment mobilisation or a change to surface water quality has the potential to affect downstream ecological receptors. These risks are mitigated through embedded design (SuDS) and construction phase control measures.
- **Land, Soils and Geology**: excavation and stockpiling may influence soil stability, erosion risk, and the potential mobilisation of previously unidentified localised contaminants.
- **Air Quality**: dust emissions from construction activities may interact with surface water pathways through the deposition or mobilisation of fine particulates. These risks are managed through the relevant construction-phase controls.

These interactions are localised and, subject to the implementation of the mitigation measures identified in Chapter 8 (Water and Hydrology), are assessed as **Not Significant**, with no additional significant in-combination effects identified.

Air Quality

During construction, dust and exhaust emissions are the principal pathway through which air quality interacts with other environmental topics. Key interactions include:

- **Biodiversity:** dust deposition on retained vegetation and habitats adjoining the works temporarily reducing their resilience
- **Water and Hydrology**: dust from material handling may settle in nearby watercourses, managed through embedded dust and drainage mitigation.
- **Noise and Vibration**: dust-generating and noise-generating activities (earthworks, plant operation) may occur concurrently and affect the same nearby receptors.
- **Landscape and Visual**: dust generation from earthworks, material handling and construction traffic may temporarily interact with visual amenity through visible dust or dust deposition. These effects are managed through the construction dust control measures.
- **Waste**: handling, stockpiling and transport of construction materials and wastes may generate dust, which is managed through the construction dust control measures.

These interactions are temporary and localised, and following implementation of the construction dust control measures, are assessed as **Not Significant**, and do not result in additional significant impacts beyond those identified.

Climate

During construction, potential interactions arise primarily from lifecycle GHG emissions associated with , construction activities and from the vulnerability of the Proposed Development and environmental receptors to climate-related hazards (e.g., heavy rainfall, flooding, heat stress, high winds). Key interactions include:

- **Population and Human Health**: climate hazards can influence safety risks for workers and local receptors (e.g., wind, heat). Safety and health controls in the CEMP and statutory construction regulations address these risks.
- **Biodiversity**: changes in climatic conditions can influence the sensitivity of ecological receptors to effects associated with the Proposed Development. These interactions are considered through the Biodiversity assessment in Chapter 6 (Biodiversity).

- **Water and Hydrology**: climate hazards (particularly intense precipitation) may interact with construction phase runoff, erosion and accidental release pathways. These interactions are considered through the CCRA/ICCI and the Water assessment (Chapter 8, Water and Hydrology).
- **Air Quality**: construction activities will generate GHG emissions and may result in temporary dust emissions associated with earthworks, plant operation and vehicle movements. Dust mobilisation may also increase during hot, dry periods, which future climate scenarios indicate will become more frequent.
- **Material Assets (Traffic)**: construction traffic, including HGV movements and the operation of plant and equipment, contributes to the construction-phase GHG emissions assessed in Chapter 10 (Climate).
- **Waste**: the management and transport of construction materials and waste contribute to the lifecycle GHG emissions assessed in Chapter 10 (Climate).

Following implementation of the mitigation and adaptation measures identified in Chapter 10 (Climate), no Significant residual interaction effects are identified during Proposed Development construction.

Noise and Vibration

During the construction phase, there is potential for noise and vibration to interact with effects identified in other environmental topics, particularly:

- **Population and Human Health**: through temporary changes to local amenity conditions; and
- **Air Quality**: through combined dust-generating activity and construction noise.

As set out in Chapter 11 (Noise and Vibration), residual construction noise and vibration effects are assessed as Adverse, Not Significant and short-term following the implementation of mitigation measures. Residual construction traffic noise effects are Adverse, Slight and Short-Term on Road Link ID 7 (Greenogue Drive) and Adverse, Very Significant to Profound and Short-Term on Road Link ID 8 (Mullally's Lane), which is temporary and localised, affecting a limited number of noise-sensitive receptors. The interaction of these effects with other environmental topics does not give rise to additional Significant effects beyond those identified in Chapter 11 (Noise and Vibration).

Landscape and Visual

During the construction phase, temporary landscape and visual changes interact with several environmental topics:

- **Population and Human Health**: combined visibility of construction activity with noise, dust and lighting may influence perceived amenity for nearby residents and local road corridors.
- **Biodiversity**: clearance of vegetation and hedgerows has joint relevance for landscape structure and ecological connectivity. Vegetation and habitat loss may also affect landscape texture, field patterns, local screening and ecological connectivity.
- **Land, Soils and Geology**: excavation, stockpiling, and movement of materials alter local landform during construction and may create temporary visual contrasts until reinstatement.
- **Air Quality**: dust generation from earthworks and construction traffic may reduce short-range visibility and cause temporary perceptual degradation.
- **Noise and Vibration**: construction plant, piling and traffic movements occur concurrently with visible ground disturbance, cranes and lighting. Combined sensory effects may intensify the perception of construction activity for receptors with close-range views.
- **Material Assets (Traffic)**: construction traffic, material deliveries and associated vehicle movements may contribute to temporary visual disturbance along transport routes serving the Site. The movement of HGVs, temporary traffic management measures and construction access requirements may alter views experienced by road users and nearby receptors during the construction period.

While Chapter 12 (Landscape and Visual) identifies Significant and Very Significant construction-phase landscape and visual effects at some receptors, the interaction of these effects with other environmental topics does not give rise to additional Significant effects beyond those identified in the individual topic assessments.

Archaeology and Cultural Heritage

Construction works have the potential to overlap with effects assessed in other chapters, particularly where ground disturbance, traffic and temporary nuisance emissions coincide near heritage assets. The main interactions include:

- **Land and Soils**: groundworks required for construction could interact with archaeological assets where previously unrecorded remains could be present within grassed areas/greenfield areas in the Site boundary. Pre-construction archaeological testing and monitoring will allow any archaeological remains encountered to be identified and appropriately managed.
- **Noise and Vibration, and Air Quality**: temporary noise, vibration, and dust during construction could impact the setting of nearby heritage assets. As set out in Chapter 2 (Description of the Proposed Development), construction will be confined to standard working hours.

Overall, the interactions between archaeology/heritage and other environmental topics do not give rise to Significant additional effects beyond those assessed in Chapter 13 (Archaeology and Cultural Heritage).

