

15 INTERACTIONS

15.1 Introduction

As a requirement of Planning Regulations and the Environmental Protection Agency's '*Guidelines on information to be contained in Environmental Impact Assessment Reports*' (2017), interrelationships between various environmental aspects must be considered when assessing the impact of the Proposed Development, as well as individual significant impacts. The significant impacts of the Proposed Development and the proposed mitigation measures have been detailed in the relevant chapters of this report. However, as with all developments that pose potential environmental impacts, there also exists potential for interactions/interrelationships between the impacts of different environmental aspects. The results may exacerbate or ameliorate the magnitude of impacts. This chapter of the EIAR addresses the interactions between the various environmental factors of the Proposed Development.

The following Section is directed by Article 3 section 1(e) of the EIA Directive. The EPA Guidelines on the information to be contained in Environmental Impact Assessment Reports (EPA, 2022), Advice Notes for Preparing Environmental Impact Statements (Draft, September 2015) and OPR Practice Note PN02 Environmental Impact Assessment Screening (June 2021) were also considered.

Article 3 of the Directive states:

1. The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case, the direct and indirect significant effects of a project on the following factors:
 - a) population and human health;
 - b) biodiversity, with particular attention to species and habitats protected under Directive 92/43/EEC and Directive 2009/147/EC;
 - c) land, soil, water, air and climate;
 - d) material assets, cultural heritage and the landscape;
 - e) the interaction between the factors referred to in points (a) to (d)

15.1.1 Quality Assurance and Competency of Experts

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Lakshmi has a Master of Science degree in Environmental Science from University College Dublin, Master of Science degree in Zoology from Ethiraj College for Women, India, and Bachelor of Science in Zoology from Madras Christian College India. Lakshmi has worked as a Graduate Environmental Consultant with Enviroguide since 2023 and has experience preparing Environmental Impact Assessment (EIA) Screening Reports, Effects Interactions and Mitigation and Monitoring chapters of the EIARs.

This chapter was reviewed by Harry Parker, Technical Director and EIA Lead at Enviroguide. Harry is an environmental consultant with 17 years' experience in consultancy, specialising in

EIAs for large-scale residential and commercial developments, working closely with a range of developers, planning consultants and architects within the public and private sector. Harry has a MA in Environmental Impact Assessment and Management from the University of Manchester, UK.

15.2 Study Methodology

The interactions between impacts on different environmental factors have been addressed throughout this EIAR. Close co-ordination and management with the EIAR team was carried out to ensure that all likely relevant interactions were addressed at the scoping stage of the EIAR, and interactions have been adequately assessed.

Following an assessment of the EIAR, a matrix was produced to display where interactions between impacts on different factors have been addressed. This has been carried out by use of chapter headings included in the EIAR and details of any interaction during all phases of the Proposed Development.

15.3 Interactions

The following matrix has been produced to show where potential significant interactions between effects on different factors have been addressed, see Table 15-1.

As this EIAR has been prepared by a number of specialist consultants, an important aspect of the EIA process was to ensure that interactions between the various disciplines have been taken into consideration. The principal interactions requiring information exchange between the environmental specialists and the design team are summarised in Table 15-2 to Table 15-11.

Table 15-1: Interactions between Factors

Interaction	4. Population and Human Health	5. Biodiversity	6. Land and Soils	7. Hydrology and Hydrogeology	8. Air Quality and Climate	9. Noise and Vibration	10. Landscape and Visual	11. Archaeology and Cultural Heritage	12. Material Assets Waste and Utilities	12. Material Assets - Traffic
Population and Human Health		x	✓	✓	✓	✓	✓	x	✓	✓
Biodiversity	x		✓	✓	✓	✓	✓	x	✓	x
Land and Soils	x	✓		✓	x	x	x	x	✓	x
Hydrology and Hydrogeology	✓	✓	✓		x	x	x	x	✓	x
Air Quality and Climate	✓	✓	✓	x		x	x	x	x	✓
Noise and Vibration	✓	✓	x	x	x		x	x	x	✓
Landscape and Visual Amenity	✓	x	✓	x	x	x		✓	x	x
Archaeology, Architectural and Cultural Heritage	x	x	x	x	x	x	x		x	x
Material Assets – Waste and Utilities	x	x	x	✓	x	x	x	x		x
Material Assets - Traffic	✓	x	✓	x	✓	✓	x	x	✓	

