19 SUMMARY OF RESIDUAL IMPACTS

19.1 Introduction

This Chapter of the EIAR collates the predicted residual impacts on the environment as identified in Chapters 5-16, arising from the Proposed Development, during Construction and Operational Phases.

Residual Impacts, according to the EPA Guidelines (2022) are: -

> *"The final or intended effects which occur after the proposed mitigation measures have been implemented."*

A summary of the Proposed Mitigation Measures are outlined under Chapter 18: Summary of Mitigation Measures.

This chapter has been prepared by Eleanor Mac Partlin, EIAR Manager, with assistance from Niamh Robinson, EIAR Co-ordinator and Ian Doyle, EIAR Assistant, all at Stephen Little and Associates. Eleanor is the Associate Director of Stephen Little and Associates and has significant experience in the management and delivery of complex multidisciplinary projects, with particular experience in Town Planning and EIA. Niamh has 4 years' professional experience in the planning field, and holds a MRUP – Masters in Regional and Urban Planning. Ian has 2 years' professional experience in the planning field, and holds a Bachelor of Science (Honours) in Spatial Planning.

19.1.1 Population & Human Health (Chapter 5)

The residual impacts discussed below are applicable to Site 3, Site 4 and Site 5.

Construction Phase

Residual Impacts on Businesses and Residences

No mitigation is proposed regarding this factor as impacts will be positive. The construction stage, therefore, is considered to have the potential to have a **positive, slight, short term** residual impact on the economy and employment of the local and wider area.

Residual Impacts on Landscape, Amenity and Tourism

Site hoarding will be implemented to screen ground level works, however, this is not effective once buildings grow above the ground floor, or in views from elevated vantage points. As such, the residual impact on populations from landscape, amenity and tourism remains **negative, slight** to **moderate** and **short term** during the construction phase.

Residual Impacts of Land and Water Emissions on Human Health

The implementation of the mitigation measures detailed in Section 5.6.1 (and Section 7.6.2 of Chapter 7 Land, Soils and Geology, and Section 8.6.2 of Chapter 8 Water) will ensure that the potential impacts on human health and populations during the construction phase are adequately mitigated. The residual effect on human health and populations from land and water emissions during the construction phase is considered to be **neutral, imperceptible** and **short-term**.

Residual Impacts from Air Quality on Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values (set out in Directive 2008/50/EC), which are based on the protection of human health . Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is **short-term, direct, negative, localised** and **not significant**.

Residual Impacts from Noise on Human Health

The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures (outlined fully in Section 9.6.1 of Chapter 9 Air (Noise and Vibration)), will ensure that noise and vibration impact is kept to a minimum as far as practicable. Residual noise impacts during the site clearance and ground preparation phase only at NSLs adjacent to Site 3 are likely to slightly exceed the CNT, with a **short term, negative** and **moderate** to **significant** residual impact. All remaining NSLs and phases of construction works will be effectively controlled by the proposed mitigation measures, with a **short term, negative** and **not significant** residual effect. The residual effect of construction vibration is **short term, negative**, and **not significant.**

Residual Impacts from Traffic on Human Health

Provided the mitigation measures and management procedures outlined in the Construction Management Plan (CMP) and the Construction Traffic Management Plan (CTMP) are incorporated during the construction phase, the residual impact upon the local population from traffic is predicted to be **short-term** in nature and **not significant, negative** in terms of effect.

Residual Impacts from Major Accident Hazards and/or Natural Disasters on Population and Human Health

Taking into account the mitigation measures outlined in Section 5.6 it is predicted that there will be no residual impacts with regard to the construction phase major accident hazards and/or natural disasters on population and human health.

Operational Phase

Residual Impacts on Businesses and Residences

No mitigation is proposed regarding this factor as impacts will be positive. The operational stage, therefore, is considered to have the potential to have a **positive, moderate, long term** residual impact on businesses and residences of the local population.

Residual Impacts on Landscape, Amenity and Tourism

No mitigation is required regarding amenity and tourism during the operational stage due to the positive nature of the identified potential impacts.

The proposed landscaping design is considered appropriate in terms of its character, zoning and context, and will ensure the residual effect on populations from changes to landscape character will be **positive, slight** to **moderate,** and **long term.**

Residual Impacts of Land and Water Emissions on Human Health

The implementation of the mitigation measures detailed in Section 5.6.2 will ensure that the potential impacts on human health and populations once the proposed development is constructed and operational are adequately mitigated. The residual effect on human health and populations from land and water emissions during the operational stage is considered to be **neutral, imperceptible** and **long term.**

Residual Impacts from Air Quality on Human Health

Dispersion modelling of traffic emissions at sensitive receptors in proximity to impacted road links during the operational phase indicate pollutant emissions will be in compliance with the TII assessment criteria which is based on the impacts in the opening year. Therefore, residual impacts to human health related to air quality will be **long-term, localised, negative** and **imperceptible.**

Residual Impacts from Noise on Human Health

Following the implementation of the mitigation measures set out in Section 5.6.2, the predicted change in noise levels associated with additional traffic is expected to be **negative, not significant** and **long-term** along the surrounding road network. The impact from building services and plant is predicted to be **neutral, imperceptible** and **long term.**

Residual Impacts from Traffic on Human Health

As outlined in 13 Material Assets (Transportation), with the implementation of a management regime and the Mobility Management Plan, the residual effect will be **negative, not significant** and **long term.**

Residual Impacts from Major Accident Hazards and/or Natural Disasters on Population and Human Health

It is predicted that there will be no residual impacts regarding operational phase major accident hazards and/or natural disasters on population and human health.

Worst Case Impact

The precautionary principle has been applied throughout this assessment.

Cumulative

Construction Stage

In a worst-case scenario, multiple developments in the area could be developed concurrently or overlap in the construction phase and contribute to additional impacts in terms of traffic, dust, and noise.

The implementation of mitigation measures within each chapter and detailed in Section 5.6.1.; as well as the compliance of adjacent development with their respective planning permissions, will ensure there will be minimal cumulative potential for change in soil quality or the natural groundwater regime during the construction phase of the Proposed Development.

Contractors for the Proposed Development will be contractually required to operate in compliance with a project-specific CEMP and Construction Traffic Management Plan which will include the mitigation measures outlined in this EIA Report. The construction phase for the overall development of the applicant owned lands would be restricted by the same binding limits for noise, dust, and emissions to water.

According to the IAQM guidance (2024), if the construction phase of the proposed development coincides with the construction phase of any other permitted projects within 500 m of the site, there is a possibility of cumulative dust impacts occurring at any nearby sensitive receptors. Should simultaneous construction phases occur, it would lead to cumulative dust soiling and dust-related impacts on human health, specifically localised to the works area associated with the proposed works. However, provided the dust mitigation measures outlined in Section 5.6.1, are implemented throughout the construction phase of the proposed development significant cumulative dust impacts are not predicted. The predicted residual cumulative air quality impacts during the construction phase are **short-term, direct, negative,** and **slight.**

In terms of construction noise, there is potential for a temporary increase in cumulative construction noise if construction works on the three sites within the development take place concurrently, or other developments occur at the same time. Residual cumulative effects related to the construction phase, post-mitigation, are likely to be **not significant.**

The assessment of construction stage traffic outlined in Section 5.5.1.1 above incorporated traffic generated from cumulative committed developments. Th cumulative impact is therefore also **negative, not significant** and **short term.**

Operational Stage

The potential cumulative impacts of the Proposed Development during the operational phase in terms of Air Emissions, Noise generation and Traffic generation in the context of the Permitted Development have been considered in Chapter 10 Climate (Air Quality), Chapter 9 Air (Noise and Vibration) and Chapter 13 Material Assets (Transportation). The assessments indicate that the Proposed Development is not likely to result in significant adverse impacts on Human Health either alone or in combination with any likely future projects.

There is the potential for cumulative impacts to air quality during the operational phase as a result of traffic associated with other existing and permitted developments within the area. The traffic data provided for the operational stage air quality assessment included cumulative traffic associated with

existing and permitted developments in the wider area as required. The impact is predicted to be **long-term, localised, direct, negative** and **imperceptible** with regards to air quality.

With regard to operational noise, noise generated from additional traffic on the surrounding road network has the greatest potential for additional noise generation. Traffic volumes assessed in Section 5.6.2 above take account of the additional traffic from other permitted developments and therefore the traffic noise assessment presented is already assessing the cumulative impact. This assessment has concluded there will be **no significant** noise impact due to operational traffic.

The assessment of operational stage traffic outlined in Section 5.5.1.2 above incorporated traffic generated from cumulative committed developments. Th cumulative impact is therefore also **negative, not significant** and **long term.**

Worst Case Impact

The precautionary principle has been applied throughout this cumulative assessment.

19.1.2 Biodiversity (Chapter 6)

Residual ecological impacts are those that remain once the development proposals have been implemented. The main aim of ecological mitigation, remediation and enhancement is to minimise or eliminate negative residual impacts and promote positive residual impacts.

Proposed Development – Site 3

Habitats

Recolonising bare ground [High Local -> Low Local]

Following the implementation of both construction and operational stage mitigation measures, the rare and protected flora within this habitat will be relocated to new a habitat type, resulting in the devaluation of this habitat to low local ecological importance. As this habitat will be absent from the site during the operational stage, a long-term negative residual impact that is of profound significance is predicted for this low value habitat.

Reed and large sedge swamps [High Local]

The reed and large sedge swamp habitat beyond the north-eastern boundary of the western section of Site 3 is predicted to experience and neutral residual impact that is not significant.

Drainage ditches [High Local]

It is predicted that the drainage ditch habitat will undergo a long-term positive residual impact that is not significant, following the implementation of both construction and operational stage mitigation measures and short-term ecological lag (maturation of landscaped habitats).

Dry meadows and grassy verges [High Local]

Following the implementation of both construction and operational stage mitigation measures and short-term ecological lag (maturation of landscaped habitats), a long-term negative residual impact of slight significance is anticipated for the dry meadow habitats within and immediately adjacent to Site 3.

(Mixed) broadleaved woodland [High Local]

It is predicted that the mixed broadleaved woodland habitat within Site 3 will experience a long-term negative residual impact that is not significant, following the implementation of both construction and operational stage mitigation measures and medium-term ecological lag (maturation of landscaped tree-based habitats).

Mixed broadleaved / conifer woodland [High Local]

Following the implementation of both construction and operational stage mitigation measures and short-term ecological lag (maturation of landscaped habitats), a long-term negative residual impact

of that is not significant is anticipated for the mixed broadleaved / conifer woodland habitat within and immediately adjacent to Site 3's eastern boundaries.

Treelines [High Local]

Following the implementation of both construction and operational stage mitigation measures and medium-term ecological lag (maturation of landscaped tree-based habitats), a long-term neutral residual impact of that is not significant is anticipated for the treeline habitats within and immediately adjacent to Site 3.

Scrub [High Local]

It is predicted that the scrub habitats within Site 3 will experience a long-term negative residual impact that is of slight significance, following the implementation of both construction and operational stage mitigation measures and short-term ecological lag (maturation of landscaped scrub/shrub-based habitats).

Rare & Protected Flora

Pyramidal Orchid and Bee Orchid [High Local]

Following the implementation of both construction and operational stage mitigation measures and short-term ecological lag (full reestablishment of orchid populations post-relocation), a long-term neutral residual impact is anticipated for the Pyramidal Orchid and Bee Orchid populations.

Lesser Centaury [National]

Following the implementation of both construction and operational stage mitigation measures and short-term ecological lag (reestablishment of Lesser Centaury population post-relocation), a long-term neutral residual impact is anticipated for the Lesser Centaury population.

Protected Fauna

Non-volant Mammals – Badger; Pine Marten; Irish Stoat; Hedgehog; and Pygmy Shrew [High Local]

Following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats), it is predicted that a long-term negative residual impact of slight significance for local Badger, Pine Marten, Irish Stoat, Hedgehog, and Pygmy Shrew populations.

