

20 SUMMARY OF RESIDUAL AND CUMULATIVE IMPACTS

20.1 INTRODUCTION

This Chapter of the EIAR collates the predicted residual impacts on the environment as identified in Chapters 5 to 18, 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 19: Summary of Mitigation Measures.

20.1.1 Population & Human Health (Chapter 5)

20.1.1.1 Proposed Development

Construction Stage

Businesses and Residences

The construction stage is considered to have the potential to have a **positive, not significant, short-term** residual impact on the economy and employment of the local and wider area.

Landscape Amenity and Tourism

With reference to Chapter 13 (Landscape and Visual Impact), the predicted impacts from the analyses of photomontages are **short-term** and **negative**, as discussed in section 13.11.1.

Land and Water Emissions

The implementation of the mitigation measures detailed in Section 5.6.1 (and Section 7.6.1 of Chapter 7 Land, Soils, and Geology, and Section 8.6.1 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, slight and short-term**.

Air Emissions

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active 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 of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development will be **direct, short-term, negative, localised and not significant** with respect to human health.

Noise and Vibration Emissions

The application of binding noise limits and hours of operation, along with implementation of appropriate noise and vibration control measures (outlined fully in Section 12.6.1.1 and 12.7.1.1 of Chapter 12 - Noise and Vibration), will ensure that noise and vibration impact is kept to a minimum as far as practicable. During the bulk of the construction the construction works will implement general construction techniques where the residual construction noise impacts relating to general construction are predicted to be controlled to within the CNT, thus resulting in the residual impact being **negative, not significant to moderate and short-term**.

The residual effect of construction vibration is **short-term, negative and moderate - significant**.

Traffic and Transportation

Provided the mitigation measures outlined in Chapter 14 (Material Assets - Transport) are incorporated during the construction phase, the residual impact upon the local population from traffic is predicted to be **neutral** and **temporary**.

Major Accident Hazards and/or Natural Disasters

There are no significant potential impacts on Human Health from Major Accident Hazards and/or Natural Disasters; therefore, there are no residual impacts.

Operational Stage

Businesses and Residences

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

Amenity and Tourism

With reference to Chapter 13 (Landscape and Visual Impact), the residual effects of the Proposed Development on the landscape and visual amenities are **neutral, moderate** and **long-term**.

No mitigation is proposed regarding impacts on local tourism or amenities as impacts will be positive. The operational phase, therefore, is considered to have the potential to have a **positive, not significant, long-term** residual impact on the local population.

Land and Water Emissions

The implementation of the mitigation measures detailed in Section 5.6.2.3 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, slight** and **long-term**.

Air Emissions

As detailed in Chapter 9 (Air Quality), Section 9.9.2, dispersion modelling of traffic emissions at sensitive receptors in proximity to impacted road links during the operational phase indicates that pollutant emissions will be in compliance with the TII assessment criteria. As outlined in Section 9.7.2.1, the resulting impact on air quality and human health from increased traffic volumes during operation is assessed as **localised, direct, long-term, negative**, and **not significant**.

Noise and Vibration Emissions

Once operational noise emissions are controlled within the development site, noise emissions outside the site will be imperceptible. The residual noise effect is **neutral, not significant** and **long-term**.

The predicted change in noise levels associated with additional traffic is expected to be **neutral to negative, imperceptible to not significant**, and **long-term** along the existing road network.

Traffic and Transportation

The assessment of the additional traffic movements associated with the Proposed Development during the operational phase is presented in Chapter 14 (Material Assets - Transport). With the implementation of these additional mitigation measures, the overall residual operational-phase effect of the Proposed Development on the operation of the surrounding road network shall be **negative, not significant to moderate to significant** and **long-term**.

Major Accident Hazards and/or Natural Disasters

There are no significant potential impacts on Human Health from Major Accident Hazards and/or Natural Disasters; therefore, there are no residual impacts.

20.1.1.2 Cumulative

The potential for cumulative impact of the Proposed Development with any/all relevant other planned or permitted developments as outlined in Chapter 3 (Description of the Proposed Development) are discussed in Sections 5.9.1 and 5.9.2 for construction and operational phases.

The likely cumulative impact of the Proposed Development in conjunction with these cumulative developments upon health in relation to noise, dust generation, construction traffic, visual impacts, etc., associated with the works; have been assessed in the respective EIAR Chapters.