	No Interaction
	Potential Interaction
	N/A

Table 15-2 Population and Human Health

Population and Human Health	
Summary	
Chapter 4 of this EIAR, <i>Population and Human Health</i> , details the direct and indirect effects of the Proposed Development on Population and Human Health; and sets out any required mitigation measures where appropriate.	
Interactions	
Hydrology	Contamination events can impact the water quality and thus impact the human health of the surrounding population. Appropriate surface water control measures will be implemented as part of the Proposed Development. No public health issues associated with the water conditions at the site have been identified for the Construction Phase or Operational Phase of the Proposed Development.
Air Quality and Climate	Interactions with air quality during the construction and operational phase has the potential to cause issues relating to dust and traffic emissions impacting human health. However, Chapter 8 has concluded that there will be no significant air quality impacts. All ambient air quality legislative limits will be complied with and therefore the predicted impact is not significant with a neutral effect on human health.
Noise and Vibration	Construction activities such as site clearance, building construction works, and trucks and vehicles entering and exiting the site have the potential to interact with the surrounding population and human health and cause noise disturbance. The impact assessment of noise and vibration has concluded that additional noise associated with the construction and Operational Phase will not cause a significant adverse effect. Operational Phase noise impacts have also been assessed in relation to traffic and plant equipment and no significant adverse effects will be experienced. As such, there will be no significant impact on population and human health.
Landscape and Visual	The Proposed Development will alter the visual appearance of the site which is predominantly a greenfield site excluding the existing buildings to be demolished. It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the site of the Proposed Development and the suburban nature of the surrounding landscape, will cause any

	significant impacts and as such there will be no significant impact on population and human health.
Traffic and Transport	Construction and operational activities will result in an increased number of HGV and car movements. There is a potential impact on population and human health in relation to the capacity and operation of the surrounding road network. The overall impact of the Proposed Development on the transportation infrastructure in the local area will not be significant and subsequently there will be no significant impact on population and human health.
Conclusions	
Potential impacts have been outlined in the respective Chapters specified above. Mitigation measures employed at the Proposed Development will ensure that no significant impacts occur.	

Table 15-3: Biodiversity

Biodiversity	
Summary	
Chapter 5 of this EIAR, Biodiversity, details the direct and indirect effects of the Proposed Development on the local flora and fauna; and sets out any required mitigation measures where appropriate.	
Interactions	
Land and Soil	Interactions between land and soils and biodiversity can occur through the spread of any hazardous material/contaminated land which may occur during the construction stage. The spread of land contaminated with potentially hazardous material could result in habitat degradation of habitats within the Proposed Development site and adjacent/downstream designated sites and their associated QIs. Following the implementation measures outlined within the CEMP, impacts to habitats, flora and fauna from soils and land interactions are not predicted to be significant.
Hydrology	Interactions between hydrology and biodiversity including habitats, flora and fauna can occur through impacts to water quality either arising from an accidental pollution event or increased sedimentation during the construction stage, or an accidental pollution event during

	the operational stage. This interaction has the potential to result in significant impacts on hydrologically connected habitats and sensitive fauna that rely on these habitats. However, for reasons outlined in the relevant sections impacts to downstream sensitive habitats and fauna are not predicted to be significant.
Air Quality and Climate	Interactions between air quality and flora and fauna in adjacent habitats and designated sites can occur during the construction stage due to dust emissions arising from construction works. This interaction has the potential to result in significant impacts on biodiversity. However, once the dust minimisation measures prescribed in the CEMP are implemented, impacts to flora and fauna are not predicted to be significant.
Noise and Vibrations	Interactions between noise and sensitive fauna, namely birds, bats and badgers can arise from increased noise levels during the construction stage. This interaction has the potential to result in significant impacts and has been assessed when considering disturbance impacts during construction. However, for reasons outlined in the relevant sections impacts to fauna from noise interactions are not predicted to be significant.
Conclusions	
Potential significant impacts have been identified for Land and Soils, Hydrology, Air Quality and Climate and Noise and Vibration. Mitigation measures have been outlined in Chapter 6, 7, 8 and 9 respectively.	