While Chapter 13 (Archaeology and Cultural Heritage) identifies a Significant adverse residual effect on the setting of the former Paper Mill (RPS 330) and associated Mill Pond and Mill Race (RPS 332), interactions with other environmental topics do not give rise to additional Significant effects beyond those identified in the individual topic assessments.

Material Assets (Traffic)

Construction related traffic has the potential to interact with air quality, noise and vibration, land and soils, and population and human health through increased HGV movements and temporary alterations to the local road network. As set out in Chapter 14 (Material Assets (Traffic)), predicted construction traffic effects are Imperceptible and short-term and thus **Not Significant.**

Therefore, with the exception of the project-alone construction traffic noise effect on Road Link ID 8 (Mullally's Lane) identified in Chapter 11 (Noise and Vibration), the in-combination effects during construction on road users and nearby residents are assessed as **Not Significant**.

Major Accidents and Disasters (MA&D)

The potential for interactions between MA&D effects and other environmental topics is limited. The interactions are therefore narrow in scope and would arise only in the event of a major accident or disaster scenario:

- **Population and Human Health**: emergency procedures may interact with local community receptors through temporary movement restrictions or warnings.
- **Air Quality**: emergency response could temporarily increase air emissions.
- **Noise and Vibration**: emergency response (e.g. vehicles, alarms) could temporarily increase noise emissions.
- **Material Assets (Traffic)**: emergency access/egress requirements could interact with temporary construction traffic management arrangements.

These interactions are therefore temporary, localised and **Not Significant**, and do not result in additional impacts beyond those identified.

Material Assets (Utilities)

During the construction phase, temporary nuisances associated with service outages or utility works have the potential to interact with other environmental effects identified in this EIAR. These interactions include:

- **Land, Soils and Geology**: excavation works required for services interact directly with soils and ground conditions.
- **Water and Hydrology**: the installation of new utility connections and the diversion or protection of existing services interact with site drainage management. Temporary disruption to foul drainage or surface water infrastructure could affect drainage pathways during construction. These risks will be managed through construction-phase controls and coordination with the relevant service providers.
- **Archaeology and Cultural Heritage**: ground disturbance associated with installation of services may interact with archaeological remains.

- **Material Assets (Traffic)**: temporary service diversions or construction works near utilities may interact with local traffic management measures, contributing to brief delays or route adjustments.

These interactions are temporary, localised and assessed as **Not Significant** and do not result in additional impacts beyond those identified.

Waste

During construction, the following interactions may occur:

- **Population and Human Health**: waste-related vehicle movements, dust, and noise may interact with amenity and health.
- **Biodiversity**: dust deposition from soil handling and waste transport, or runoff from stockpiles, may interact with nearby habitats. These effects are limited and controlled via standard construction mitigation.
- **Land, Soils and Geology**: excavation, segregation and temporary storage of soils interact directly with soil quality, potential contamination pathways and erosion risks. These interactions are managed through the CEMP and RWMP.
- **Water and Hydrology**: mismanagement of stockpiles, excavated materials or construction waste could influence surface water and groundwater pathways. Controls within the CEMP and RWMP manage these risks.
- **Air Quality**: dust and particulate emissions may arise from handling, stockpiling and loading of excavated soils and construction waste. Vehicle movements for waste transport also contribute to short-term exhaust emissions.
- **Noise and Vibration**: waste handling activities (e.g. loading, haulage) generate localised noise. Off-site waste transport contributes to construction traffic noise.
- **Material Assets (Traffic)**: off-site transport of excavated materials and construction waste generates HGV movements, included within the construction traffic flows assessed in Chapter 14 (Material Assets – Traffic).

These interactions are temporary and localised and are assessed as **Not Significant** and do not result in additional impacts beyond those described in Chapter 17 (Waste).

18.2.2 Operational Phase Interactions

Population and Human Health

During operation, the Proposed Development will deliver 130 new residential units together with associated community, recreational and open space infrastructure. As set out in Chapter 05 (Population and Human Health), the operational phase is considered to have moderate positive effects on population and human health. Key interaction pathways are as follows:

- **Air Quality**: operational traffic-related emissions have a theoretical pathway to human receptors. As set out in Chapter 09 (Air Quality), predicted operational concentrations remain within relevant air quality standards.
- **Noise and Vibration**: operational road traffic and fixed plant noise (including the electricity substation and sports pitches) remain within acceptable limits at nearby noise-sensitive receptors, as set out in Chapter 11 (Noise and Vibration).
- **Water and Hydrology**: operational surface water drainage and SuDS measures are proposed to manage potential water quality and hydrological pathways relevant to human receptors.
- **Major Accidents and Disasters**: emergency response procedures and embedded safety management reduce the potential for effects on population and human health arising from major accidents or disasters.

Overall, the operational phase is expected to result in positive effects on population and human health through the delivery of housing, recreational facilities, open space and improved active travel connectivity, with no **Significant** adverse in-combination effects identified between population and human health and other environmental topics.

Biodiversity

During operation, the Proposed Development will introduce permanent buildings, lighting, traffic movements, recreational use and surface-water management features. Operational effects on biodiversity are Negligible or **Significant** at Local level only (i.e. **Not Significant** in the context of EIA). The main operation interactions include:

- **Land, Soils and Geology**: in the absence of active management, there is potential for further spread of invasive species (notably Japanese knotweed) within the Site, which could interact with soil disturbance from routine maintenance, controlled through the operational ISMP.
- **Water and Hydrology**: operational drainage and SuDS may interact with ecological receptors through changes to surface water quality, runoff and hydrological conditions. These pathways are addressed through the mitigation measures identified in Chapter 6 (Biodiversity) and Chapter 8 (Water and Hydrology).
- **Climate**: future changes in climatic conditions may influence the sensitivity of ecological receptors and interact with the operational effects of the Proposed Development as considered through the Biodiversity assessment in Chapter 6 (Biodiversity).
- **Noise and Vibration**: operational noise associated with traffic and other activities may interact with ecological receptors, including fauna using habitats within and adjacent to the Site.
- **Landscape and Visual**: Landscaping, habitat reinstatement, hedgerow retention and operational lighting may interact with habitat connectivity and the use of the Site by fauna. These effects are addressed through the ecological mitigation and landscaping measures.
- **Material Assets (Traffic)**: operational traffic may interact with biodiversity through noise, light emissions and disturbance affecting fauna using habitats within and adjacent to the Site.