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 (2014) should the construction phase of the Proposed Development coincide with the construction phase of any other development within 500m then there is the potential for cumulative construction dust impacts. The dust mitigation measures outlined in Section 9.8.1 will be applied during the construction phase which will avoid significant cumulative impacts on air quality. With appropriate mitigation measures in place, the predicted cumulative impacts on air quality associated with the construction phase of the proposed development is short-term, negative, direct and not significant. No significant cumulative impacts to air quality predicted for the construction phase.

As noted in Chapter 12 (Noise and Vibration), if 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 the Proposed Development, noise levels from this site will dominate the noise environment when occurring in proximity to the noise sensitive locations along its immediate boundary. The noise contribution from other construction sites would need to be equal to those associated with the Proposed Development to result in any cumulative effect. Residual noise cumulative effects related to the construction phase, post-mitigation, are likely to be **short-term, negative and not significant to moderate**.

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 9 (Air Quality), Chapter 12 (Noise and Vibration) and Chapter 14 (Material Assets - Transport). 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.

As stated in Chapter 9 (Air Quality), 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 specific cumulative developments within the area (see Traffic and Transport Assessment and Chapter 14: Material Assets - Traffic & Transport for further details).

The cumulative operational phase impact is assessed within Section 9.7.2.1 and was found to have a neutral impact on air quality as per the TII significance criteria (Table 9.3) The cumulative operational stage impact is long-term, localised, direct, negative and not significant.

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 Chapter 12 (Noise and Vibration) 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.

As outlined in Chapter 14 (Material Assets - Transport), planning permission is in place for a number of committed developments in the vicinity of the subject site, some of which are currently under construction. Taking into account all relevant development areas as well as planned infrastructure such as new avenues, streets, and connections to the external network, no further cumulative impacts are anticipated.

20.1.2 Biodiversity (Chapter 6)

20.1.2.1 Proposed Development

The construction and operational mitigation proposed for the development satisfactorily addresses the mitigation of potential impacts on the sensitive receptors through the design and the application of construction and operational phase controls. In relation to bats, foraging within the site would be reduced and this would be considered to be a moderate adverse/negative/site/long term/ not significant impact on bats. In relation to birds, foraging within the site would be reduced, flights overhead would persist, and breeding habitat would decrease in the short/medium term but increase to similar or higher levels in the long-term and would be considered to be a net low adverse/negative/site/long term/ not significant impact on birds. In relation to mammals, available habitat within the site would be reduced and this would be considered to be a low adverse/negative/site/long term/ not significant impact on mammals. In relation to aquatic environment, following mitigation, and considering the integrity of the riparian zones will be maintained, surface water discharge to the Cunnicar and Castletown Streams will not result in a significant reduction in water quality within these waterbodies or the estuarine and marine environments to which they discharge, and this would be considered to be a negligible/neutral/site/long term/ not significant impact on the aquatic environment. The overall impact on the ecology of the proposed development will result in a low Adverse / Negative/ site/ not significant / long term impact on the ecology of the area and locality overall. This is primarily as a result of the loss of terrestrial habitats including arable land and hedgerows on site, supported by the creation of an improved biodiversity focused landscape plan incorporating additional biodiversity features, standard construction and operational controls and a sensitive native planting strategy.

20.1.2.2 Cumulative

It is concluded that no significant effects on designated conservation sites will be seen as a result of the proposed development alone or in combination with other projects.

20.1.3 Land, Soils and Geology (Chapter 7)

20.1.3.1 Proposed Development

Construction Stage

Implementation of the mitigation measures specified in Section 7.6 will ensure that the potential impacts of the proposed development on land, soils and the geological environment will be avoided, remedied or minimised. The residual impact is considered to be not significant for the construction phase and any residual impacts will be short term, and neutral.

The primary residual impact is the removal of material unsuitable for reuse as fill material. This impact is unavoidable given the nature of the proposed development. With the implementation of all mitigation measures these effects will be slight short-term effects that should have a neutral impact on the surrounding environment.

Operational Stage

There are no predicted impacts arising from the operational phase.

20.1.3.2 Cumulative Development

The cumulative residual impacts (after mitigation) described in Section 7.7 are the same as those identified in Section 7.5.4 — the proposed development will result in a permanent, neutral, and not significant impact on land, soils, and the geological environment once mitigation measures are in place.