Bats [High Local]

The local bat populations are predicted to experience a long-term negative residual impact of slight significance, following the implementation of both construction and operational stage mitigation measures, and medium-term ecological lag (maturation of landscaped habitats).

Wintering Birds – Snipe [High Local]

It is predicted that the operational habitats within Site 3, even after a period of ecological lag, will not have the capacity to support the migrant wintering Snipe population that frequents the site, as well as similar wading bird species that could utilise the site. Therefore, there will experience be a long-term negative residual impact that is of slight significance for wintering bird species, despite the implementation of both construction and operational stage mitigation measures and ecological maturation of landscaped habitats.

Breeding Birds [High Local]

Following the implementation of both construction and operational stage mitigation measures, and medium-term ecological lag (maturation of landscaped tree and shrub-based habitats), it is anticipated that Site 3 breeding bird populations will experience a long-term negative residual impact that is not significant.

Amphibians [High Local]

Following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped wetland habitats), it is predicted that a long-term positive residual impact of slight significance for the local Common Frog population.

Terrestrial Invertebrates [High Local]

It is predicted that local terrestrial invertebrate populations will experience a long-term positive residual impact that is not significant, following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of a greater variety of landscaped habitats).

Summary of Residual Impacts (Site 3)

Table 6-36 (Table 19.1 below) overleaf presents an overall summary of the KERs and their respective ecological valuations; potential impacts; significance of impact in the absence of mitigations measures; prescribed mitigations measures and the significance of their residual impacts for Site 3.

Table 19-1: Summary of Site 3 KERs and their respective valuations, potential impact; significance of unmitigated impacts; required mitigations; and residual impacts

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Habitats					
Recolonising bare ground	High Local -> Low Local (following enabling works)	Construction Stage: Large-scale clearance of this habitat will result in direct physical disturbance to sensitive floral species, namely Pyramidal Orchid and Bee Orchid. Operational Stage: Habitat will be completely lost to the proposed development as it will be replaced by the residential units and associated infrastructure, as well as different operational habitat types.	Construction Stage: Long-term profound negative impact Operational Stage: Long-term negative impact of profound significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protective measures Ih detail the protection and relocation of the orchid species, as outlined in sub-section 6.8.2.6. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and	Long-term negative impact that is of profound significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Reed and large sedge swamps	High Local	Construction Stage: Degradation of flora and reduction of photosynthesis within the habitat as a result of the settlement of cement-based and general dust settlement during construction works. Operational Stage: Located beyond the northern boundary of the western section of Site 3, and as a result will not be notably impacted by site emissions (surface water, groundwater and air). Physical disturbance to and degradation of swamp flora, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.	Construction Stage: Short-term adverse impact of slight significance Operational Stage: Long-term negative impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. Operational Stage: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Drainage ditches	High Local	Construction Stage: This habitat will be completely removed from Site 3 as part of the construction clearance works. Operational Stage: Creation of new drainage ditch type habitat in form of SuDS swales. Water quality within these swales will be occasionally degraded by urban run-off, which will have knock-on impacts to flora and associated fauna. Physical disturbance to and degradation of new ditches and associated flora, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.	Construction Stage: Long-term profound negative impact Operational Stage: Long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure the safeguarding and persistence of rare and protected flora and	Long-term positive impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Dry meadow and grassy verges	High Local	<u>Construction Stage</u>: Potential loss of the Flora Protection Order species, Lesser Centaury.	<u>Construction Stage</u>: Long-term significant negative impact	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1.	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Notable loss in total habitat area as result of the physical footprint of the proposed development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Japanese Knotweed, into the retained dry meadow habitats via machinery, and site staff. <u>Operational Stage</u>: There will be large-scale removal of the majority of the dry meadow habitat; however, the extent of this loss is lessened as a result of the operational landscape design. Physical disturbance to and degradation of new meadow type habitats and their associated flora, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.	<u>Operational Stage</u>: Long-term negative impact of moderate significance	Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protective measures Ih detail the protection and relocation of the Lesser Centaury individuals, as outlined in sub-section 6.8.2.6. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>:	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
(Mixed) broadleaved woodland	High Local	<u>Construction Stage</u>: Significant habitat loss as result of the physical footprint of the proposed development. Habitat degradation for retained habitat as a result land-based impacts, i.e. physical degradation of ground flora as result of machinery or excessive footfall; compaction of soils and tree roots by machinery; and accidental breakages of tree limbs by machinery.	<u>Construction Stage</u>: Long-term significant negative impact <u>Operational Stage</u>: Long-term negative impact of moderate significance	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Habitat degradation as a result of air-based pollution events, i.e. cement dust causing the degradation of flora. Spread of invasive species, such as Japanese Knotweed, into the mixed broadleaved woodland habitat via machinery and site staff. <u>Operational Stage</u>: There will be a notable loss of the extent of the broadleaved woodland within Site 3; however, the extent is lessened somewhat, as a result of the operational landscape design and planting plan. Physical disturbance to and degradation of woodland flora, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.		site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Mixed broadleaved / conifer woodland	High Local	Construction Stage: Habitat degradation as a result land-based impacts, i.e. physical degradation of ground flora as result of machinery or excessive footfall; compaction of soils and tree roots by machinery; and accidental breakages of tree limbs by machinery. Habitat degradation as a result of air-based pollution events, i.e. cement dust causing the degradation of flora. Spread of invasive species, such as Japanese Knotweed, into the broadleaved woodland habitat via machinery and site staff. Operational Stage: Located beyond the northern boundary of the western section of Site 3, and as a result will not be notably impacted by site	Construction Stage: Short-term negative impact of slight significance Operational Stage: Long-term negative impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		emissions (surface water, groundwater and air). Physical disturbance to and degradation of woodland flora, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.		Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				protected fauna, as outlined in sub-section 6.8.5.1.	
Treelines	High Local	Construction Stage: Notable loss in total habitat area as result of the physical footprint of the proposed development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Japanese Knotweed, into the treeline habitats via machinery and site staff. Operational Stage: Treeline habitats will see an increase in their frequency within Site 3, as a result of the operational landscape design, however, the quality of the majority of the understorey flora will not replicate that of the existing treelines present on-site. A portion of the street treeline habitats will be subject to a degree or surface	Construction Stage: Long-term significant negative impact Operational Stage: Long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3.	Long-term neutral impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		water run-off as they are a part of the SuDS network. Physical disturbance to and degradation of treeline flora, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.		Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Scrub	High Local	<u>Construction Stage</u>: Notable loss in total habitat area as result of the physical footprint of the proposed development.	<u>Construction Stage</u>: Long-term significant negative impact <u>Operational Stage</u>:	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2.	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Japanese Knotweed, into the scrub habitats via machinery and site staff. <u>Operational Stage</u>: There will be permanent scrub habitat loss, however, the extent of this loss is lessened as a result of the operational landscape design. Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of shrub flora, as a result of the activities of the increased local populace.	Long-term negative impact of slight significance	Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Rare and Protected Flora					
Lesser Centaury	National	Construction Stage: Physical removal and/or regrading of supporting habitat will degrade the few individuals present, with the death of the plants being the most likely outcome, resulting in the protected population's local extinction from the site. Operational Stage: The specific dry meadow habitats, that currently support the Lesser Centaury individuals within Site 3, will not be present during the operational phase;	Construction Stage: Long-term profound negative impact Operational Stage: Long-term neutral impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the	Long-term neutral impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		however, the Lesser Centaury individuals will be relocated to a suitable habitat within Site 4, prior to site clearance.		site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protective measures Ih detail the protection and relocation of the Lesser Centaury individuals, as outlined in sub-section 6.8.2.6. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within Sites' 3 and 4 landscape planting plans, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Pyramidal Orchid Bee Orchid	High Local	<u>Construction Stage</u>: Physical removal and/or regrading of supporting habitat will degrade the individuals present, with the death of the	<u>Construction Stage</u>: Long-term very significant negative impact	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1.	Long-term neutral impact that is not significant.

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		plants being the most likely outcome, resulting in the local extinction of these orchid populations from Site 3. <u>Operational Stage</u>: The specific recolonising bare ground and dry meadow habitats, that currently support the Pyramidal and Bee Orchid populations within Site 3, will not be present during the operational phase; however, these orchid populations will be relocated, prior to site clearance, to a suitable habitat within Site 4.	<u>Operational Stage</u>: Long-term neutral impact that is not significant	Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protective measures Ih detail the protection and relocation of the orchid species, as outlined in sub-section 6.8.2.6. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within Sites' 3 and 4 landscape planting plans, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Protected Fauna					
Non-volant Mammals: Badger Pine Marten Irish Stoat Hedgehog Pygmy Shrew	High Local	Construction Stage: Degradation of supporting habitats, prey items / foraging resources and the physiological health of protected non-volant mammals as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of protected non-volant mammals commuting and foraging activities, as well as potential future resting sites (e.g. setts). Habitat loss and fragmentation of supporting terrestrial habitats. Operational Stage: Negligible to slight physical, noise and lighting disturbance to local non-volant mammal populations, when within, or in close proximity to Site 3 operations.	Construction Stage: Temporary to short-term negative impact of slight significance Operational Stage: Long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1.	Long-term negative residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 3. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and refuge habitats, the extent of which is lessened somewhat by the proposed operational landscape design. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 3.		Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Bats	High Local	Construction Stage: Loss of potential future roosting features within existing trees and structures. Degradation of supporting habitats, prey items / foraging resources and the physiological health of local bat populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Lighting and physical disturbance of the local bat populations' commuting and foraging activities. Habitat loss and fragmentation of supporting terrestrial habitats, including linear commuting features. Operational Stage: Negligible increase to collision risk mortality for bats frequenting the site. A notable increase in lighting disturbance for local bat populations, as a result of the illumination of the majority of Site 3 during operations. The fragmentation of dark commuting corridors within Site 3. Furthermore, there will be a reduced quality to all retained dark wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is	Construction Stage: Long-term negative impact of moderate significance Operational Stage: Long-term negative impact of moderate significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and refuge (potential future roosting features) habitats, the extent of which is lessened somewhat by the proposed operational landscape design.		invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Wintering Birds	High Local	<u>Construction Stage</u>: Large scale removal of suitable habitat, resulting in the loss of refuge and foraging potential for migrant wintering bird populations, including Snipe. Degradation of supporting habitats, prey items / foraging resources and the physiological health of migrant wintering birds as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended	<u>Construction Stage</u>: Long-term negative impact of moderate significance <u>Operational Stage</u>: Long-term negative impact of slight significance	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of migrant wintering bird populations' roosting, commuting and foraging activities. <u>Operational Stage</u>: Negligible to slight physical, noise and visual disturbance to migrant wintering bird populations, when within, or in close proximity to Site 3 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Permanent loss of foraging and roosting habitats, the extent of which is lessened entirely by the proximity to a new urbanised environment. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 3.		outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Breeding Birds	High Local	Construction Stage: Degradation of supporting habitats, prey items / foraging resources and the physiological health of breeding bird populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of breeding bird populations' commuting and foraging activities, as well as potential future nesting sites. Habitat loss and fragmentation of supporting terrestrial habitats, including those that provide nesting opportunities. Operational Stage: Negligible to slight physical, noise and visual disturbance to local breeding bird	Construction Stage: Temporary to long-term negative impact of moderate significance Operational Stage: Long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		populations, when within, or in close proximity to Site 3 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 3. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and nesting habitats, the extent of which is lessened somewhat by the proposed operational landscape design. Species such as Meadow Pipit and Skylark will not regain any nesting potential within the proposed development due to their requirements. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 3.		Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				protected fauna, as outlined in sub-section 6.8.5.1.	
Amphibians - Common Frog	High Local	Construction Stage: Degradation of supporting habitats, prey items and physiological health of local Common Frog populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of amphibian commuting and foraging activities. Habitat loss and fragmentation of supporting terrestrial habitats. Operational Stage: Negligible to slight physical, noise and lighting disturbance to local amphibian populations, when within, or in close proximity to Site 3 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 3. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the	Construction Stage: Long-term negative impact of moderate significance Operational Stage: Long-term negative impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4.	Long-term positive impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		case for the newly created wildlife corridors within the site. Permanent loss of foraging and hibernation habitats, the extent of which is lessened somewhat by the proposed operational landscape design. However, there will be an increase in total available spawning habitats for amphibians as result of the operational landscape design. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 3.		<u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	
Terrestrial Invertebrates	High Local	<u>Construction Stage</u>: Degradation of supporting habitats and physiological health of terrestrial invertebrate populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts).	<u>Construction Stage</u>: Temporary to short-term adverse impact of slight significance <u>Operational Stage</u>: Long-term negative impact of slight significance	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3.	Long-term positive impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Audible, visual and physical disturbance of terrestrial invertebrates commuting and foraging activities. Habitat loss and fragmentation of terrestrial habitats, which support life cycle stages of local pollinators. <u>Operational Stage</u>: Fragmentation of commuting corridor habitats within Site 3. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging, hive-building and hibernation habitats, the extent of which is lessened somewhat by the proposed operational landscape design.		The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4; as well as the site-specific invasives species mitigations outlined in sub-section 6.8.4.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5. The protective measures which detail the protection and relocation of the orchid species, as outlined in sub-section 6.8.2.6. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.4.1. Specific measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 3 landscape planting plan, as outlined in sub-section 6.8.3.1.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				The correct functional specifications and alignment of all the elements contained within the Site 3 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-section 6.8.5.1.	