These interactions are long-term but of minor magnitude, and are assessed as **Not Significant**, and do not result in additional impacts beyond those identified.

Land, Soils and Geology

During operation, potential interactions relate mainly to the long-term presence of the Proposed Development and ongoing maintenance activities. Key interaction pathways are as follows:

- **Water and Hydrology**: operational drainage and SuDS features may interact with soil and groundwater conditions across the Site, managed in accordance with Chapter 08 (Water and Hydrology).
- **Biodiversity**: the permanent change in land use beneath built development and landscaped areas interacts with rooting conditions and habitat structure for retained and replacement planting.
- **Landscape and Visual**: the permanent transition of the Site from woodland/greenfield to residential and amenity use interacts with soil conditions across landscaped and planted areas.
- **Material Assets (Utilities)**: the presence of below-ground utilities within the soil profile requires ongoing coordination for any future maintenance or repair works.

These operational interactions are localised and effectively managed through the operational drainage strategy and maintenance regimes described in the relevant chapters and are assessed as **Not Significant**.

Water and Hydrology

During operation, the SuDS and drainage strategy is the principal pathway through which water and hydrology interact with other environmental topics. Key interactions include:

- **Population and Human Health**: operational drainage and water quality management measures maintain water quality, avoiding any pathway of significance to human receptors.
- **Land, Soils and Geology**: operational SuDS and drainage networks interact with soil conditions and long-term hydrological regimes across the Site.
- **Biodiversity**: operational SuDS and drainage networks may interact with water quality and hydrological conditions relevant to retained aquatic and riparian habitats along the Camac and its

tributaries. These pathways are addressed through the mitigation measures identified in Chapters 6 (Biodiversity) and 8 (Water and Hydrology).

Subject to the implementation of the mitigation measures identified in Chapter 08 (Water and Hydrology), these operational interactions are assessed as **Not Significant**.

Air Quality

During operation, traffic-related emissions are the principal pathway through which air quality interacts with other environmental topics. Key interactions include:

- **Material Assets (Traffic)**: operational traffic movements are the primary source of air quality emissions during operation, as set out in Chapter 14 (Material Assets – Traffic).
- **Noise and Vibration**: operational traffic is a shared pathway for both emissions and noise, with both effects assessed in relation to the same vehicle movements.
- **Biodiversity**: operational traffic emissions have the potential to interact with ecological receptors, as considered in Chapter 6 (Biodiversity).

As set out in Chapter 09 (Air Quality), predicted operational concentrations remain within relevant air quality standards at all receptors, and the identified operational interactions do not give rise to additional **Significant** effects.

Climate

During operation, potential interactions arise primarily from lifecycle GHG emissions associated with operational activities and from the vulnerability of the Proposed Development and environmental receptors to climate-related hazards (e.g. heavy rainfall, flooding, heat stress, high winds). Key interactions include:

- **Biodiversity**: changes in climatic conditions can influence the sensitivity of ecological receptors to effects associated with the Proposed Development. These interactions are considered through the biodiversity assessment in Chapter 6 (Biodiversity).
- **Material Assets (Utilities)**: future climate hazards may interact with operational drainage and other infrastructure, requiring appropriate climate resilience and adaptation measures over the lifetime of the Proposed Development.
- **Air Quality, Water and Hydrology, Land, Soils and Geology and Archaeology and Cultural Heritage**: the In-combination Climate Change Impact (ICCI) assessment in Chapter 10 (Climate) considered the combined effect of future climate conditions and the Proposed Development on these receptors and identified potential in-combination impacts, none of which were assessed as significant.

Following implementation of the mitigation and adaptation measures identified in Chapter 10 (Climate), these operational interactions are assessed as **Not Significant**.

Noise and Vibration

During operation, road traffic and fixed plant are the principal pathways through which noise interacts with other environmental topics. Key interactions include:

- **Biodiversity**: operational noise from traffic and fixed plant (including the electricity substation and sports pitches) may interact with ecological receptors within and adjacent to the Site.
- **Material Assets (Traffic):** operational road traffic noise is directly linked to traffic volumes assessed in Chapter 14 (Material Assets – Traffic).
- **Air Quality:** operational traffic is a shared pathway for both noise and emissions, assessed in relation to the same vehicle movements.
- **Landscape and Visual**: operational noise may combine with landscape and visual change at the same receptors, particularly where receptors experience both increased activity and changes in views
- **Archaeology and Cultural Heritage**: operational noise has a theoretical pathway to the setting of nearby heritage assets.
- **Waste**: waste collection activities contribute marginally to the same operational noise profile.

As set out in Chapter 11 (Noise and Vibration), operational from the electricity substation and the sports pitches is assessed as Adverse, Not Significant and Permanent, and operational traffic noise is assessed as Adverse, Slight and Permanent along Road Link ID 7 (Greenogue Drive) and Road Link ID 8 (Mullally's

Lane). No likely significant operational noise effects are predicted, and these interactions are assessed as **Not Significant**.

Landscape and Visual

During operation, the permanent change in built form and landscape character is the principal pathway through which landscape and visual effects interact with other environmental topics. Key interactions include:

- **Biodiversity:** landscaping, habitat reinstatement and hedgerow retention support local biodiversity while also shaping landscape character and visual amenity.
- **Land, Soils and Geology**: the permanent transition from woodland/greenfield to residential and amenity use directly interacts with soil conditions across landscaped and planted areas.
- **Noise and Vibration**: perceived visual change may combine with operational noise at the same receptors, contributing to the overall experience of the Proposed Development.
- **Archaeology and Cultural Heritage**: the Proposed Development introduces a permanent change in setting for nearby heritage assets, including the former Paper Mill (RPS 330) and associated Mill Pond and Mill Race (RPS 332), through partial intervisibility.
- **Material Assets (Traffic):** the permanent presence of the Proposed Development, including roads and associated infrastructure, contributes to both visual change and traffic-related effects.

As set out in Chapter 12 (Landscape and Visual), operational landscape and visual effects on the Site and immediate surroundings are **Significant/Adverse**, while wider landscape character effects remain **Not Significant**. The interaction of these effects with other environmental topics does not give rise to additional Significant effects beyond those identified in Chapter 12 (Landscape and Visual).