Table 15-4: Land and Soils

Land and Soil	
Summary	
Chapter 6 of this EIAR, <i>Land and Soil</i> , details the direct and indirect effects of the Proposed Development on the local land, soils, and geology; and sets out any required mitigation measures where appropriate. There are a number of potential pollutants associated with the construction and operational phases which have the potential to impact on the environment.	
Interactions	
Population and Human Health	There is a potential risk of dust generated from excavation and stockpiling of soil during the construction phase of the Proposed Development posing a human health risk in the absence of standard

	<p>avoidance and mitigation measures which will be implemented to be protective of human health.</p> <p>Appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase of the Proposed Development that will be protective of site workers.</p>
Biodiversity	<p>An assessment of the potential impacts of the Proposed Development on the Biodiversity of the site, with emphasis on habitats, flora and fauna which may be impacted a result of the excavation and importation of materials to the site are included in Chapter 5 of this EIAR. It also provides an assessment of the impacts of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.</p>
Hydrology and Hydrogeology	<p>An assessment of the potential impact of the Proposed Development on the hydrological and hydrogeological environment is included in Chapter 7 of this EIAR. In the absence of avoidance, remedial and mitigation measures, there is a potential for sediment from excavated soils entering runoff and discharging into receiving local drainage during the construction phase of the Proposed Development. Procedures for the protection of receiving water environment are set out in Chapter 7 of this EIAR.</p>
Air Quality and Climate	<p>The excavation of soils across the site and the temporary stockpiling of soils pending reuse or removal offsite has the potential to generate nuisance impacts (i.e., dust) during the construction phase of the Proposed Development. An assessment of the potential impact of the Proposed Development on air quality is included in Chapter 8 of this EIAR.</p>
Landscape and Visual	<p>During the construction phase and into the operational phase of the Proposed Development, the site landscape will undergo a change from undeveloped lands to residential and commercial / retail with associated landscaping. An assessment of the potential impact of the Proposed Development on the receiving landscape is included in in Chapter 10 of this EIAR.</p>
Material Assets: Traffic and Transport	<p>Where possible, it is intended to retain and re-use the excavated soil and subsoil on the site for engineering fill and landscaping. However, it is anticipated that approximately 66,400m³ of excavated soil will require removal offsite. There is also a requirement to import aggregates during the construction phase of the Proposed Development. The assessment of the potential impact of the Proposed Development is included in Chapter 13 of this EIAR.</p>

Conclusions

Potential impacts have been outlined in the respective Chapters specified above. The mitigation measures outlined in the CEMP and the respective Chapters outlined above, will ensure that there will be no significant adverse impacts on the receiving land, soil and geology associated with the Construction Phase and the Operational Phase of the Proposed Development.

Table 15-5: Hydrology and Hydrogeology

Hydrology and Hydrogeology	
Summary	
Chapter 7 of this EIAR, <i>Hydrology and Hydrogeology</i> , provides an assessment of the potential impacts of the Proposed Development on hydrology, water and hydrogeology and sets out any required mitigation measures where appropriate. Consideration is given to habitats and species protected by national and international legislation or considered to be of particular conservation importance.	
Interactions	
Population and Human Health	<p>No public health issues associated with the water (hydrology and hydrogeology) conditions at the site have been identified for the construction phase or operational phase of the Proposed Development.</p> <p>Appropriate industry standard and health and safety legislative requirements will be implemented during the construction phase that will be protective of site workers.</p>
Biodiversity	<p>An assessment of the potential impacts of the Proposed Development on the biodiversity of the Site, with emphasis on habitats, flora and fauna which may be impacted as is included in Chapter 5 of this EIAR such as potential pollution of waterbodies impacting on flora and fauna in the absence of mitigation measures.</p> <p>Chapter 5 addresses the impact of the Proposed Development on habitats and species, particularly those protected by national and international legislation or considered to be of particular conservation importance and proposes measures for the mitigation of these impacts.</p>
Lands, Soil and Geology	<p>In the absence of avoidance and mitigation measures, there is a potential for sediments from excavated soils entering the drainage network and tracking downstream during the construction phase.</p>