Proposed Development – Site 4

Designated Sites

Grand Canal pNHA and Liffey Valley pNHA [National]

Following the implementation of both construction and operational stage mitigation measures, it is predicted that there will be a long-term neutral residual impact that is not significant for the designated sites (Grand Canal pNHA and Liffey Valley pNHA) and their respective key ecological receptors.

Habitats

Reed and large sedge swamp [High Local]

Following the implementation of both construction and operational stage mitigation measures, the reed and large sedge swamp habitat, along the banks of the Grand Canal, will experience a long-term negative impact that is not significant.

Eroding / upland rivers (Kilmahuddrick Stream) [County]

The eroding / upland rivers (Kilmahuddrick Stream) will experience a long-term negative impact that is not significant, following the implementation of both construction and operational stage mitigation measures and short-term ecological lag (maturation of the landscaped habitats).

Canals (Grand Canal) [National]

Following the implementation of both construction and operational stage mitigation measures, the aquatic canal (Grand Canal) habitat will experience a long-term neutral residual impact that is not significant for this aquatic habitat.

Drainage ditches [High Local]

It is predicted that the drainage ditch habitat will experience a long-term neutral residual impact that is not significant for this aquatic habitat, following the implementation of both construction and operational stage mitigation measures and short-term ecological lag (maturation of landscaped habitats).

Marsh [High Local]

Following the implementation of both construction and operational stage mitigation measures, and a short-term ecological lag (maturation of landscaped habitats), the wetland marsh habitat will experience a long-term positive impact of slight significance for this wetland habitat.

Dry meadow and grassy verges [High Local]

The dry meadow and grassy verges habitat will experience a long-term negative impact that is not significant, following the implementation of both construction and operational stage mitigation measures and short-term ecological lag (maturation of landscaped habitats).

(Mixed) broadleaved woodland [High Local]

Following the implementation of both construction and operational stage mitigation measures, and a medium-term ecological lag (maturation of landscaped habitats), it is predicted that the mixed broadleaved woodland habitats will experience a long-term negative impact of moderate significance.

Hedgerows [High Local]

It is predicted that the hedgerow habitats will experience a long-term positive impact of slight significance, following the implementation of both construction and operational stage mitigation measures, and medium-term ecological lag (maturation of landscaped habitats).

Treelines [High Local]

Following the implementation of both construction and operational stage mitigation measures, and medium-term ecological lag (maturation of landscaped habitats), the treelines habitat is predicted to experience a long-term negative impact of slight significance.

Wet willow-alder-ash woodland [High Local]

Following the implementation of both construction and operational stage mitigation measures, it is predicted that the wet willow-alder-ash woodland will experience a long-term negative impact that is not significant.

Scrub [High Local]

The scrub habitat is predicted to experience a long-term negative impact that is not significant, following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats).

Immature woodland [High Local]

Following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats), the immature woodland habitat is predicted to experience a long-term positive impact that is not significant.

Rare and Protected Flora

Pyramidal Orchid [High Local]

Following the implementation of both construction and operational stage mitigation measures, it is predicted that the local Pyramidal Orchid population will experience a long-term neutral impact that is not significant.

Lesser Centaury [National]

Following the implementation of both construction and operational stage mitigation measures, it is predicted that the local protected Lesser Centaury population will experience a long-term neutral impact that is not significant.

Protected Fauna

Otter [County]

Following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats), it is predicted that the local Otter population will experience a long-term negative impact that is not significant.

Non-volant Mammals – Badger; Pine Marten; Irish Stoat; Hedgehog; and Pygmy Shrew [High Local]

Following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats), it is predicted that a long-term negative residual impact of slight significance for local Badger, Pine Marten, Irish Stoat, Hedgehog, and Pygmy Shrew populations.

Bats [High Local]

It is predicted that the local bat populations will experience a long-term negative impact of slight significance, following the implementation of both construction and operational stage mitigation measures, and medium-term ecological lag (maturation of landscaped habitats).

Wintering Birds [High Local]

Following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats), it is predicted that a long-term negative residual impact of slight significance for migrant wintering bird populations.

Breeding Birds [High Local]

It is predicted that the local breeding bird populations will experience a long-term negative impact of slight significance, following the implementation of both construction and operational stage mitigation measures, and medium-term ecological lag (maturation of landscaped habitats).

Amphibians [High Local]

Following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats), it is predicted that a long-term positive residual impact of slight significance for local Common Frog and Smooth Newt populations.

Fish [County / High Local]

Following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats), it is predicted that the local and downstream fish populations will experience a long-term positive impact that is not significant.

Terrestrial Invertebrates [High Local]

It is predicted that the local terrestrial invertebrate populations will experience a long-term negative impact of slight significance, following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats).

Freshwater Aquatic Invertebrates [High Local]

Following the implementation of both construction and operational stage mitigation measures, and short-term ecological lag (maturation of landscaped habitats), it is predicted that the local freshwater aquatic invertebrate populations will experience a long-term positive impact that is not significant.

Summary of Residual Impacts (Site 4)

Table 6-37 (Table 19.2 below) presents an overall summary of the KERs and their respective ecological valuations; potential impacts; significance of impact in the absence of mitigations measures; prescribed mitigations measures and the significance of their residual impacts for Site 4.

Table 19-2: Summary of Site 4 KERs and their respective valuations, potential impact; significance of unmitigated impacts; required mitigations; and residual impacts