Archaeology and Cultural Heritage

During operation, interactions are limited to the continuation of permanent setting effects assessed under the construction phase. Key interactions include:

- **Landscape and Visual**: the Proposed Development introduces a permanent change in setting for the former Paper Mill (RPS 330) and associated Mill Pond and Mill Race (RPS 332), due to partial intervisibility with the taller elements of the Proposed Development.
- **Material Assets (Traffic)**: operational traffic has a theoretical pathway to the setting of heritage assets through associated noise and activity, though effects are not expected to be material.
- **Noise and Vibration**: operational noise has a theoretical pathway to the setting of nearby heritage assets, though predicted levels are not expected to affect the built fabric or setting materially.

As set out in Chapter 13 (Archaeology and Cultural Heritage), a **Significant** adverse permanent effect is identified on the setting of the former Paper Mill (RPS 330) and associated Mill Pond and Mill Race (RPS 332). The interaction with other environmental topics does not give rise to additional **Significant** effects beyond this identified setting effect.

Material Assets (Traffic)

During operation, traffic movements associated with the Proposed Development are the principal pathway through which traffic interacts with other environmental topics. Key interactions include:

- **Air Quality and Noise and Vibration**: operational traffic is the shared source of both emissions and noise at the same receptors.
- **Biodiversity, Landscape and Visual and Archaeology and Cultural Heritage**: the presence of operational traffic and associated infrastructure contributes to the overall pattern of activity considered within each topic's assessment.
- **Waste**: waste collection vehicle movements form part of the assessed operational traffic flows.

As set out in Chapter 14 (Material Assets – Traffic), the effect of operational traffic on the local road network is **Imperceptible**, and these interactions are assessed as **Not Significant**.

Major Accidents and Disasters

During operation, the potential for interactions between MA&Ds and other environmental factors is substantially reduced, as the Proposed Development does not involve activities typically associated with a high risk of major accidents or disasters, and no credible operational major accident scenarios have been identified through the assessment. The assessment concludes that operational effects on population and human health, environmental receptors, material assets and biodiversity are **Not Significant**, with the only credible risk relating to an extremely unlikely external domino event associated with nearby developments. Embedded design measures, emergency response procedures and operational management controls are expected to minimise the likelihood and consequences of such events and reduce the potential for adverse synergistic, additive or cumulative interactions occurring between environmental topics. Accordingly, the in-combination operational effects associated with MA&D are assessed as **Not Significant**.

Material Assets (Utilities)

During operation, interactions are limited given that no additional mitigation measures are proposed beyond the embedded utility infrastructure and design measures described in Chapter 2 (Description of Development). Key interactions include:

- **Climate**: climate adaptation measures, including the Drainage Maintenance and operation plan Plan, interact directly with operational utilities and drainage infrastructure.
- **Land, Soils and Geology**: routine inspection and maintenance of utility infrastructure interacts with the underlying ground conditions where works are required.
- **Material Assets (Traffic), Air Quality and Noise and Vibration**: routine maintenance activity may give rise to short-term, localised interactions with traffic, emissions and noise, similar in nature to but of far lesser magnitude than construction-phase effects.
- **Waste**: any waste arising from routine maintenance activities is managed in accordance with the OWMP.

Routine inspection and maintenance of utility infrastructure will be undertaken in accordance with the requirements of the relevant service providers, and these interactions are assessed as Not Significant.

Waste

During operation, waste generation and collection is the principal pathway through which waste interacts with other environmental topics. Key interactions include:

- **Material Assets (Traffic)**: waste collection vehicle movements form part of the assessed operational traffic flows.
- **Air Quality and Noise and Vibration**: waste collection activities contribute marginally to operational emissions and noise at the same receptors.
- **Land, Soils and Geology**: inappropriate storage or handling of operational waste could result in localised effects on land or soils. These risks are managed through the OWMP.

As set out in Chapter 17 (Waste), operational waste will be managed in accordance with the waste hierarchy and the OWMP, and no likely Significant operational waste effects are expected , and these interactions are assessed as **Not Significant**.

Summary of Interactions

The interaction matrix identifies which environmental pathways have the potential to overlap. Table 18-1 shows the potential interactions between the environmental topics both for the construction and operational phases.

Table 18-1: Potential Interactions of Effects

	Traffic and Transport		Air Quality		Noise and Vibration		Land and Soils		Water and Hydrology		Biodiversity		Climate		Cultural heritage		Landscape and Visual		Waste		Built Service		MADs		Population and Human Health	
	Con	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**	**Con**	**Op**
Traffic and Transport																										
Air Quality	✓	✓																								
Noise and Vibration	✓	✓	✓	✓																						
Land and Soils	✓		✓																							
Water and Hydrology			✓				✓	✓																		
Biodiversity	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓																
Climate	✓		✓	✓				✓	✓	✓	✓	✓														
Cultural Heritage	✓	✓	✓		✓	✓	✓							✓												
Landscape and Visual	✓	✓	✓		✓	✓	✓	✓			✓	✓				✓										
Waste	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓		✓													
Built Services	✓	✓		✓		✓	✓	✓	✓		✓			✓	✓					✓						
MADs	✓		✓		✓																					
Population and Human Health	✓		✓	✓	✓	✓	✓		✓	✓			✓				✓		✓				✓	✓		

Con: Construction Phase
Op: Operational Phase

18.3 Cumulative Effects

This section presents a consolidated assessment of likely cumulative effects arising from the Proposed Development in combination with other permitted or proposed projects within the surrounding area. The list of cumulative schemes has been informed by the desk-based planning search presented in Appendix 1-3 (Planning Search) of EIAR Volume 2 and detailed within discipline chapters (Chapters 05 to 17 of EIAR Volume 1). The cumulative assessment area was defined with reference to the Zones of Influence identified within the individual environmental topic assessments. A planning search of developments within approximately 2km of the Proposed Development was undertaken and reviewed against the topic-specific Zones of Influence. Only those developments with the potential to affect the same environmental receptors as the Proposed Development were considered for detailed cumulative assessment.

18.3.1 Construction Phase Cumulative Effects

Given the location of the Proposed Development within Rathcoole and its proximity to a number of permitted and proposed developments, a number of developments may overlap temporally with the Proposed Development construction works. These include:

- Primary school development, Coolamber Drive;
- Residential scheme, Stoney Hill Road;
- Demolition of an existing dwelling and construction of residential scheme, Mill Road, Saggart;
- Muldowney's Pub redevelopment, Main Street;
- Apartment scheme, Drury Mills/Drury Park;
- Residential scheme, Newcastle Road;
- Residential dwelling development, Mill Road;
- Demolition of derelict buildings, Main Street, Rathcoole; and
- Large-scale residential development of 611 dwellings, Boherboy, Saggart.