20.1.4 Water (Chapter 8)

20.1.4.1 Proposed Development

Construction Stage

Implementation of mitigation measures specified in Section 8.6 will ensure that the potential effects of the proposed development on water and the hydrogeological environment do not occur during the construction phase and that any residual effects will be slight, short-term and have a neutral impact on the environment.

Operational Stage

As the surface water drainage design has been carried out in accordance with the GDSDS, and SuDS methodologies will be implemented as part of a treatment train approach, the predicted residual impacts on the water and hydrogeological environment arising from the operational phase are expected to be slight, long term and have a neutral effect on the development.

Worst Case Impact

The following unplanned events could potentially give rise to impact on the receiving water and hydrology:

- Flooding of the road network, preventing access by emergency services to all parts of the proposed development.
- Should the above event occur, it would be considered significant brief or short term and have a negative effect on the site. However, if the mitigation measures outlined in section 8.6 are adhered to then these issues will not likely occur.
- The attenuation areas for the site are designed to accommodate flood events up to 1% (100 year) AEP (Annual Exceedance Probability) with an additional 20% allowance for climate change. In events above this risk level, the surface water network is designed to provide overland flood routes along the various development roads towards the surface water drainage outfall therefore mitigating the risk.

20.1.4.2 Cumulative Development

No cumulative impacts are anticipated in relation to foul drainage and water supply in the construction and operations phases. The water and wastewater networks for the proposed development have been designed in accordance with the requirements of Uisce Éireann's codes of practice.

20.1.5 Climate (Air Quality) (Chapter 9)

20.1.5.1 Proposed Development

Construction Stage

Air Quality

Once the dust mitigation measures outlined in Section 9.8.1 are implemented, the impact of the proposed development in terms of dust soiling will be **direct, short-term, negative, localised** and **not significant** at nearby receptors.

Human Health

Best practice mitigation measures are proposed for the construction phase of the proposed development which will focus on the pro-active 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 of the proposed development will ensure that the impact of the development complies with all EU ambient air quality legislative limit values which are based on the protection of human health. Therefore, the impact of construction of the proposed development will be **direct, short-term, negative, localised** and **not significant** with respect to human health.

Operational Stage

Air Quality

Air dispersion modelling of operational traffic emissions associated with the proposed development was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO₂, PM₁₀ and PM_{2.5} at nearby sensitive receptors as a result of the proposed development will be 'neutral' in line with the TII assessment criteria (Table 9.3). Therefore, the operational phase impact to air quality is **long-term, direct, negative**, and **not significant**.

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. Section 9.7.2.1 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 **not significant** for the opening year. 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.

20.1.5.2 Cumulative

Construction Stage

According to the IAQM guidance (2024) should the construction phase of the proposed development coincide with the construction phase of any other developments within 500m then there is the potential for cumulative construction dust related impacts to nearby sensitive receptors. However, provided the mitigation measures outlined in Section 9.8.1, are implemented throughout the construction phase of the proposed development significant cumulative dust impacts are not predicted. Impacts are predicted to be **direct, short-term, negative, localised** and **not significant**.

Operational Stage

Air dispersion modelling of operational traffic emissions associated with the proposed development and cumulative developments in the wider area was carried out using the TII REM tool. The modelling assessment determined that the change in emissions of NO₂, PM₁₀ and PM_{2.5} at nearby sensitive receptors as a result of the proposed development in combination with cumulative developments will be neutral as per the TII descriptors in Table 9-3. Therefore, the operational phase impact to air quality is **long-term, direct, negative**, and **not significant**.

20.1.6 Climate (Climate Change) (Chapter 10)

20.1.6.1 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 ISEP 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 10.4, 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.

20.1.6.2 Cumulative

With respect to the requirement for a cumulative assessment the ISEP (ISEP, 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.

20.1.7 Climate (Daylight and Sunlight) (Chapter 11)

20.1.7.1 Proposed Development

During the design process the position and mass of the buildings, the finished floor level, and ridge and eaves levels were technically assessed to reduce any potential effect on the daylight and sunlight of adjacent properties. This informed the final design. Any residual effect on the daylight of the neighbouring properties is neutral.

Construction Stage

During the construction phase all scaffolding, hoarding and cranes will only be in use for as long as necessary to facilitate the construction of the proposed development. The effect of these is considered temporary and imperceptible.

Operational Stage

The effect on daylight to neighbouring buildings is not projected to change over the operational phase of the development.