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Designated Sites					
Grand Canal pNHA	National	Construction Stage: Water quality, riparian and aquatic habitat degradation as a result of air and air to surface water pollution (standard and cement-based dusts). Spread of invasive species, such as Japanese Knotweed, into the northern canal bank area via disturbance of known plant locations along the southern boundary of Site 4. Physical degradation of its associated habitats along the north bank, as well the disturbance to and accidental fatalities of associated fauna. Operational Stage: Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. An increase in predator pressure on associated fauna, in particular birds, given the increased likelihood of free-roaming	Construction Stage: Significant short-term adverse impact Operational Stage: Initial long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The safeguarding mitigations measures aimed to protect fauna associated with this pNHA, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the pNHA, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the pNHA; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1.	Long-term negative residual impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		domestic cats and dogs that coincide with local population increases.		Specific measures to safeguard protected faunal species associated with the pNHA, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Liffey Valley pNHA	National	<u>Construction Stage</u>: Water quality, riparian and aquatic habitat degradation as a result of surface water, groundwater to surface water, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, cement-base dusts).	<u>Construction Stage</u>: Short-term adverse impact of moderate significance <u>Operational Stage</u>:	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response;	Long-term neutral residual impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Acidification of upstream tributaries (Kilmahuddrick Stream) through the increase in nitrogen oxides, with subsequent negative impacts on pNHA associated fish species, i.e. Lamprey and Atlantic Salmon. Spread of invasive species, such as Japanese Knotweed, downstream via the local surface water network. <u>Operational Stage</u>: No negative operational impacts are anticipated for the Liffey Valley pNHA.	Initial long-term neutral operational impact that is not significant	and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The safeguarding mitigations measures aimed to protect fauna associated with this pNHA, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the pNHA, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the pNHA; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the pNHA, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Habitats					
Reed and large sedge swamps	High Local	Construction Stage: Degradation of flora (epidermal cells) within the habitat as a result of the settlement of cement-based dusts generated during construction. Additionally, general dust settlement also has the potential to reduce photosynthesis through the physical coating of leaves. Operational Stage: Physical disturbance to and degradation of swamp flora, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.	Construction Stage: Short- term adverse impact of slight significance Operational Stage: Initial long-term negative impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the pNHA, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat;	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Eroding / upland rivers (Kilmahuddrick Stream)	County	<u>Construction Stage</u>: Water quality, riparian and aquatic habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive	<u>Construction Stage</u>: Short- term adverse impact of moderate significance	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		suspended sediments and sediment-bound nutrients, cement-base dusts). Acidification of Kilmahuddrick Stream through the increase in nitrogen oxides, with subsequent negative impacts on protected fish species, i.e. Lamprey and Atlantic Salmon, located downstream. Spread of invasive species, such as Japanese Knotweed along the banks of the stream. <u>Operational Stage</u>: Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.	<u>Operational Stage</u>: Initial long-term negative impact that is not significant	Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with this habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				Operational Stage: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Canals (Grand Canal)	National	Construction Stage: Water quality, riparian and aquatic habitat degradation as a result of air and air to surface water pollution (standard and cement-based dusts). Operational Stage: Physical, audible and visual disturbances to associated aquatic flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.	Construction Stage: Short- to medium-term adverse impact of moderate significance Operational Stage: Initial long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna	Long-term negative residual impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				associated with the pNHA, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the pNHA, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Drainage ditches	High Local	Construction Stage: Direct and permanent habitat loss of the majority of existing drainage ditches. Water quality, riparian and aquatic habitat degradation for retained drainage ditches as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Acidification of retained drainage ditches, that are connected to the Kilmahuddrick Stream, through the increase in nitrogen oxides, with subsequent negative impacts on protected fish species, i.e. Lamprey and Atlantic Salmon, located downstream. Spread of invasive species, such as Japanese Knotweed along the banks of the retained drainage ditches. Operational Stage: Drainage ditches removal during the construction stage will be replaced with new ditches in the operational site, and therefore no long-term habitat loss. New and retained drainage ditches will be subjected to physical, audible and visual disturbances to associated aquatic flora	Construction Stage: Short-term adverse impact of moderate significance Operational Stage: Initial long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3.	Long-term neutral residual impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		and fauna, as a result of the activities of the increased local populace. The drainage ditch habitats will be subjected to surface water run-off as they are a part of the SuDS network, which has the potential to degrade the water quality and instream flora in these ditches. Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of associated flora, as a result of the activities of the increased local populace.		Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Marsh	High Local	<u>Construction Stage</u>: Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora	<u>Construction Stage</u>: Short-term adverse impact of slight significance <u>Operational Stage</u>:	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response;	Long-term positive impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Japanese Knotweed, into the marsh habitat via machinery, site staff and/or fragments being washed downstream along the Kilmahuddrick Stream and into the riparian zone. <u>Operational Stage</u>: The marsh habitat will potentially be subjected to physical, audible and visual disturbances to associated wetland flora and fauna, as a result of the activities of the increased local populace. Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of marsh flora, as a result of the activities of the increased local populace.	Initial long-term negative impact that is not significant	and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protective measures which detail the protection and relocation of the rare flora, as outlined in sub-section 6.8.2.6. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				Operational Stage: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Dry meadow and grassy verges	High Local	Construction Stage: Notable loss in total habitat area as result of the physical footprint of the proposed development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts).	Construction Stage: Very significant short-term adverse impact Operational Stage: Initial long-term negative operational impact of slight significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Japanese Knotweed, into the dry meadow habitats via machinery, site staff and/or fragments being washed downstream along the Kilmahuddrick Stream and into the riparian zone. <u>Operational Stage</u>: There will be long-term dry meadow habitat loss, however, the extent of this loss is lessened as a result of the operational landscape design. Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of meadow flora, as a result of the activities of the increased local populace.		The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protective measures which detail the protection and relocation of the rare flora, as outlined in sub-section 6.8.2.6. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
(Mixed) broadleaved woodland	High Local	Construction Stage: Significant habitat loss as result of the physical footprint of the proposed development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of ground flora as result of machinery or excessive footfall; compaction of soils and	Construction Stage: Very significant short- to long-term adverse impact Operational Stage: Initial significant long-term adverse impact	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4.	Long-term negative impact of moderate significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		tree roots by machinery; and accidental breakages of tree limbs by machinery. Spread of invasive species, such as Japanese Knotweed, into the broadleaved woodland habitat via machinery and site staff. <u>Operational Stage</u>: There will be permanent and notable loss of the extent of the broadleaved woodland within Site 4, however, the extent is lessened somewhat, as a result of the operational landscape design.		The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Hedgerows	High Local	Construction Stage: Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of ground flora as result of machinery or excessive footfall; compaction of soils and tree roots by machinery; and accidental breakages of tree limbs by machinery. Spread of invasive species, such as Japanese Knotweed, into the hedgerow habitats via machinery and site staff.	Construction Stage: Short-term adverse impact of slight significance Operational Stage: Initial long-term positive impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 3, as outlined in sub-section 6.8.2.5.	Long-term positive impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Operational Stage: Hedgerow habitats will see an increase in their frequency within Site 4 as a result of the operational landscape design. Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of associated flora, as a result of the activities of the increased local populace.		The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the pNHA; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. Operational Stage: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Treelines	High Local	Construction Stage: Notable loss in total habitat area as result of the physical footprint of the proposed development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Japanese Knotweed, into the treeline habitats via machinery, site staff and/or fragments being washed downstream along the Kilmahuddrick Stream and into the riparian zone.	Construction Stage: Very significant short- to long-term adverse impact Operational Stage: Initial long-term negative impact that is of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7.	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Operational Stage: Treeline habitats will see an increase in their frequency within Site 4 as a result of the operational landscape design, however, the quality of the majority of the understorey flora will not replicate that of the existing treelines present on-site. A portion of the street treeline habitats will be subject to a degree or surface water run-off as they are a part of the SuDS network. Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of associated flora, as a result of the activities of the increased local populace.		General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. Operational Stage: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Wet willow-alder-ash woodland	High Local	Construction Stage: Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of ground flora as result of machinery or excessive footfall; compaction of soils and tree roots by machinery; and accidental breakages of tree limbs by machinery. Spread of invasive species, such as Japanese Knotweed, into the Wet willow-alder-ash woodland via machinery and site staff. Operational Stage: Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace.	Construction Stage: Short-term adverse impact of slight significance Operational Stage: Initial long-term negative impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of associated flora, as a result of the activities of the increased local populace.		Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Scrub	High Local	Construction Stage: Notable loss in total habitat area as result of the physical footprint of the proposed development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Japanese Knotweed, into the scrub habitats via machinery, site staff and/or fragments being washed downstream along the Kilmahuddrick Stream and into the riparian zone. Operational Stage: There will be permanent scrub habitat loss, however, the extent of this loss is lessened as a result of the operational landscape design.	Construction Stage: Very significant short-term adverse impact Operational Stage: Initial long-term negative operational impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The protective measures which detail the protection and relocation of the rare flora, as outlined in sub-section 6.8.2.6. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the habitat, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat;	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of associated flora, as a result of the activities of the increased local populace.		and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Immature woodland	High Local	Construction Stage: Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; compaction of soils and root systems by machinery; and accidental breakages of tree limbs by machinery. Spread of invasive species, such as Japanese Knotweed, into the immature woodland habitats via machinery, site staff and/or fragments being washed downstream along the Kilmahuddrick Stream and into the riparian zone. Operational Stage: Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.	Construction Stage: Short-term adverse impact of slight significance Operational Stage: Initial long-term positive impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the pNHA, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the pNHA; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1.	Long-term positive impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Physical disturbance to and degradation of associated flora, as a result of the activities of the increased local populace.		Specific measures to safeguard protected faunal species associated with the pNHA, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Rare and Protected Flora					

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Lesser Centaury	National	Construction Stage: Degradation of the habitat supporting Lesser Centaury, as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Physical degradation of Lesser Centaury individuals as result of stray machinery, footfall; and/or compaction of soils by machinery (during the winter period). Spread of invasive species, such as Japanese Knotweed, into habitat supporting the Lesser Centaury population via machinery, site staff and/or fragments being washed downstream along the Kilmahuddrick Stream and into the riparian zone. Operational Stage: Physical disturbance (e.g. trampling) to the Lesser Centaury population, as a result of the activities of the increased local populace. The increased potential for the introduction of invasive non-native flora and fauna to the site, as a result of the increased local populace, has the potential to have negative impacts the Lesser Centaury population (e.g.	Construction Stage: Significant short-term adverse impact Operational Stage: Initial long-term negative impact of moderate significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protective measures which detail the protection and relocation of the rare flora, as outlined in sub-section 6.8.2.6. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna associated with the pNHA, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream riparian zone; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4.	Long-term neutral impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		consumption and overshading / outcompeting)		Operational Stage: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Pyramidal Orchid	High Local	Construction Stage: Degradation of the habitat supporting Pyramidal Orchid, as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Physical degradation of Pyramidal Orchid individuals as result of stray machinery, footfall; and/or compaction of soils by machinery (during the winter period). Spread of invasive species, such as Japanese Knotweed, into habitat supporting the Pyramidal Orchid population via machinery, site staff and/or fragments being washed downstream along the Kilmahuddrick Stream and into the riparian zone.	Construction Stage: Temporary to short-term adverse impact of slight significance Operational Stage: Initial long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protective measures which detail the protection and relocation of the rare flora, as outlined in sub-section 6.8.2.6. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna	Long-term neutral impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Operational Stage: Physical disturbance (e.g. trampling) to the Pyramidal Orchid population, as a result of the activities of the increased local populace. The increased potential for the introduction of invasive non-native flora and fauna to the site, as a result of the increased local populace, has the potential to have negative impacts the Pyramidal Orchid population (e.g. consumption and overshading / outcompeting)		associated with the pNHA, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream riparian zone; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. Operational Stage: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Protected Fauna					
Otter	County	Construction Stage: Degradation of supporting habitats, prey items and Otter physiological health as a	Construction Stage: Temporary to short-	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of Otter commuting and foraging activities, as well as potential future resting sites (couches and holts). Habitat loss and fragmentation of supporting aquatic and riparian habitats. <u>Operational Stage</u>: Negligible to slight physical, noise and lighting disturbance to the local Otter population, when within, or in close proximity to Site 4 operations. The introduction of pets (dogs) to the area also has the potential to result in injuries for local Otters. Fragmentation of riparian and aquatic habitat within Site 4. Furthermore, there will be a reduced quality to the riparian corridor while the proposed landscaping is still within the ecological lag (maturation) period. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 4.	term adverse impact of moderate significance <u>Operational Stage</u>: Initial long-term negative impact of slight significance	Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The safeguarding mitigations measures aimed to protect fauna, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species associated with the habitat, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>:	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Non-volant Mammals: Badger Pine Marten Irish Stoat Hedgehog Pygmy Shrew	High Local	<u>Construction Stage</u>: Degradation of supporting habitats, prey items / foraging resources and the physiological health of protected non-volant mammals as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of protected non-volant mammals	<u>Construction Stage</u>: Temporary to short-term adverse impact of slight significance <u>Operational Stage</u>: Initial long-term negative operational impact of slight significance	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3.	Long-term negative residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		commuting and foraging activities, as well as potential future resting sites (e.g. setts). Habitat loss and fragmentation of supporting terrestrial and aquatic habitats. <u>Operational Stage</u>: Negligible to slight physical, noise and lighting disturbance to local non-volant mammal populations, when within, or in close proximity to Site 4 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 4. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and refuge habitats, the extent of which is lessened somewhat by the proposed operational landscape design. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 4.		The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Bats	High Local	Construction Stage: Loss of potential future roosting features within existing trees and structures. Degradation of supporting habitats, prey items / foraging resources and the physiological health of local bat populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Lighting and physical disturbance of the local bat populations' commuting and foraging activities.	Construction Stage: Temporary to medium-term adverse impact of moderate significance Operational Stage: Initial long-term adverse impact of moderate significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5.	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Habitat loss and fragmentation of supporting terrestrial and aquatic habitats. <u>Operational Stage</u>: Negligible increase to collision risk mortality for bats frequenting the site. A notable increase in lighting disturbance for local bat populations, as a result of the illumination of the majority of Site 4 during operations. The fragmentation of dark commuting corridors within Site 4. Furthermore, there will be a reduced quality to all retained dark wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and refuge (potential future roosting features) habitats, the extent of which is lessened somewhat by the proposed operational landscape design.		The safeguarding mitigations measures aimed to protect fauna, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Wintering Birds	High Local	Construction Stage: Degradation of supporting habitats, prey items / foraging resources and the physiological health of migrant wintering birds as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of migrant wintering bird populations' roosting, commuting and foraging activities. Habitat loss and fragmentation of supporting terrestrial and aquatic habitats. Operational Stage: Negligible to slight physical, noise and lighting disturbance to migrant wintering bird populations, when within, or in close proximity to Site 4 operations.	Construction Stage: Temporary to short-term adverse impact of slight significance Operational Stage: Initial long-term negative operational impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 4. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and roosting habitats, the extent of which is lessened somewhat by the proposed operational landscape design. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 4.		habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Breeding Birds	High Local	Construction Stage: Degradation of supporting habitats, prey items / foraging resources and the physiological health of breeding bird populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of breeding bird populations' commuting and foraging activities, as well as potential future nesting sites. Habitat loss and fragmentation of supporting terrestrial and aquatic habitats, including those that provide nesting opportunities. Operational Stage: Negligible to slight physical, noise and lighting disturbance to local breeding bird populations, when within, or in close proximity to Site 4 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 4. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed	Construction Stage: Temporary to long-term adverse impact of slight significance Operational Stage: Initial long-term negative operational impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and nesting habitats, the extent of which is lessened somewhat by the proposed operational landscape design. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 4.		invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Amphibians	High Local	<u>Construction Stage</u>: Degradation of supporting habitats, prey items and physiological health of local amphibian populations as a result of surface water, groundwater to surface water, air, and air to surface water	<u>Construction Stage</u>: Temporary to short-term adverse impact of slight significance	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2.	Long-term positive residual impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of amphibian commuting and foraging activities. Habitat loss and fragmentation of supporting aquatic and terrestrial habitats, including those which provide suitable spawning grounds. <u>Operational Stage</u>: Negligible to slight physical, noise and lighting disturbance to local amphibian populations, when within, or in close proximity to Site 4 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 4. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and hibernation habitats, the extent of which is lessened somewhat by the proposed operational landscape design. However,	<u>Operational Stage</u>: Initial long-term negative operational impact that is not significant	Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The safeguarding mitigations measures aimed to protect fauna, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		there will be an increase in total available spawning habitats for amphibians as result of the operational landscape design. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 4.		the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Fish	County High Local	Construction Stage: Degradation of supporting habitats, prey items and physiological health of local fish populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of fish commuting and foraging activities. Physical disturbance of the Kilmahuddrick Stream has the potential to result in fish fatalities. Habitat loss and fragmentation of supporting aquatic habitats as a result of	Construction Stage: Temporary to short-term adverse impacts ranging from slight (Brown Trout and Three-spined Stickleback) to moderate (Atlantic Salmon, Lamprey spp. and European Eel) significance Operational Stage: Initial long-term positive impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5.	Long-term positive impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		the development's proposed culvert installation. <u>Operational Stage</u>: Increased shading of the stream will assist in stabilising the local surface water network temperatures.		The protective measures which detail the protection and relocation of the rare flora, as outlined in sub-section 6.8.2.6. The safeguarding mitigations measures aimed to protect fauna, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Terrestrial Invertebrates	High Local	Construction Stage: Degradation of supporting habitats, prey items and physiological health of terrestrial invertebrate populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of terrestrial invertebrates commuting and foraging activities. Habitat loss and fragmentation of supporting terrestrial habitats. Operational Stage: Fragmentation of commuting corridor habitats within Site 4. Furthermore, there	Construction Stage: Temporary to short-term adverse impact of slight significance Operational Stage: Initial long-term negative operational impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The protective measures which detail the protection and relocation of the rare flora, as outlined in sub-section 6.8.2.6.	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging, hive-building and hibernation habitats, the extent of which is lessened somewhat by the proposed operational landscape design.		The safeguarding mitigations measures aimed to protect fauna associated with this pNHA, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	
Freshwater Aquatic Invertebrates	High Local	Construction Stage: Degradation of supporting habitats, prey items and physiological health of freshwater invertebrate populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of freshwater invertebrates commuting and foraging activities. Physical disturbance of the Kilmahuddrick Stream has the potential to result in freshwater invertebrate fatalities. Habitat loss and fragmentation of supporting aquatic habitats as a result of the development's proposed culvert installation. Operational Stage:	Construction Stage: Temporary to short-term adverse impact of slight significance Operational Stage: Initial long-term positive impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3.	Long-term positive impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		No negative operational impacts are anticipated. Diversity of freshwater aquatic invertebrate species will increase given the proposed pond SuDS features within the drainage and landscape operational designs.		Specific measures to protect the Kilmahuddrick Stream and fauna associated with the habitat; and to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.6.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.6.3. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.4.4. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure safe passage through the site and limit maintenance of ecological corridors, as well as the installation of remedial	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				features for rare and protected fauna, as outlined in sub-sections 6.8.7.1 and 6.8.7.2.	