A summary of cumulative effects by topic is provided in the following sections.

Population and Human Health

Several nearby developments identified in the planning search (including the primary school development at Coolamber Drive and residential schemes at Stoney Hill Road, Mill Road and Drury Mills/Drury Park) may overlap temporally with construction of the Proposed Development. Each scheme will be subject to applicable planning requirements, any associated environmental and regulatory requirements (where applicable), and standard construction management controls. Given the appropriate control of such potential effects, the combined effect of concurrent construction due to traffic, noise and dust on population and human health is considered temporary, localised and **Not Significant**.

Biodiversity

Construction phase lighting controls arising from construction activities associated with the Proposed Development, result in a Temporary Negligible effect of Local significance on bats, badger, breeding birds and small mammals (Irish hare, hedgehog, pygmy shrew, Irish stoat), which is **Not Significant** in the context of EIA. The primary school development (SDCC Pl. Ref. SD23A/0336 / ACP Pl. Ref. 321696) was subject toits own ecological assessment which identified ed no significant effects, alone or in-combination. No other permitted/proposed scheme overlaps with construction-phase biodiversity pathways at significant scale. Therefore, it is considered that cumulative biodiversity effects will be Minor, Adverse and Negligible and therefore **Not Significant.**

Land, Soils and Geology

Construction of the Proposed Development and other permitted or proposed developments in the surrounding area may involve concurrent earthworks, excavation and soil handling. Potential effects would be localised and managed through project-specific construction management and mitigation measures. Cumulative effects on land, soils and geology are considered to be Short-Term, Negligible and Imperceptible, which is **Not Significant**

Water and Hydrology

Although several infrastructure schemes such as the primary school development, are underway and in close proximity to the proposed Development, these projects are subject to, planning conditions and, any associated environmental and regulatory requirements (where applicable) and incorporate measures to protect the water environment. They are being constructed on lands that are subject to strict regulatory control. The Zone of Influence of each project is considered to be 1km, assuming all developments adhere to their respective CEMPs and other relevant mitigation measures. With appropriate mitigation there will be limited, if any, physical interaction with other projects. The cumulative effects on the water environment are considered to be Short-term, Negligible and Imperceptible which is **Not Significant**.

Air Quality

Two permitted planning applications lie within 250m of the Proposed Development Site, namely minor house improvements on Coolamber Drive, which will likely result in minimal dust impacts, and the primary school development, located adjacent to the Proposed Development; however, as set out in Chapter 9 (Air Quality), the construction programme of the primary school does not overlap with the construction phase of the Proposed Development and therefore no cumulative dust effects would arise. Where construction programmes of other future developments do overlap and a receptor lies within 250m of both works, there is potential for cumulative dust effects; however, assuming the other developments implement appropriate dust mitigation measures as is standard practice on all well managed construction sites, cumulative construction dust effects remain **Not Significant**.

Climate

Construction-phase GHG emissions are inherently cumulative in nature; however, consistent with Chapter 10 (Climate), project-level cumulative assessment of GHG emissions is not considered appropriate, and the construction-phase emissions of the Proposed Development have instead been assessed against national carbon budgets. On this basis, the construction-phase GHG emissions of the Proposed Development, in combination with other permitted and proposed developments such as the primary school development, are not considered material to Ireland's ability to meet its carbon reduction targets, and cumulative construction-phase climate effects are assessed as **Not Significant**.

Noise and Vibration

Chapter 11 (Noise and Vibration) identifies the potential for temporary cumulative construction noise effects with the residential schemes at Stoney Hill Road (ACP Ref. 324071, refused and under appeal) and Drury Mills/Drury Park (ACP Ref. 322539) should construction phases overlap; these can be appropriately managed through careful site management, sensitive programming and the implementation of best practicable means. Construction at Mill Road, Saggart (ACP Ref. 312501) is already underway and is unlikely to overlap with the Proposed Development. For the primary school development (SDCC Ref. SD23A/0336), a commitment has been made to coordinate the design and construction of the two developments such that no cumulative construction or operational noise impacts arise. Subject to the mitigation measures detailed in Chapter 11 (Noise and Vibration), residual construction-phase noise and vibration effects associated with the Proposed Development are predicted to be temporary and generally **Not Significant**, with the exception of an Adverse, Very Significant to Profound, Short-Term effect associated with changes in traffic flows on Link ID 8 (Mullally's Lane). A review of cumulative developments indicates that no other schemes are expected to materially contribute to or exacerbate this effect. Accordingly, the additional cumulative construction noise impact is assessed as **Not Significant**.

Landscape and Visual

Cumulative landscape and visual effects during construction would be temporary and principally related to construction activity and traffic. For most schemes, cumulative effects are unlikely due to distance, topography, vegetation or existing development. As a worst-case scenario, the adjacent primary school development (SDCC Pl. Ref. SD23A/0336 / ACP Pl. Ref. 321696) has been assessed cumulatively due to its proximity and intervisibility with the Proposed Development, resulting in a **Very Significant Adverse** cumulative effect on nearby residents and users of Rathcoole Park. However, this effect would be Temporary and Short-Term, occurring only during overlapping construction activities, and would be managed through standard construction-phase mitigation measures, including the control of construction activities, traffic and protection of retained vegetation. The permitted residential development at Mill Road, Saggart (ACP Pl. Ref. 312501), would also give rise to **Significant/Adverse**, Temporary or Short-Term cumulative effects during construction due to its proximity and intervisibility. Partial intervisibility with the residential developments at Stoney Hill Road (ACP Pl. Ref. 324071) and adjacent to Drury Mills/Drury Park

(SDCC Pl. Ref. SD24A/0092W / ACP Pl. Ref. 322539), and with the Millbrook Nursing Home extension (SDCC Pl. Ref. SD21A/0301), would result in Slight/Adverse, Temporary or Short-Term cumulative effects. All other short-listed schemes were scoped out due to their location and lack of intervisibility.