Material Assets: Waste and Utilities	<p>During the construction phase of the Proposed Development discharge of water will be accordance with the necessary discharge licences issued by UE under Section 16 of the Local Government (Water Pollution) Acts and Regulations for any water discharges to sewer or from Kildare County Council under Section 4 of the Local Government (Water Pollution) Act 1977, as amended in 1990 for discharges to surface water.</p> <p>During the construction phase of the Proposed Development, any connection of welfare facilities to the public foul drainage network will be undertaken in accordance with the necessary temporary discharge licences issued by UE.</p> <p>During the operational phase of the Proposed Development, any discharge to the public foul sewer and water supply will be under consent from UE.</p>
Conclusions	
<p>The protective/avoidance/mitigation measurements that will be applied as set out in the CEMP, will ensure that the Proposed Development will not give rise to any likely significant impacts.</p>	

Table 15-6: Air Quality and Climate

Air Quality and Climate	
Summary	
<p>Chapter 8 of this EIAR, <i>Air Quality and Climate</i>, provides an assessment of the potential impacts of the Proposed Development on ambient air quality and climate, and sets out appropriate mitigation measures where necessary.</p>	
Interactions	
Population and Human Health	<p>Interactions between Air Quality and Population and Human Health have been considered as the Proposed Development has the potential to cause health issues as a result of impacts on air quality from dust nuisances and potential traffic derived pollutants. However, the mitigation measures employed at the Proposed Development will ensure that all impacts are compliant with ambient air quality standards and human health will not be affected. Furthermore, traffic-related pollutants have been assessed and determined as having an overall insignificant impact, therefore air</p>

	quality impacts from the Proposed Development are not expected to have a significant impact on population and human health.
Biodiversity	Interactions between Air Quality and Biodiversity have been considered as the construction phase has the potential to interact with flora and fauna in adjacent habitats and designated sites due to dust emissions arising from the construction works. However, the mitigation measures employed at the Proposed Development will ensure that the impacts to flora and fauna are not significant.
Material Assets: Traffic and Transport	There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed not significant. Therefore, the impact of the interaction between air quality and climate is not significant.
Conclusions	
Mitigation measures employed at the Proposed Development will ensure that no significant impacts occur.	

Table 15-7: Noise and Vibration

Noise and Vibration
Summary
Chapter 9 of this EIAR, <i>Noise and Vibration</i> , provides a description and assessment of the likely impact of the proposed activities from noise, and sets out appropriate mitigation measures where necessary. Noise-generating activities during the Construction Phase are expected not to have adverse implications for biodiversity. Noise associated with the operation of on-site machinery will not create any major negative impacts beyond the site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development.
Interactions

Population and Human Health	<p>The impact assessment of noise and vibration has concluded that additional noise associated with the Proposed Development will not have any significant negative impacts. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development. No likely significant human health impacts are anticipated as a result of noise from the Proposed Development.</p>
Biodiversity	<p>The noise and vibration effects of the Proposed Development will cause disturbance to the local fauna including birds during the construction phase of the Proposed Development; however, the proposed mitigation measures will reduce this disturbance. No likely significant biodiversity impacts are anticipated as a result of noise from the Proposed Development.</p>
Material Assets: Traffic and Transport	<p>The Proposed Development will have no significant impact on overall traffic volumes and therefore traffic will not result in any significant increase in noise at sensitive receptors. There is the potential for traffic related noise to impact residents during the operational phase of the Proposed Development; however, there will be no significant impact, due to the implementation of the following proposed mitigation measures, as specified in the “Stage 2” Acoustic Design Statement:</p> <ul style="list-style-type: none"> • Provision of glazing with minimum sound insulation properties as outlined in the ProPG: Acoustic Design Statement (RSK Ireland Limited, 2024); and • Provision of acoustic attenuation to ventilation systems for dwellings as outlined in the ProPG: Acoustic Design Statement (RSK Ireland Limited, 2024).
Conclusions	
<p>Noise associated with the operational plant or machinery will not create any significant adverse impacts beyond the site boundary. Mitigation and monitoring measures will be incorporated to further reduce the potential for noise generation from the Proposed Development.</p>	