Proposed Development – Site 5

Habitats

Drainage ditches [Low Local]

Following the implementation of both construction and operational stage ecological mitigation measures and short-term ecological lag (maturation of the landscaped habitats), a long-term positive residual impact, that is of slight significance is predicted for this linear wetland habitat.

Dry meadows and grassy verges [High Local]

The dry meadow and grassy verges habitat will experience a long-term negative residual impact of slight significance, following the implementation of both construction and operational stage ecological mitigation measures and short-term ecological lag (maturation of the landscaped habitats).

(Mixed) broadleaved woodland [High Local]

It is anticipated that following the implementation of both construction and operational stage ecological mitigation measures, there will be a long-term neutral residual impact that is not significant for this mixed broadleaved woodland habitat.

Mixed broadleaved / conifer woodland [High Local]

Following the implementation of both construction and operational stage ecological mitigation measures, a long-term negative residual impact that is not significant, is predicted for this mixed broadleaved / conifer woodland habitat.

Hedgerows [High Local]

The hedgerows habitat will experience a long-term positive residual impact that is not significant, following the implementation of both construction and operational stage ecological mitigation measures and medium-term ecological lag (maturation of the landscaped habitats).

Treelines [High Local]

Following the implementation of both construction and operational stage ecological mitigation measures and medium-term ecological lag (maturation of the landscaped habitats), the treelines habitat will experience a long-term positive residual impact that is of slight significance.

Scrub [High Local]

It is predicted that the scrub habitat will experience a long-term negative residual impact that is not significant, following the implementation of both construction and operational stage ecological mitigation measures and short-term ecological lag (maturation of the landscaped habitats).

Protected Fauna

Non-volant Mammals – Badger; Pine Marten; Irish Stoat; Hedgehog and Pygmy Shrew [Low – High Local]

Following the implementation of both construction and operational stage ecological mitigation measures and medium-term ecological lag (maturation of the landscaped habitats), it is anticipated that there will be a long-term negative residual impact that is not significant for the local non-volant mammal populations of Site 5.

Bats [High Local]

It is predicted that the bat populations of Site 5 will experience a long-term negative impact of slight significance, following the implementation of both construction and operational stage ecological mitigation measures and medium-term ecological lag (maturation of the landscaped habitats).

Wintering Birds [High Local]

Following the implementation of both construction and operational stage ecological mitigation measures and shot-term ecological lag (maturation of the landscaped habitats), it is anticipated that

the migrant wintering bird populations of Site 5 will experience a long-term negative residual impact that is not significant.

Breeding Birds [High Local]

The breeding bird populations of Site 5 are anticipated to experience a long-term positive impact that is not significant, following the implementation of both construction and operational stage ecological mitigation measures and medium-term ecological lag (maturation of the landscaped habitats).

Amphibians

Following the implementation of both construction and operational stage ecological mitigation measures and shot-term ecological lag (maturation of the landscaped habitats), it is anticipated that the local amphibians will experience a long-term positive residual impact that is not significant.

Terrestrial Invertebrates

It is predicted that the terrestrial invertebrate populations of Site 5 will experience a long-term positive impact of slight significance, following the implementation of both construction and operational stage ecological mitigation measures and short-term ecological lag (maturation of the landscaped habitats).

Summary of Residual Impacts (Site 5)

Table 6-38 (Table 19.3 below) overleaf presents an overall summary of the KERs and their respective ecological valuations; potential impacts; significance of impact in the absence of mitigations measures; prescribed mitigations measures and the significance of their residual impacts for Site 5.

Table 19-3: Summary of Site 5 KERs and their respective valuations, potential impact; significance of unmitigated impacts; required mitigations; and residual impacts

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Habitats					
Drainage ditches	Low Local	Construction Stage: The drainage ditch habitat will experience complete habitat loss. Operational Stage: While the existing drainage ditch will be removed during the construction stage, the habitat will be replaced with new ditch-like swales in the operational site, and therefore no long-term habitat loss. New drainage ditches will be subjected to physical, audible and visual disturbances to associated aquatic flora and fauna, as a result of the activities of the increased local populace. The drainage ditch habitats will be subjected to surface water run-off as they are a part of the SuDS network, which has the potential to degrade the water quality and instream flora in these ditches. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.	Construction Stage: Short-term negative impact of profound significance Operational Stage: Long-term positive impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of	Long-term positive impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				invasive non-native species, as outlined within sub-section 6.8.8.3. <u>Operational Stage</u>: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Dry meadow and grassy verges	High Local	<u>Construction Stage:</u> Notable loss in total habitat area as result of the physical footprint of the proposed development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts).	<u>Construction Stage:</u> Temporary to long-term negative impact of slight to moderate significance <u>Operational Stage:</u>	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Butterfly-bush, into the dry meadow habitats via machinery and site staff. <u>Operational Stage:</u> Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of meadow flora, as a result of the activities of the increased local populace.	Long-term negative impact of slight significance	response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. <u>Operational Stage</u>: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
(Mixed) broadleaved woodland	High Local	Construction Stage: Degradation of flora and reduction of photosynthesis within the habitat as a result of the settlement of cement-based and general dust settlement during construction works. Operational Stage: As the mixed broadleaved woodland is only adjacent to Site 5 and not within the site, and not accessible to the public during Site 5 operations, this woodland habitat is not anticipated to be negatively impacted by the operational stage.	Construction Stage: Short-term negative impact of slight significance Operational Stage: Long-term neutral impact that is not significant	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and	Long-term neutral impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. <u>Operational Stage</u>: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Mixed broadleaved / conifer woodland	High Local	Construction Stage: Small-scale habitat loss as result of physical footprint of the Site 5 development. Habitat degradation as a result land-based impacts, i.e. physical degradation of ground flora as result of machinery or excessive footfall; compaction of soils and tree roots by machinery; and accidental breakages of tree limbs by machinery. Habitat degradation as a result of air-based pollution events, i.e. cement dust causing the degradation of flora. Spread of invasive species, such as Butterfly-bush, into the broadleaved woodland habitat via machinery and site staff. Operational Stage: Habitat loss that will not be remedied by the proposed landscape plan, i.e., not planting of replacement mixed broadleaved and conifer woodland patch.	Construction Stage: Temporary to long-term negative impact of slight to moderate significance Operational Stage: Long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 4, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. <u>Operational Stage</u>: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Hedgerows	High Local	<u>Construction Stage:</u> Habitat loss as result of the physical footprint of the proposed development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution	<u>Construction Stage:</u> Temporary to long-term negative impact of slight significance	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence	Long-term positive impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		(deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Butterfly-bush, into the treeline habitats via machinery and site staff. <u>Operational Stage:</u> Increase in immature hedgerow habitat within the site. Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of associated flora, as a result of the activities of the increased local populace.	<u>Operational Stage:</u> Long-term neutral impact that is not significant	response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. <u>Operational Stage</u>: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Treelines	High Local	<u>Construction Stage:</u> Habitat loss as result of the physical footprint of the proposed Site 5 development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Butterfly-bush, into the treeline habitats via machinery and site staff.	<u>Construction Stage:</u> Temporary to long-term negative impact of slight significance <u>Operational Stage:</u> Long-term neutral impact that is not significant	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5.	Long-term positive impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Operational Stage: Planting of new treeline aligned habitats across the Site 5 development. Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace. Physical disturbance to and degradation of associated flora, as a result of the activities of the increased local populace.		The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. Operational Stage: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Scrub	High Local	<u>Construction Stage:</u> Notable loss in total habitat area as result of the physical footprint of the proposed development. Habitat degradation as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, and general and/or cement-base dusts). Habitat degradation as a result land-based impacts, i.e. physical degradation of flora as result of machinery or excessive footfall; and compaction of soils by machinery. Spread of invasive species, such as Butterfly-bush, into the scrub habitats via machinery and site staff. <u>Operational Stage:</u> Physical, audible and visual disturbances to associated flora and fauna, as a result of the activities of the increased local populace. Increased potential for introduction of invasive non-native flora and fauna as a result of the increased local populace.	<u>Construction Stage:</u> Short to long-term negative impact of slight to moderate significance <u>Operational Stage:</u>	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Physical disturbance to and degradation of associated flora, as a result of the activities of the increased local populace.		Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. <u>Operational Stage</u>: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Protected Fauna					
Non-volant Mammals**:**	Low – High Local	<u>Construction Stage</u>: Degradation of supporting habitats, prey items / foraging resources and the	<u>Construction Stage:</u>	<u>Construction Stage</u>:	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
Badger Pine Marten Irish Stoat Hedgehog Pygmy Shrew		physiological health of protected non-volant mammals as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of protected non-volant mammals commuting and foraging activities, as well as potential future resting sites (e.g. setts). Habitat loss and fragmentation of supporting terrestrial habitats. <u>Operational Stage</u>: Negligible to slight physical, noise and lighting disturbance to local non-volant mammal populations, when within, or in close proximity to Site 5 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 5. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site.	Temporary to short-term negative impact of slight significance <u>Operational Stage:</u> Long-term negative impact of slight significance	Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Permanent loss of foraging and refuge habitats, the extent of which is lessened somewhat by the proposed operational landscape design. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 5.		Operational Stage: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Bats	High Local	Construction Stage: Loss of potential future roosting features within existing trees and structures. Degradation of supporting habitats, prey items / foraging resources and the physiological health of local bat populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended	Construction Stage: Temporary to medium-term negative impact of moderate significance Operational Stage: Long-term negative impact of moderate significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3.	Long-term negative impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		sediments and sediment-bound nutrients, and cement-base dusts). Lighting and physical disturbance of the local bat populations' commuting and foraging activities. Habitat loss and fragmentation of supporting terrestrial habitats, including linear commuting features. <u>Operational Stage</u>: Negligible increase to collision risk mortality for bats frequenting the site. A notable increase in lighting disturbance for local bat populations, as a result of the illumination of the majority of Site 5 during operations. The fragmentation of dark commuting corridors within Site 5. Furthermore, there will be a reduced quality to all retained dark wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and refuge (potential future roosting features) habitats, the extent of which is lessened somewhat by the proposed operational landscape design.		The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. <u>Operational Stage</u>: The completion of all remedial planting within the Site 4 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				the Site 4 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Wintering Birds	High Local	<u>Construction Stage</u>: Large scale removal of suitable habitat, resulting in the loss of refuge and foraging potential for migrant wintering bird populations, including Snipe. Degradation of supporting habitats, prey items / foraging resources and the physiological health of migrant wintering birds as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of migrant wintering bird populations' roosting, commuting and foraging activities.	<u>Construction Stage:</u> Temporary to short-term negative impact of slight significance <u>Operational Stage:</u> Long-term negative impact of slight significance	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7.	Long-term negative impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Operational Stage: Negligible to slight physical, noise and visual disturbance to migrant wintering bird populations, when within, or in close proximity to Site 5 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Permanent loss of foraging and roosting habitats, the extent of which is lessened entirely by the proximity to a new urbanised environment. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 5.		General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. Operational Stage: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Breeding Birds	High Local	Construction Stage: Degradation of supporting habitats, prey items / foraging resources and the physiological health of breeding bird populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of breeding bird populations' commuting and foraging activities, as well as potential future nesting sites. Habitat loss and fragmentation of supporting terrestrial habitats, including those that provide nesting opportunities. Operational Stage: Negligible to slight physical, noise and visual disturbance to local breeding bird populations, when within, or in close proximity to Site 3 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 5. Furthermore, there will be a reduced quality to all retained	Construction Stage: Temporary to long-term negative impacts of slight significance Operational Stage: Long-term negative impact of slight significance	Construction Stage: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2.	Long-term positive impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and nesting habitats, the extent of which is lessened somewhat by the proposed operational landscape design. Increased risk in road collision mortality as result of the operational vehicular traffic of Site 5.		Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. <u>Operational Stage</u>: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Amphibians: Common Frog	Low Local	<u>Construction Stage</u>: Degradation of supporting habitats, prey items and physiological health of local Common Frog populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and	<u>Construction Stage:</u> Temporary to short-term negative impact of slight significance <u>Operational Stage:</u>	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence	Long-term positive impact that is not significant