Archaeology and Cultural Heritage

Four planning applications (the primary school development on Coolamber Drive, SDCC Pl. Ref. SD23A/0336 / ACP Pl. Ref. 321696; the residential development on Stoney Hill Road, ACP Ref. 324071; the residential development of 73 units within the curtilage of the former Paper Mill (RPS 330), SDCC Ref. SD24A/0092W / ACP Ref. 322539; and demolition of derelict buildings on Main Street, SDCC Ref. SD24B/0025W / ACP Ref. 321133) within, or just outside, 500m of the Proposed Development were reviewed. If construction phases overlap, there is potential for temporary cumulative effects on heritage setting from traffic, noise and dust. Particular note is made of ACP Ref. 322539, located within the curtilage of the former Paper Mill (RPS 330); however, such effects would be temporary, limited to the construction phase and would only occur if construction works were concurrent with those of the Proposed Development. In addition, Rathcoole's assets already sit within an existing baseline of urban noise/dust, and intervisibility is limited by vegetation and existing development. Cumulative effects are considered to be **Not Significant.**

Material Assets (Traffic)

Chapter 14 (Material Assets (Traffic)) confirms that committed developments within the study area have been incorporated into the traffic assessment for both the construction and operational phases. The construction traffic associated with the Proposed Development represents a minor addition to forecast traffic volumes and, when considered cumulatively with other committed developments, is not expected to give rise to significant effects on the surrounding road network. Accordingly, cumulative construction traffic effects are assessed as Imperceptible **and Not Significant**.

Major Accidents and Disasters

In combination with other infrastructure developments (including nearby COMAH sites), the potential for domino MA&D-type events has been considered. Given the embedded safety systems of those sites and the lack of hazardous substance storage at the Proposed Development, no additional credible cumulative MA&D scenarios have been identified.

Material Assets (Utilities)

Cumulative effects of the Proposed Development on the built services and utilities of adjacent developments such as the primary school development during construction have been assessed as **Not Significant**, provided all recommended mitigations are implemented. In addition, the Proposed Development will have undergone the planning process and will implement standard and best practice mitigation measures to ensure no significant effects on material assets occur. Consultation with relevant authorities/service providers will be completed ahead of the commencement of the works to identify built services, obtain all relevant permissions/licences, and/or install new connections to services. Therefore, provided that standard best practice control and mitigation measures are implemented, cumulative effects on existing built services during the construction phase of the Proposed Development will be **Adverse**, Brief to Temporary, and **Not Significant**. Uisce Éireann has confirmed that a water connection for the Proposed Development is feasible without infrastructure upgrades to the public water network. A wastewater connection is also feasible, subject to specified network upgrades and conditions, including an approximately 200 m extension to connect to the existing sewer on Mill Road.

Waste

As set out in Chapter 17 (Waste), waste was scoped out of detailed assessment in the EIAR on the basis that the nature and scale of the Proposed Development is not expected to give rise to significant waste effects. Construction waste arisings from the Proposed Development, considered together with other permitted and proposed developments in the area, are not considered likely to give rise to significant cumulative effects on waste management infrastructure or capacity, and thus cumulative construction-phase waste effects are assessed as **Not Significant**.

18.3.2 Operational Phase Cumulative Effects

During the operational phase, the key cumulative considerations relate to:

- Traffic flows;
- Operational noise;

- Long-term habitat fragmentation;
- Ongoing drainage and water management;
- GHG emissions; and
- Effects on landscape character and heritage settings.

Population and Human Health

The Proposed Development will introduce a new residential population of approximately 385 persons to Rathcoole, a designated Self-Sustaining Growth Town. Considered alongside other permitted and planned developments in the area (including circa 1,324 permitted units within 2km and the adjacent primary school development), and having regard to the capacity of existing and planned social infrastructure, the SDCC Settlement Capacity Audit, and the significant recreational and community infrastructure delivered as part of the scheme, the cumulative effect of the Proposed Development on population and human health is assessed as Moderate, Long-Term and Positive, representing a beneficial effect. This cumulative effect reflects the combined contribution of housing delivery, recreational and open space provision, active travel connectivity, and supporting community infrastructure delivered by the Proposed Development together with the other schemes identified above, rather than a discrete environmental pathway. The most significant permitted development in the wider area is the residential scheme at Boherboy, Saggart (SDCC Ref. LRD25A/0012W / ACP Ref. 324127), granted on appeal in June 2026, which will orient principally towards services in Saggart and Citywest. The principal cumulative interaction with the Proposed Development arises at post-primary level, where both schemes fall within the catchment of Coláiste Pobail Fóla; Chapter 05 (Population and Human Health) concludes that the cumulative demand can be accommodated without significant adverse effects on social infrastructure capacity.

Biodiversity

Operational pathways relate to lighting, recreational pressure and invasive species spread. Cumulative effects with other schemes such as the primary school development are minor Adverse or Negligible thus **Not Significant** in the context of EIA. This reflects Chapter 6 (Biodiversity)'s review of nearby permitted and proposed schemes, which found no additional pathways likely to combine with those of the Proposed Development to a significant degree, given the distance and limited ecological connectivity to those sites.

Land, Soils and Geology

Once operational, the Proposed Development and other nearby developments such as the primary school development will operate in accordance with relevant legislation and embedded drainage and pollution control measures. As there are no significant ongoing excavation activities, discharges to ground, or other pathways for interaction between developments, limited, if any, physical interaction is anticipated. The cumulative effect on land, soils and geology is therefore considered Long-Term, Neutral and **Imperceptible**, which is **Not Significant.**

Water and Hydrology

The cumulative assessment considered the adjacent primary school development together with other committed residential and commercial developments identified in the planning search. These developments incorporate independent drainage infrastructure, SuDS, attenuation measures, Flood Risk Assessments and project-specific mitigation measures designed to manage surface water runoff and maintain water quality. These measures will minimise potential physical interactions with other operational and proposed developments, including the permitted primary school development (SDCC Pl. Ref. SD23A/0336). Accordingly, significant cumulative hydrological or water quality interactions are not anticipated. As a result, no shared hydrological or water quality pathway has been identified that could result in significant cumulative effects on surface water, groundwater or flood risk receptors. Accordingly, cumulative operational effects on Water and Hydrology are considered to be Long-Term, Negligible and Imperceptible, which is **Not Significant.**