20.1.7.2 Cumulative

Any residual effect on the daylight of the neighbouring buildings from the cumulative developments is neutral.

20.1.8 Air (Noise and Vibration) (Chapter 12)

20.1.8.1 Proposed Development

Construction Stage

During the construction phase of the proposed development, there is the potential for temporary to short-term noise impacts on nearby noise sensitive properties due to noise emissions from site activities. The application of binding noise limits and hours of work, along with implementation of appropriate noise and vibration control measures, will ensure that noise and vibration impact is kept to a minimum as far as practicable. For the duration of the construction period, construction noise impacts will be short-term and negative, depending on the proximity of the works to the site boundary. Along with the 5 dB reduction from partial screening from a suitable site hoarding it would be expected that a further 5 dB reduction would be achieved through on-site control measures, selection of quiet plant etc as per the mitigation described in Section 12.6.1.1.

The construction scenario is a robust assumption made for a development of this size, however at the site boundaries directly adjacent to permitted NSLs, it is unlikely 3 no. items of large plant/equipment would be operating simultaneously in such close proximity to each other at all times. In reality items of construction plant and machinery will be operating at varying distances from any one NSL. During break out works the residual effect is negative, significant to very significant and temporary at distances up to 50m) if all plant items were assumed to work simultaneously while adjacent to the closest building to an NSL. In line with DMRB Noise and Vibration (UKHE 2020) document, a significant effect relating to construction noise is deemed to occur where a moderate or major impact is likely to occur for a period of greater than 10 days/nights over 15 consecutive day/nights, or greater than 40 days over 6 consecutive months. In the case of this activity, it is unlikely the durations for significant effects will be exceeded and hence the overall significance of effects are categorised as *negative, moderate – significant and temporary*. At NSLs at greater than 50m distance, the CNT would not be exceeded and the residual significance of effect is *negative, not significant to moderate and short-term*.

Vibration effects of impact during the construction phase will be *negative, moderate to significant and short-term*.

Operational Stage

Additional Traffic on Roads

The predicted change in noise levels associated with additional traffic is expected to be ***neutral to negative, imperceptible to not significant, and long-term*** along the existing road network.

Building Services and Plant

The effect of impact from building services and plant is predicted to be *neutral, not significant and long term*.

Creche

The effect of impact from the creche related noise is predicted to be ***neutral, not significant and long term***.

20.1.8.2 Cumulative

The residual impacts presented in Section 20.1.8.1 are also applicable to the cumulative assessment.

20.1.8.3 Worst Case Impact

The impacts presented in the preceding sections have assessed the worst case and there is no variation in significance of the effects presented in 20.1.8.1.

20.1.9 Landscape and Visual Impact (Chapter 13)

20.1.9.1 Proposed Development

The predicted negative impacts as shown in photomontages 5, 6, 11, 11.1, 11.2, 12, 13, 15.1 & 16 are primarily short term at the construction stage where the land is transformed from agricultural use into a medium density residential area. The photomontages 1, 2, 3, 4, 7, 8, 9, 10 & 17 show that the proposed development is effectively screened by existing vegetation and buildings to the east beyond Mount Avenue Road, to the west beyond the initial section of Greyacre Road as it leaves the R934 Castletown Road, and to the south beyond the initial section of the R934 Castletown Road as it leaves the junction with the M1 Motorway.

The primary visual impacts are therefore restricted mainly to the Castletown Motte, to Cú Chulainn's Castle, to sections of Mount Avenue Road directly adjacent to the site, sections of Greyacre Road directly adjacent to the site, and to sections of the R934 Castletown Road directly adjacent to the site. This amounts to a relatively small area albeit these are areas where there is a national monument and its associated heritage elements, existing residential development, and busy roads. The mitigating factors include enhanced boundary treatments with existing trees, hedgerow and water courses to be retained and protected, a woodland walk riparian buffer zone along Greyacre Road, proposed new green infrastructure networks and the addition of wildlife corridors, and setting a buffer of land around the motte which has been zoned for open space uses and which will be developed as a heritage park including a network of green spaces with permeable links between each of the spaces.

Overall as the proposed development moves into the operational phase it is considered that the impact significance is moderate in that it is "an impact that alters the character of the environment in a manner that is consistent with the existing and emerging trends" and that the quality of the impact is neutral in that it constitutes "a change that does not affect the quality of the environment". It is further considered that the proposed development is in accordance with the various landscape and visual objectives, policies and land use zonings pertaining to the site and as set out in the Louth County Development Plan 2021 – 2027.