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of amphibian commuting and foraging activities. Habitat loss and fragmentation of supporting terrestrial habitats. <u>Operational Stage</u>: Negligible to slight physical, noise and lighting disturbance to local amphibian populations, when within, or in close proximity to Site 3 operations. The introduction of pets to the area also has the potential to result in predation injuries and fatalities. Fragmentation of commuting corridor habitats within Site 5. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging and hibernation habitats, the extent of which is lessened somewhat by the proposed operational landscape design. However, there will be an increase in total available spawning habitats for amphibians as result of the operational landscape design.	Long-term negative impact that is not significant	response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5. The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. <u>Operational Stage</u>: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1.	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Increased risk in road collision mortality as result of the operational vehicular traffic of Site 5.		The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	
Terrestrial Invertebrates	High Local	<u>Construction Stage</u>: Degradation of supporting habitats and physiological health of terrestrial invertebrate populations as a result of surface water, groundwater to surface water, air, and air to surface water pollution (deleterious substances, excessive suspended sediments and sediment-bound nutrients, and cement-base dusts). Audible, visual and physical disturbance of terrestrial invertebrates commuting and foraging activities. Habitat loss and fragmentation of terrestrial habitats, which support life cycle stages of local pollinators.	<u>Construction Stage:</u> Temporary to short-term negative impact of slight significance <u>Operational Stage:</u> Long-term negative impact of slight significance	<u>Construction Stage</u>: Standard environmental best practice guidance as outlined in sub-section 6.8.2.1. Environmental management procedures for site compounds as outlined in sub-section 6.8.2.2. Mitigation measures within the surface water management; environmental incidence response; and dust management plans, as outlined in sub-section 6.8.2.3. The detailed mitigation measures provided within the invasive species management plan, as outlined within sub-section 6.8.2.4. The protection measures for retained trees within and immediately adjacent to Site 5, as outlined in sub-section 6.8.2.5.	Long-term positive impact of slight significance

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
		Operational Stage: Fragmentation of commuting corridor habitats within Site 5. Furthermore, there will be a reduced quality to all retained wildlife corridors while the proposed landscaping is still within the ecological lag (maturation) period. This is also the case for the newly created wildlife corridors within the site. Permanent loss of foraging, hive-building and hibernation habitats, the extent of which is lessened somewhat by the proposed operational landscape design.		The safeguarding mitigations measures aimed to protect fauna associated with this habitat, as outlined in sub-section 6.8.2.7. General measures to ensure the safeguarding and persistence of rare and protected flora and fauna, as outlined in sub-sections 6.8.4.2 and 6.8.4.3. Specific measures to ensure enacting of ecologically-minded habitat seed bank (genetic) preservation during clearance, as outlined in sub-section 6.8.8.1. Specific measures to safeguard protected faunal species, as outlined in sub-section 6.8.8.2. Specific mitigation measures to control / management the spread and extermination of invasive non-native species, as outlined within sub-section 6.8.8.3. Operational Stage: The completion of all remedial planting within the Site 5 landscape planting plan, as outlined in sub-section 6.8.3.1. The correct functional specifications and alignment of all the elements contained within the Site 5 drainage (SuDS) and lighting designs, as outlined in sub-section 6.8.3.2 and 6.8.3.3. The protection of vulnerable fauna through ecological guidance of operational maintenance of dense vegetation and piles of vegetative debris, as outlined sub-section 6.8.3.4. Guidance measures in respect to the re-use of cleared tree limbs, during the initial operational	

Key Ecological Receptors	Ecological Valuation	Potential Impacts	Significance of Impact without Mitigation	Mitigation Measures	Significance of Residual Impacts
				stage, for the benefit of local fauna, as outlined within sub-section 6.8.3.5. Specific measures to secure the installation of remedial features for rare and protected fauna, as outlined in sub-sections 6.8.9.1.	

19.1.3 Land, Soils and Geology (Chapter 7)

The proposed developments will alter the current land use from a somewhat vacant greenfield site to new residential, community and private open space, creche and landscaped areas. The impact on land, soil, geology, and hydrogeology from accidental spillages of fuel and lubricants used during the construction phase of the developments is predicted to be minimal when stored and used in a responsible manner. After implementation of the mitigation measures recommended above for the construction phase, the proposed developments will not give rise to any significant long term adverse impact.

Implementation of the measures outlined in Section 7.6 will ensure that the potential impacts of the development on soils and the geological environment are minimised during the construction phase and that any residual impacts will be short term and imperceptible.

Residual impacts from earthworks haulage and the risk of contamination of groundwater are deemed to be minor. The residual impacts for a residential housing development, creche and open space are deemed to be imperceptible post construction (during the operational phase).

Implementation of the mitigation measures outlined above will ensure that potential significant effects of the proposed development on land, soils and geology do not occur during the construction phase and that any residual effects will be short term and not significant.

Receptor	Potential Effect	Quality of Effects	Magnitude of Effect	Significance of Effects (post mitigation)
Soils/Subsoils	Chemical Pollution of soils/subsoils	Negative	Low / Negligible: Implementation of best practice measures to control hazardous substances mitigates effect. Measures include controls on use and storage of hazardous materials, controls on construction works.	Not Significant
Limestone Bedrock	Chemical Pollution of bedrock	Negative	Low / Negligible: Implementation of best practice measures to control hazardous substances mitigates effect. Measures include controls on use and storage of hazardous materials, controls on construction works.	Not Significant
Soils/Subsoils	Loss of soil value	Negative	Low / Negligible: Implementation of best practice measures to protect soil value mitigates effect. Measures include best practice soil handling and construction practices and reinstatement of affected areas.	Not Significant
Soils/Subsoils	Material Generation	Negative	Low / Negligible: Implementation of best practice measures for material generation mitigates effect. Measures include optimisation of site levels, reuse of materials and use of local quarries/waste receivers.	Not Significant
Limestone Bedrock	Material Generation	Negative	Low / Negligible: Implementation of best practice measures for material generation mitigates effect. Measures include optimisation of road levels, reuse of materials and use of local quarries/waste receivers.	Not Significant

Table 19-4 Significance (Construction Phase Post Mitigation)

Receptor	Potential Effect	Quality of Effects	Magnitude of Effect	Significance of Effects (post mitigation)
Soils/Subsoils	Loss of soil value	Negative	Low / Negligible: Implementation of best practice measures to protect soil value mitigates effect. Measures include design and construction of detailed earthworks and landscaping proposals.	Not Significant
Soils/Subsoils	Pollution of soils/subsoils	Negative	Low / Negligible: Implementation of best practice measures to control chemical pollution mitigates effect. Measures include testing of drainage networks, oil interceptors and sustainable urban drainage systems.	Not Significant

Table 19-5 Significance (Operational Phase Post Mitigation)

Construction Phase ("Worst-Case Scenario")

Under a worst-case scenario, the accidental release of fuel, oil, paints or hazardous material occurs on site during the construction phase, through the failure of secondary containment or a materials handling accident on all sites. If this were to occur over open ground, then these materials could infiltrate through the soil contaminating the soil zone. If the materials were not recovered promptly, then the contaminants could contaminate the down gradient groundwater and surface water receptors causing a significant contamination event.

If the materials were not recovered promptly, then the contaminants could contaminate the down gradient groundwater and surface water receptors, and the ground water could become poisonous, undrinkable and unusable for general agricultural methods. The impacts from such an accident would be negative and long-term. Given the likely small quantity in any spillage, the effects would be localised and imperceptible.

The contactor must adhere to the CEMP to ensure that all containment is kept in working order which should result in this worst-case scenario being unlikely to occur.

Operational Phase ("Worst-Case Scenario")

As noted, from an operational viewpoint, the worst-case scenario would be an accidental spill of oils from cars or effluent from a leak in the foul drainage system or damage to the oil separator serving the roads for the proposed scheme.

The worst-case impact relates to the potential for oil or effluent entering the ground. There is a potential risk for local residents to encounter the contaminated ground. Due to the expected low volume of oil run-off, this impact would be negative, short term and imperceptible. However, the mitigation measures outlined above in Section 7.6.2 should ensure that this does not occur.

Under a worst-case scenario, soil slippage due to poorly constructed earthworks causes ground instability in the surrounding areas. If this were to occur, the surrounding lands could become unstable, adversely affecting any potential future development in the area. The mitigation measures outlined above in Section 7.6.3 should ensure no such scenario occurs.

19.1.4 Water (Chapter 8)

Impact on Climate

It is considered that by implementing the proposed construction and operational stage mitigation measures above, the significance of the identified impacts will be reduced to a "Not Significant" residual impact on the identified hydrological/hydrogeological receptors.