Table 15-8: Landscape and Visual

Landscape and Visual	
Summary	
Chapter 10 of the EIAR, <i>Landscape and Visual Assessment</i> , provides a description and assessment of the likely impact of the Proposed Development on the landscape and visual amenities of the area.	
Interactions	
Population and Human Health	It is not considered that the Proposed Development by virtue of its visual appearance and in the context of the proposed zoning of the site of the Proposed Development and the suburban village and residential nature of the surrounding landscape, will cause any issues for the residential local population.
Biodiversity	<p>The proposed landscaping of the site interacts with its biodiversity and ecology through the changes that will occur to the existing habitats and flora at the site. The landscaping proposals will entail losses and contributions in terms of vegetation at the site, which in turn will affect the ecology of the site. The site in its current condition is not of high ecological value, and the proposed landscaping will not result in significant adverse effects in this regard.</p> <p>It is noted that the Proposed Development further negates any habitat loss through the provision of a number of planted garden areas and green roofing included in the project design. As such, no significant cumulative habitat loss will occur involving the Proposed Development.</p>
Archaeology and Cultural Heritage	As there are no known archaeological or architectural remains found during the desk top survey as well as the walkover survey, it is not predicted that any changes in landscape or visual impact will affect in any way the archaeology of the area.
Conclusions	
No significant effect interactions identified for Landscape and Visual aspects of the surrounding environment are expected from the Proposed Development.	

Table 15-9: Archaeology and Cultural Heritage

Archaeology and Cultural Heritage	
Summary	
Chapter 11 of the EIAR, <i>Archaeology and Cultural Heritage</i> , provides information on the known architectural, archaeological, and cultural heritage sites in the study area.	
Interactions	
N/A	No interactions have been identified.
Conclusions	
No interactions have been identified.	

Table 15-10: Material Assets - Waste and Utilities

Material Assets - Waste and Utilities	
Summary	
Chapter 12 of the EIAR, <i>Material Assets</i> , provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic, built services and infrastructure.	
Interactions	
Population and Human Health	The improper removal, handling and storage of hazardous waste could negatively impact on the health of construction workers. Extended power or telecommunications outages, or disruption to water supply or sewerage systems for existing properties in the area could negatively impact on the surrounding human population and their overall health. Potential impacts on population and human health are addressed in Chapter 4.
Biodiversity	The improper handling and storage of waste during the Construction and Operational Phases could negatively impact on biodiversity. Potential impacts on biodiversity are addressed in Chapter 5.

Land and Soil	Improper handling and segregation of hazardous or contaminated wastes could lead to the contamination of soil and stones excavated from the site. Potential impacts on land and soils are addressed in Chapter 6.
Material Assets: Traffic	Waste collection activities at the Proposed Development have the potential to impact upon traffic movements in the Kiltarnan area. Potential impacts on traffic are addressed in Chapter 13.
Conclusions	
With the implementation of all mitigation measures detailed in the respective Chapters, there will be no negative residual impacts upon the Material Assets: Waste and Utilities.	

Table 15-11: Material Assets: Traffic

Material Assets – Traffic and Transport	
Summary	
Chapter 13 of the EIAR, <i>Material Assets</i> , provides an assessment of the potential impacts of the Proposed Development on Material Assets including traffic, built services and infrastructure.	
Interactions	
Population and Human Health	<p>Construction activities will result in an increased number of HGV movements during the construction phase. The Proposed Development will also result in an increase in the population of the surrounding area and subsequently an increase in the number of vehicles.</p> <p>There is potential for impacts on population and human health in relation to the capacity and operation of the surrounding road network. However, according to Chapter 13 Traffic, the impact of development traffic is of the order of low in the case of the without GDRS to negligible when the GDRS is available.</p>
Air Quality and Climate	There can be a significant interaction between air quality, climate and traffic. This is due to traffic-related pollutants that may arise. In the current assessment, traffic derived pollutants which may affect Air Quality and Climate have been deemed as negligible. Therefore,

	the impact of the interaction between air quality and climate and traffic is insignificant.
Noise and Vibration	Traffic has the potential to increase noise impacts on nearby sensitive receptors. The Proposed Development will have no significant impact on overall traffic volumes and therefore traffic will not result in any significant increases of noise at sensitive receptors
Conclusions	
With the implementation of all mitigation measures detailed in the respective Chapters, there will be no negative residual impacts upon the Material Assets: Traffic and Transport.	