Air Quality

The operational air quality assessment incorporates cumulative traffic from the adjacent primary school development within both the Do-Minimum and Do-Something scenarios (Chapter 9 -Air Quality); predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations at all receptors remain below the relevant Air Quality Limit Values, and cumulative operational air quality effects are assessed as **Not Significant.**

Climate

Greenhouse gas emissions are inherently cumulative and therefore have been considered alongside emissions associated with other committed developments in the area. However, the operational emissions associated with the Proposed Development represent a very small contribution at a national scale and have been assessed within the context of Ireland's carbon reduction targets and national carbon budgets. The review of cumulative developments did not identify any unique pathway through which the Proposed Development would combine with other developments to give rise to significant cumulative climate effects. Accordingly, cumulative operational climate effects are considered **Not Significant.**

Noise and Vibration

No likely significant cumulative operational noise or vibration effects are anticipated. Operational traffic associated with the adjacent primary school development has been included within the Do Minimum traffic scenario for the assessment of Link ID 8 (Mullally's Lane); cumulative noise from this link is predicted at 53 dB LAeq,16hr, which is lower than measured baseline levels in the vicinity of the Site. Cumulative operational noise effects are therefore **Not Significant**. **Landscape and Visual**

Relevant permitted and proposed developments have been assessed in conjunction with the Proposed Development. Most developments will result in limited cumulative effects during operation due to distance, intervening topography, vegetation and built structures, which restrict intervisibility. However, the permitted primary school development (SDCC Pl. Ref. SD23A/0336), located within and adjacent to the Site, together with nearby residential developments, will increase built form and activity within the local area, resulting in **Significant** and Adverse cumulative effects. Significant/Adverse cumulative effects are also identified in combination with the permitted residential development at Mill Road, Saggart (ACP Pl. Ref. 312501), given the proximity and intervisibility of both developments. Cumulative effects with the residential developments at Stoney Hill Road (ACP Pl. Ref. 324071) and Drury Mills/Drury Park (ACP Pl. Ref. 322539) are Slight/Adverse, and with the Millbrook Nursing Home extension (SDCC Pl. Ref. SD21A/0301) are Not Significant/Neutral. Other short-listed developments were scoped out due to their location and lack of intervisibility.

Archaeology and Cultural Heritage

As identified in Chapter 13 (Archaeology and Cultural Heritage), the Proposed Development would result in a Moderate, Permanent, Negative /Significant Adverse effect on the setting of the former Paper Mill (RPS 330) and associated Mill Pond and Mill Race (RPS 332). The planning search identified a number of nearby residential and infrastructure developments such as the proposed school development; however, these are located within an existing urban context and are not anticipated to materially increase the change in setting already identified for the Proposed Development. Accordingly, no significant cumulative operational effects on archaeology or cultural heritage receptors have been identified beyond the project-alone effect assessed in Chapter 13 (Archaeology and Cultural Heritage).

Material Assets (Traffic)

Cumulative operational traffic effects have been assessed taking account of committed developments in the locality, including the permitted primary school (SDCC Pl. Ref. SD23A/0336), residential development at Swiftbank (ABP-312501-22) and the Muldowney's Pub redevelopment (SD22A/0096). The assessment concluded that traffic associated with the primary school represents a redistribution of existing trips on the network, while trips associated with the remaining developments are negligible in the context of existing traffic volumes. It is therefore considered that cumulative operational transport effects would be Imperceptible, Long-Term and **Not Significant.**

Major Accidents and Disasters

Assuming that the mitigation measures detailed in Section 15.6 of the EIAR for the Proposed Development are implemented, no additional effects due to cumulative developments during operation are anticipated.

Material Assets (Utilities)

Effects on built services during the operational phase of the Proposed Development are predicted to be **Not Significant.** Cumulative effects on built services (water, telecommunications, gas infrastructure, and public lighting) may arise only during intermittent maintenance works and are therefore considered adverse, brief to temporary and Not Significant.

During normal operation, cumulative effects on wastewater and energy and energy infrastructure will occur in combination with existing and planned development in the Rathcoole and Saggart area. However, utility

connections and infrastructure upgrades, where required, will be delivered in consultation with the relevant service providers, and cumulative effects on built services are assessed as **Not Significant**.

Waste

Operational waste volumes are low and will not meaningfully interact with regional waste infrastructure. Cumulative operational effects are assessed as **Not Significant**.

18.4 Summary and Conclusion

This chapter has considered the potential for interaction and cumulative effects arising from the Proposed Development during both construction and operational phases, in accordance with the EIA Directive, national legislation and EPA guidance. The findings have been informed by the cross-disciplinary assessments presented throughout EIAR Chapters 05 to 17.

18.4.1 Construction Phase

Construction activities give rise to multiple concurrent environmental pathways, including traffic movements, earthworks, dust generation, temporary visual change, noise and vibration, drainage works, temporary vegetation removal and short-term changes to land use. These pathways can coincide at sensitive receptors. However:

- Whilst the majority of topic chapters conclude that residual construction effects of the Proposed Development are **Not Significant** or can be reduced to **Not Significant** through embedded or additional mitigation secured through the oCEMP and future Contractor's CEMP, a limited number of significant cumulative effects have been identified. These comprise cumulative construction-phase Landscape and Visual effects arising from intervisibility with the adjacent primary school development (SDCC Pl. Ref. SD23A/0336), which are assessed as Very Significant and Adverse and with the permitted residential development at Mill Road, Saggart (ACP Pl. Ref. 312501), which are assessed as Significant and Adverse. In addition, the assessment of the Proposed Development identifies construction traffic noise effects on Mullally's Lane (Road Link ID 8) that are Adverse, Very Significant to Profound and Short-Term; however, this represents a project-alone effect rather than a cumulative effect.
- With the exception of the residual construction-phase effects identified above (namely the Significant Adverse permanent heritage setting effect on RPS 330/332 set out in Chapter 13 (Archaeology and Cultural Heritage), the Significant/Very Significant construction-phase Landscape and Visual effects set out in Chapter 12 (Landscape and Visual), and the Adverse, Very Significant to profound, short-termconstruction traffic noise effect on Mullally's Lane set out in Chapter 11 (Noise and Vibration)), no further residual Significant construction effects capable of magnifying, compounding or intensifying effects from another topic have been identified. No chapter identifies a residual Significant construction effect, following the implementation of mitigation measures, that is capable of interacting with another environmental factor to increase the level of impact beyond those already identified above.
- Interaction pathways identified in Table 18-1 (e.g. noise–dust, traffic–air quality) do not result in greater combined effects than those assessed individually.