Construction Stage

Under a "worst case" scenario, the accidental release of fuel, oil, paints or other hazardous material occurs on site during the construction stage, through the failure of secondary contaminant or a materials handling accident on the site. If this were to occur over open ground, then these materials could infiltrate through the soil contaminating the groundwater or flow overland and contaminate surface water receptors.

Operational Stage

"Worst case" scenarios envisioned are extreme occurrences of the potential effects identified above in conjunction with failure of mitigation measures during the operational stage including:

- Significant contamination event.
- Flooding due to extreme event or unsuitable drainage measures.

Considering the relatively standard nature of the works involved, the likelihood of a "worst case" event is extremely low.

19.1.5 Air (Noise & Vibration) (Chapter 9)

Construction Phase

The use of best practice noise control measures, hours of operation, scheduling of works within appropriate time periods, and noise monitoring during this phase will be implemented. With the inclusion of the various noise and vibration control measures on site discussed in Section 9.6.1, it is expected that calculated noise levels in Table 9.21 can be reduced by 5 dB.

After the implementation of mitigation measures, there is likely to be residual construction noise levels slightly above the CNT of 65 dB LAeq,T ¬during the site clearance phase at NSLs adjacent to site 3. Referring to Table 12, there is therefore potential for a residual short term, negative and moderate to significant impact at these NSLs during the site clearance and ground preparation phase of the works.

The majority of residual construction noise impacts at NSLs during the remaining work phases at all sites are expected to be controlled to within the CNT, thus resulting in a temporary to short-term, negative and not significant effect.

The residual effect of construction vibration is short term, negative, and not significant.

Operational Phase

Noise levels from any building services plant within the development site will be controlled to not exceed the internal noise levels within Section 9.2.2.1 for residential dwellings within the proposed development.

Once operational noise emissions are controlled within the development site, noise emissions outside the site will be imperceptible. The residual noise effect is neutral, imperceptible and long-term.

Traffic along the surrounding road network will not lead to a change in noise level that would pose any significant effect. The resultant impact is long-term, negative and not significant.

Inward Impact

Noise levels inwards on the proposed development have been measured, calculated and assessed. Mitigation measures in the way of higher enhanced glazing have been specified to ensure that good or reasonable internal noise levels are achieved across the proposed development. The resultant residual noise impact at residents within the development will be negative, not significant and long term.

Cumulative Impact

A full list of developments that are currently permitted or under construction within the surrounding area is contained in the project description chapter. The largest infrastructure project within the vicinity of the proposed development is the Dart+ Southwest project. This has been taken into account within the assessment when considering future rail noise and vibration impacts upon the proposed development.

In the event that construction activities at nearby sites are taking place concurrently with the construction of the proposed development, there is potential for cumulative noise impacts to occur. Due to the nature of construction works associated with each site of the proposed development, noise levels from this site will dominate the noise environment when occurring in proximity to the closest noise sensitive locations along its immediate boundary. The noise contribution from other construction sites would need be equal to those associated with the closest site in order to result in any cumulative effect.

The operational noise limits set for on-site buildings are designed to avoid any significant increase in the prevailing background noise environment external to the site. Operational noise limits included in this report refer to cumulative noise from all fixed installations on site. The design of plant and other fixed installations will be progressed during the design stage to ensure the noise limits at off-site noise sensitive locations are not exceeded.

Traffic volumes assessed take account of the additional traffic from other permitted developments and therefore the traffic noise assessment presented is already assessing the cumulative impact. This assessment has concluded there will be no significant noise impact due to operational traffic.

In conclusion, there is potential for a temporary increase in cumulative construction noise if construction works on the three sites within the development take place concurrently, or other developments occur at the same time. Residual cumulative effects related to the construction phase, post-mitigation, are likely to be not significant. This is also true for the operational phase, provided that the operational noise levels outlined in Section 9.2.2.1 are adhered to during the detailed design, and the mitigation measures specified in Section 9.6 are followed.

19.1.6 Climate (Air Quality) (Chapter 10)

Construction Stage

In order to minimise dust emissions during construction, a series of mitigation measures have been prepared as outlined in Section 10.6.1.1. Provided the dust minimisation measures are adhered to, the predicted residual air quality impacts during the construction phase are ***short-term, direct, negative, localised*** and ***not significant.***

Best practice mitigation measures are proposed for the construction phase of the proposed development, which will focus on the proactive control of dust and other air pollutants, to minimise generation of emissions at source. The mitigation measures that will be put in place during construction will ensure that the impact complies with all EU ambient air quality legislative limit values (set out in Directive 2008/50/EC), which are based on the protection of human health (see Table 10.1). Therefore, the predicted residual, dust-related, human health impact of the construction phase of the proposed development is ***short-term, direct, negative, localised*** and ***not significant.***

Operational Stage

Dispersion modelling of traffic emissions at sensitive receptors in proximity to impacted road links during the operational phase indicate pollutant emissions will be in compliance with the TII assessment criteria which is based on the impacts in the opening year. Section 10.5.1.3.1 determined that the impact to air quality as a result of increased traffic volumes during the operational phase of the proposed development will be ***localised, direct, long-term, negative*** and ***imperceptible*** for the opening year, which is overall ***not significant*** in EIA terms. However, Ireland will need to develop measures to ensure continuing improvements in air quality in future years in order to meet the objectives of the Clean Air Strategy for Ireland (Government of Ireland, 2023) and to ensure the ambient air quality limit values set out in Directive (EU) 2024/2881 are achieved.

With respect to ecological impacts due to operational phase traffic, there is an overall negative, slight and long-term effect which is not significant in EIA terms.

Worst Case Impact

In terms of construction phase impacts, worst-case assumptions regarding volumes of excavation materials and number of vehicle movements have been used in order to determine the highest level of mitigation required in relation to potential dust impacts (see Section 10.6.1.1).

Worst-case traffic data was used in the assessment of construction and operational phase impacts. In addition, conservative background concentrations were used in order to ensure a robust assessment. Thus, the predicted results of the construction and operational stage assessment are worst-case, and the significance of effects is most likely overestimated.

Cumulative

Construction Phase

According to the IAQM guidance (2024), if the construction phase of the proposed development coincides with the construction phase of any other permitted projects within 500 m of the site, there is a possibility of cumulative dust impacts occurring at any nearby sensitive receptors. Should simultaneous construction phases occur, it would lead to cumulative dust soiling and dust-related impacts on human health, specifically localised to the works area associated with the proposed works.

As discussed in Section 10.5.2 a review of the planned and permitted projects within the vicinity of the site was undertaken in order to identify developments with the potential for cumulative construction phase impacts. The assessment has concluded that as the proposed development has a high risk of dust impacts. However, provided the dust mitigation measures outlined in Section 10.6.1.1 are applied during the construction phase this 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 and the cumulative developments are deemed ***short-term, direct, negative*** and ***slight*** which is overall **not significant**

Operational Phase

There is the potential for cumulative impacts to air quality during the operational phase as a result of traffic associated with other existing and permitted developments within the area. The traffic data provided for the operational stage air quality assessment included cumulative traffic associated with existing and permitted developments in the wider area as required (see Traffic Impact Assessment and Chapter 13 for further details on specific developments). The cumulative operational phase impact is assessed within Section 10.5.1.3.1 and was found to have at most neutral increases in pollutant concentrations as per the TII criteria (Table 10.3). The cumulative operational stage impact is ***long-term, localised, direct, negative, imperceptible*** and ***not significant***.

Worst Case Impact

The worst-case impact for the proposed development discussed in Section 10.7.1.3 is also applicable to the cumulative scenario.

19.1.7 Climate (Climate Change) (Chapter 11)

Proposed Development

The impact to climate as a result of a proposed development must be assessed as a whole for all phases. The proposed development will result in some impacts to climate through the release of GHGs. TII reference the IEMA guidance which states that the crux of assessing significance is “not whether a project emits GHG emissions, nor even the magnitude of GHG emissions alone, but whether it contributes to reducing GHG emissions relative to a comparable baseline consistent with a trajectory towards net zero by 2050”. The proposed development has proposed some best practice mitigation measures and is committing to reducing climate impacts where feasible and will continue to investigate further measures during detailed design. As per the assessment criteria in Table 11.4,

the residual impact of the proposed development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight***, which is overall ***not significant*** in EIA terms.

In relation to climate change vulnerability, it has been assessed that there are no significant risks to the proposed development as a result of climate change. The residual effect of climate change on the proposed development is considered ***direct, long-term, negative*** and ***imperceptible***, which is overall ***not significant*** in EIA terms.

Cumulative

With respect to the requirement for a cumulative assessment the IEMA (IEMA, 2022) and TII (TII, 2022a) 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*".

The traffic data used for the operational phase assessment included cumulative traffic from existing and permitted developments in the surrounding area. Therefore, this impact assessment is cumulative.

As per the above, the cumulative impact of the proposed development in relation to GHG emissions is considered ***direct, long-term, negative*** and ***slight***, which is overall ***not significant*** in EIA terms.

Worst Case Impact

Conservative assumptions have been made throughout the assessment. Specifically, as part of the GHG assessment, where specific materials were not available conservative equivalent material types were used instead. Additionally, in places, where exact material types were not known for the GHG assessment, the standard average material was assumed which can have a higher embodied carbon associated with it. Therefore, the assessment has been conservative in nature and is likely worst-case.

19.1.8 Landscape and Visual Impact (Chapter 12)

Proposed Development

There are a number of mitigation measures which will be implemented by the Developer to prevent and reduce significant impacts during the construction and operational phases.

Construction Phase

Appropriate measures will be taken to mitigate' any potentially adverse construction-related effects on immediately adjoining neighbors, particularly on the residents of the existing residential developments to the south and under construction development to the west.

Operation of a well-managed organised and planned construction site, with adequate control of construction traffic and working activity, is key to avoiding or minimising impact.

Construction Phase Mitigation Measures

Character of potential impact	Mitigation Measure
Construction Phase	
Protecting of existing trees	Provision of secure hoarding / tree protection measures for existing retained trees to the west and north of the site lands.
Materials falling from a height	Use of screening and webbing to prevent materials falling from a height endangering local residents and members of the public.

Site lighting	Directing site lighting away from existing residents.
Building phasing	Phasing of development in order that the buildings and surrounding landscape works are completed as soon as possible.
Landscape Contractor selection	Landscape Architect to ensure a competent experienced landscape contractor is appointed to undertake the work
Landscape tender implementation	Landscape Architect to oversee soil preparation, planting and hard works commissioning to be as specified in the in the Landscape Drawings and Landscape Hard works and Soft woks specifications.

The residual neutral, slight short term visual impacts arising during the construction phase will relate primarily to the rising buildings and associated hoarding, scaffolding and cranes when viewed from the surrounding area. As these are short term the completed buildings and associated hard and soft landscape elements will tie the development into its surrounds. It is not envisaged that there would be any residual impacts from the construction phase other than the usual developing and establishing planting and other normal minor landscape maintenance and replacement issues.

Operational Stage

Consistent and effective maintenance of hard and soft landscape areas, (in particular entrance areas, open space area and pathways) together with quality site and building management are key to avoiding or minimising residual negative landscape and visual impacts arising from the operation of the proposed developments.

The design and layout of the proposed open spaces is considered appropriate in terms of its character, zoning and context. The proposed scheme (Refer to the Landscape Architects drawings) includes for a series of measures that will be positive, moderate in the long-term.

Worst Case Impact

The commencement but non-completion of the site works, leaving a series of unfinished buildings on site would be the worst-case scenario, however given the location and zoning on the land it is unlikely that if this did happen it would be a permanent scenario.

19.1.9 Material Assets (Transportation) (Chapter 13)

Construction Phase

Provided the above remedial or reductive measures and management procedures are incorporated during the construction phase, the residual impact on the local receiving environment will be temporary in nature and neutral in terms of quality and effect.

The significance of each of the projected impacts during the construction phase is detailed in ***Table*** (Table 18.6 below) for the following key junctions:

- Junction 1 – Adamstown Avenue / Station Road;
- Junction 2 – Adamstown Avenue / CNLS;
- Junction 3 – Thomas Omer Way / Adamstown Avenue / R136 Grange Castle Road;
- Junction 4 – R136 Grange Castle Road / CNLS;
- Junction 5 – R136 Grange Castle Road / CSLS; and
- Junction 6 – Thomas Omer Way / R113 Fonthill Road.

The significance of the impacts has been determined in accordance with the classifications stipulated within the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, May 2022).

Junction ID	Location	Environment Character	Quality / Scale of Impact	Impact Significance	Duration
1	Adamstown Avenue / Station Road	Low Sensitivity	Negative - Low	Not Significant	Temporary
2	Adamstown Avenue / CNLS	Low Sensitivity	Negative - Low	Not Significant	Temporary
3	Thomas Omer Way / Adamstown Avenue / R136 Grange Castle Road	Low Sensitivity	Negative - Medium	Not Significant	Temporary
4	R136 Grange Castle Road / CNLS	Low Sensitivity	Negative - Medium	Not Significant	Temporary
5	R136 Grange Castle Road / CSLS	Low Sensitivity	Negative - Medium	Not Significant	Temporary
6	Thomas Omer Way / R113 Fonthill Road	Low Sensitivity	Negative - Low	Not Significant	Temporary

Table 18.6 Impact Assessment – Construction Phase

Operational Stage

The significance of each of the projected impacts during the operational phase are detailed in ***Table*** (Table 18.7 below) for the following key junctions:

- Junction 1 – Adamstown Avenue / Station Road;
- Junction 2 – Adamstown Avenue / CNLS;
- Junction 3 – Thomas Omer Way / Adamstown Avenue / R136 Grange Castle Road;
- Junction 4 – R136 Grange Castle Road / CNLS;
- Junction 5 – R136 Grange Castle Road / CSLS; and
- Junction 6 – Thomas Omer Way / R113 Fonthill Road.

The significance of the impacts has been determined in accordance with the classifications stipulated within the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports (EPA, May 2022).

Junction ID	Location	Environment Character	Quality / Scale of Impact	Impact Significance	Duration
1	Adamstown Avenue / Station Road	Low Sensitivity	Negative - Low	Not Significant	Short/Medium-term
2	Adamstown Avenue / CNLS	Low Sensitivity	Negative - Low	Not Significant	Short/Medium-term
3	Thomas Omer Way / Adamstown Avenue / R136 Grange Castle Road	Low Sensitivity	Negative - Medium	Not Significant	Short/Medium-term
4	R136 Grange Castle Road / CNLS	Low Sensitivity	Negative - Medium	Not Significant	Short/Medium-term
5	R136 Grange Castle Road / CSLS	Low Sensitivity	Negative - Medium	Not Significant	Short/Medium-term
6	Thomas Omer Way / R113 Fonthill Road	Low Sensitivity	Negative - Low	Not Significant	Short/Medium-term

Table 18.7 Impact Assessment – Operational Phase

The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer package TRANSYT for one signal-controlled junction.

When considering signalised junctions, a Degree of Saturation (DoS) of greater than 90% (0.90) would indicate a junction to be approaching capacity, as operation above this DoS value is poor and deteriorates quickly.

For the TRANSYT analysis a one-hour AM and PM period has been simulated, from 08:00 to 09:00 and 17:00 to 18:00 respectively. For the TRANSYT analyses traffic flows were entered using an Origin-Destination table for the peak hours.

In order to analyse and assess the impact of the proposed development on the surrounding road network, a traffic model of the junctions was analysed for the schemes following opening and design years:

- 2028 – Opening Year;
- 2043 – Future Design Year (Opening Year + 15 years)

The following key junctions, illustrated in **Figure** (Figure 18.1 below), have been analysed:

- Junction 3 – Thomas Omer Way / Adamstown Avenue / R136 Grange Castle Road;
- Junction 4 – R136 Grange Castle Road / CNLS;
- Junction 5 – R136 Grange Castle Road / CSLS;

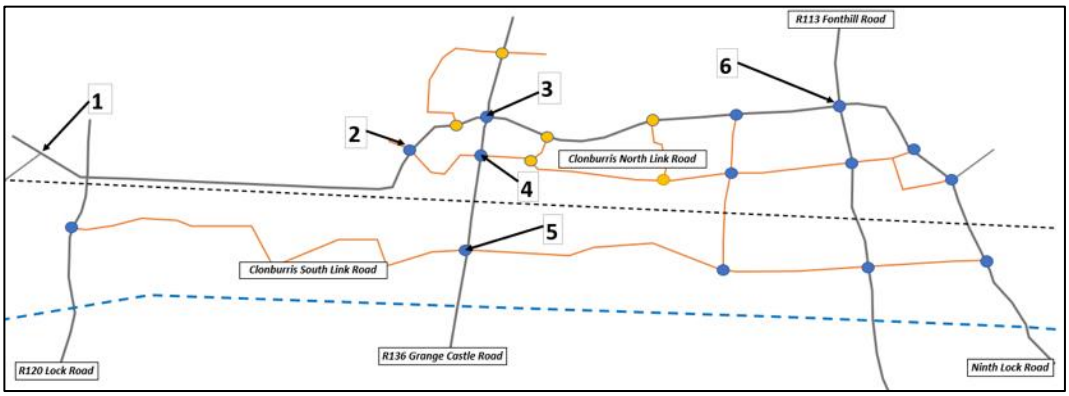

Figure 18.1: Junctions Included Within the Network Analysis

The evaluation of the operational performance of the key off-site junctions following the implementation of the proposed mixed-use scheme is summarised below for the "Do Nothing" (DN) and "Do Something" (DS) scenarios.

The revised network analysis of Junctions 3, 4 and 5 has been updated to investigate the following two scenarios thereby enabling a comparison and evaluation of the results for all scenarios:

The "Do-Nothing" (DN) traffic scenario takes into account the potential level of traffic that could be generated by other "committed development", in addition to the existing flows travelling across the network subjected to growth rates.

The proposed development traffic flows are then added to the network's "Do-Nothing" (Base with growth rates applied + Committed Development) traffic flows to establish the new post development "Do-Something" (DS) traffic flows.

In addition, ***Table*** , ***Table*** and ***Table*** (Tables 18.8, 18.9 and 18.10 below) provide a summary of the operational performance of Junctions 3, 4 and 5 based upon the findings of the TRANSYT-based junction assessments.

Year	Scenario	Junction 3
		R113 Fonthill Road / CSLS

2028	DN	AM	91%
		PM	186%
	DS	AM	101%
		PM	192%
	DN v. DS	AM	+10%
		PM	+6%
2043	DN	AM	178%
		PM	180%
	DS	AM	187%
		PM	190%
	DN v. DS	AM	+9%
		PM	+10%

Table 18.8 Impact Significance – Operational Phase – Junction 3

Year	Scenario		Junction 4
			R136 Grange Castle Road / CNLS
2028	DN	AM	106%
		PM	89%
	DS	AM	117%
		PM	89%
	DN v. DS	AM	+11%
		PM	+0%
2043	DN	AM	186%
		PM	161%
	DS	AM	197%
		PM	167%
	DN v. DS	AM	+11%
		PM	+6%

Table 18.9 Impact Significance – Operational Phase – Junction 4

Year	Scenario		Junction 5
			R136 Grange Castle Road / CSLS
2028	DN	AM	165%
		PM	123%
	DS	AM	176%
		PM	138%
	DN v. DS	AM	+11%
		PM	+15%
2043	DN	AM	252%
		PM	246%
	DS	AM	273%
		PM	261%
	DN v. DS	AM	+21%
		PM	+15%

Table 18.10 Impact Significance – Operational Phase – Junction 5

TRANSYT assessment for Junction 3 shows an oversaturated performance during the morning and evening peak hours in the DN and DS scenarios. However, the impact of the development is an increase of 10% in capacity in the evening, and 9% in capacity in the morning. This means that the network is over capacity regardless of the Proposed Development.

TRANSYT assessment for Junction 4 shows an oversaturated performance during the morning and evening peak hours in the DN and DS scenarios. However, the impact of the development is an increase of 6% in capacity in the evening, and 11% in capacity in the morning. This means that the network is over capacity regardless of the Proposed Development.

TRANSYT assessment for Junction 5 shows an oversaturated performance during the morning and evening peak hours in the DN and DS scenarios. However, the impact of the development is an increase of 15% in capacity in the evening, and 21% in capacity in the morning. This means that the network is over capacity regardless of the Proposed Development.

This result is expected and consistent with the Traffic and Transport Assessments of the Southern Link Street – Clonburris SDZ and Clonburris Stage 2 Infrastructure, prepared by DBFL Consulting Engineers. These documents showed an oversaturated network for Opening Year and Future Horizon Year, similar to results obtained above. It is important to note that the analysis has assumed the pedestrian stage will be called during every cycle. As such the TRANSYT analysis represents a worst-case scenario, with the junctions likely performing better than the TRANSYT results indicate. Additionally, the area will be served with high frequency bus and rail services, high quality cycle infrastructure and new road developments.

The Traffic Flow Diagrams are included in Appendix 13.1 and the TRANSYT Output Files are included in Appendix 13.3.

19.1.10 Material Assets (Waste) (Chapter 14)

The implementation of the mitigation measures outlined in Section 14.6 will ensure that targeted rates of reuse, recovery and recycling are achieved at the site of the proposed development during the construction and operational stages. It will also ensure that European, National and Regional legislative waste requirements with regard to waste are met and that associated targets for the management of waste are achieved.

Construction Stage

A carefully planned approach to waste management as set out in Section 14.6.1 and adherence to the RWMP (which includes mitigation) (Appendix 14.1) during the construction stage will promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of prevention reuse, recycling and recovery is achieved, the predicted impact of the construction stage on the environment will be **short-term, imperceptible** and **neutral.**

Operational Stage

During the operational stage, a structured approach to waste management as set out in Section 14.6.2 and adherence to the OWMP (which includes mitigation) (Appendix 14.2) will promote resource efficiency and waste minimisation. When the mitigation measures are implemented and a high rate of reuse, recycling and recovery is achieved, the predicted impact of the operational stage on the environment will be **long-term, imperceptible** and **neutral.**

Worst Case Impact

In a worst-case scenario, if no mitigation measures found in Section 14.6 or in Appendices 14.1 and 14.2 are followed, lack of waste prevention, poor onsite waste management, non-permitted waste contractors or unauthorised waste facilities could give rise to inappropriate management of waste offsite and result in negative environmental impacts or pollution as shown in Section 14.5.

19.1.11 Material Assets (Utilites) (Chapter 15)

Construction Stage

Implementation of measures outlined in Section 15.6.1 will ensure that the potential impacts of the proposed development on site services do not occur during the construction phase and that any residual impacts will be short term.

Operational Stage

Demand from the proposed development during the operational phase is not predicted to impact on the existing power, gas and telecoms network.

Worst Case Impact

There are no predicted impacts should the proposed development not proceed.

19.1.12 Cultural Heritage (Archeological & Architectural) (Chapter 16)

Construction Stage

Following the completion of mitigation measures, there will be no significant residual impacts upon the archaeological and cultural heritage resource.

Operational Stage

Not applicable.

Worst Case Impact

Not applicable.

19.1.13 Risk Management (Major Accidents & Disasters) (Chapter 17)

The risk of a major accident and / or disaster during the Construction Phase of the Proposed Development is considered low.

The risk of a major accident and / or disaster during the Operational Phase of the Proposed Development is considered low.