Cumulatively, while several surrounding developments (e.g. the primary school development at Coolamber Drive, the residential scheme at Stoney Hill Road, the residential scheme at Mill Road, and the Muldowney's Pub redevelopment) may overlap temporally with the Proposed Development, such overlaps:

- Are temporary and localised;
- Will be subject to construction-phase controls under their own planning permissions; and
- Do not combine with the Proposed Development to produce significant environmental cumulative effects, with the exception of the primary school development (SDCC Pl. Ref. SD23A/0336), which shares a boundary with the Proposed Development and the residential development at Mill Road, Saggart (ACP Pl. Ref. 312501), which is intervisible with the Proposed Development, and have the potential to give rise to **Significant** cumulative construction-phase landscape and visual effects.

The overall conclusion is that construction-phase in-combination and cumulative effects are **Not Significant**, with the exception of cumulative landscape and visual effects: a Very Significant Adverse cumulative effect arising from the combined and intervisible construction activities of the Proposed

Development and the adjacent primary school development (SDCC Pl. Ref. SD23A/0336) and a Significant Adverse effect arising from intervisibility with the permitted residential development at Mill Road, Saggart (ACP Pl. Ref. 312501).A residual construction traffic noise effect at Mullally's Lane is identified in Chapter 11 (Noise and Vibration); however, this is a direct effect of the Proposed Development itself and not an in-combination or cumulative effect.

18.4.2 Operational Phase

During Proposed Development operation, environmental pathways are substantially reduced and largely limited to:

- Traffic movements;
- Operational noise;
- Air quality;
- Landscape change;
- Surface water drainage and SuDS performance; and
- Routine maintenance activities.

Topic chapters largely conclude that operational effects associated with the Proposed Development are Imperceptible, Negligible or **Not Significant**. Two cumulative exceptions are identified. Firstly, cumulative landscape and visual effects arising from intervisibility between the Proposed Development and the adjacent primary school development (SDCC Pl. Ref. SD23A/0336) and the permitted residential development at Mill Road, Saggart (ACP Pl. Ref. 312501) are assessed as **Significant** and Adverse. Secondly, the cumulative effect on Population and Human Health, reflecting the combined contribution of housing delivery, recreational facilities, open space provision and supporting infrastructure within a planned growth settlement, is assessed as Moderate, Long-Term and Positive, representing a beneficial effect. In addition, Chapter 13 (Archaeology and Cultural Heritage) identifies a **Significant** Adverse residual effect on the setting of the former Paper Mill (RPS 330) and associated Mill Pond and Mill Race (RPS 332); however, this is a residual effect of the Proposed Development itself rather than a cumulative or in-combination effect.

Operational cumulative considerations (traffic, air quality, noise, drainage, biodiversity, and climate l) confirm:

- The magnitude of operational changes from the Proposed Development is very small relative to baseline conditions;
- Surrounding cumulative schemes do not introduce additional pathways for significant in-combination effects across these topics; and
- Long-term environmental conditions will remain within Not Significant thresholds.

Operational in-combination and cumulative effects are assessed as **Not Significant**, with two cumulative exceptions identified: a Significant Adverse cumulative landscape and visual effect arising from intervisibility with the adjacent primary school development (SDCC Pl. Ref. SD23A/0336) and the permitted residential development at Mill Road, Saggart (ACP Pl. Ref. 312501), and a moderate, long-term and positive cumulative effect on Population and Human Health. The Significant Adverse permanent heritage setting effect on RPS 330/332 (Chapter 13 – Archaeology and Cultural Heritage);is a residual effect of the Proposed Development itself and not a cumulative or in-combination effect. Chapter 12 (Landscape and Visual) also identifies project-alone operational effects that remain Significant: Significant/Adverse landscape effects within the Site at Year 1 and residual visual effects for the closest residential and recreational receptors that reduce by Year 15 but remain Significant. These are effects of the Proposed Development itself rather than cumulative or in-combination effects.

18.5 Overall Conclusions

Taking account of the interaction pathways assessed across all environmental topics, the findings of the planning search and cumulative scheme review, the embedded design measures and mitigation measures incorporated into the Proposed Development, and the outcomes of the cumulative assessment, it is concluded that the Proposed Development is not expected to give rise to significant adverse inter-

relationship effects during the construction phase. The cumulative assessment identified two significant cumulative construction-phase effects, both relating to Landscape and Visual: a Very Significant Adverse effect arising from intervisibility with the adjacent primary school development and a Significant Adverse effect in combination with the permitted residential development at Mill Road, Saggart (ACP Pl. Ref. 312501). A temporary residual construction traffic noise effect on Mullally's Lane has also been identified; however, this represents a project-alone effect and is not considered to be a cumulative or in-combination effect.

During operation, the majority of effects are predicted to remain Not Significant when considered both individually and cumulatively. The cumulative assessment identified a Significant Adverse Landscape and Visual effect arising from intervisibility with the adjacent primary school development and the permitted residential development at Mill Road, Saggart (ACP Pl. Ref. 312501), and a Moderate, Long-Term and Positive effect on Population and Human Health associated with the delivery of housing and recreational infrastructure within a planned growth settlement. Chapter 13 (Archaeology and Cultural Heritage) identifies a Significant Adverse permanent effect on the setting of the former Paper Mill (RPS 330) and associated Mill Pond and Mill Race (RPS 332). This effect relates to the Proposed Development in isolation and is not considered to represent a cumulative or in-combination effect.

Overall, no environmental receptor is predicted to experience a level of cumulative or inter-relationship effect greater than that identified within the respective topic chapters of this EIAR, other than the significant cumulative Landscape and Visual effects identified above and the Moderate, Long-Term and Positive cumulative effect on Population and Human Health.

18.6 References

Environmental Protection Agency (EPA) (2022). Guidelines on the information to be contained in Environmental Impact Assessment Reports.

European Union (2011/92/EU as amended by 2014/52/EU). Directive on the assessment of the effects of certain public and private projects on the environment.

Government of Ireland (2018). Guidelines for Planning Authorities and An Bord Pleanála on carrying out Environmental Impact Assessment.

S.I. No. 296 of 2018. European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018.