20.1.9.2 Cumulative

Construction Stage

Negative Temporary to Short Term Visual Impact.

Operational Stage

Moderate Neutral Medium to Long-Term Visual Impact.

20.1.10 Material Assets (Transport) (Chapter 14)

20.1.10.1 Proposed Development

Construction Stage

Provided the above mitigation 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 are detailed in Table 14.32 for the following key junctions:

- Junction 1 – Northern Site Access / Castletown Road

- Junction 2 –Eastern Site Access / Mount Avenue

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 - Draft (EPA, August 2017).

Junction	Environment Character	Quality / Scale of Impact	Impact Significance	Duration
14	Low Sensitivity	Negative - Low	Not Significant	Temporary
15	Low Sensitivity	Neutral	Imperceptible	Temporary

Table 20.1: Construction Impacts on Site Accesses

Operational Stage

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, interim and design years:

- 2027 Opening Year;
- 2032 Interim Year and
- 2042 Future Horizon Year

The following key junctions have been analysed as they exceeded the 5% threshold required under the Institution of Highways and Transportation document 'Guidelines for Traffic Impact Assessments':

- Junction 1 – Castletown Road / Mount Avenue (Priority Crossroads)
- Junction 2– M1 Junction 17 Western Roundabout
- Junction 3 – Castletown Road / Marian Park (Priority Junction)
- Junction 4 – Carrickmacross Road / Old Mount Avenue (Priority Junction)
- Junction 5 – Carrickmacross Road / Ard Easmuinn (Priority Junction)
- Junction 6 – Bellewsbridge Road / Mill Road (Priority Junction)
- Junction 7 – Castletown Road / Ecco Road (Signalised Junction)
- Junction 8 – M1 Junction 17 Eastern Roundabout
- Junction 9 – Castletown Road / Greyacre Road (Priority Junction)
- Junction 10 – Castletown Road / Bellewsbridge Road (Signalised Junction)
- Junction 11 – Mount Avenue / Headford (Priority Junction)
- Junction 12 – Mount Avenue Roundabout
- Junction 13 – Carrickmacross Road / New Mount Avenue (Signalised Junction)
- Junction 14 – Castletown Road / Site Access
- Junction 15 – Mount Avenue / Site Access

The operational assessment of the local road network has been undertaken using the Transport Research Laboratory (TRL) computer package PICADY (part of Junctions 10) for the priority junctions, ARCADY (part of Junctions 10) for the roundabouts, and TRANSYT for the signalised junctions.

For the PICADY and ARCADY analyses, a 90-minute AM and PM period has been simulated, from 08:00 to 09:30 and 16:45 to 18:15, respectively. For these junction analysis sets traffic flows were entered using an Origin-Destination table for the peak hours.

When considering priority junctions, a Ratio of Flow to Capacity (RFC) of greater than 85% (0.85) would indicate a junction to be approaching capacity, as operation above this RFC value is poor and the performance of the junction deteriorates quickly.

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

The evaluation of the operational performance of the key off site junctions following the implementation of the proposed residential scheme is summarised below for the Do Nothing (DN) and the Do Something (DS) scenario.

Existing – Do Nothing (DN): The potential level of traffic generated by committed developments and the existing baseline flows travelling across the network.

Proposed – Do Something (DS): The original development traffic in addition to the Base scenario (Existing – Do Nothing).

The evaluation of the operational performance of the key junctions across the local road network both prior to and following the implementation of the proposed residential development are summarised in Section 14.5.9 of this EIAR.

Impact Significance

The implementation of the mitigation measures outlined above, including the MMP, will ensure that the residual effect on the local receiving environment is both managed and minimised.

With regards to the TII thresholds, the above junctions are indicated as having impacts above 5%, and therefore have been subject to detailed analysis. This detailed analysis has been covered in Section 14.5.9 in line with the criteria set out within the Guidelines on the Information to be Contained in Environmental Impact Assessment Reports – Draft (EPA, August 2017).

The significance of each of the projected impacts at each of the key nodes after the introduction of the identified mitigation works is detailed within the following table for the adopted worst case (e.g. peak hours) 2042 Future Year scenarios.

Junction	Environment Character	Environment Character	Quality / Scale of Impact	Impact Significance	Duration
1	AM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
	PM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
2	AM	Low Sensitivity	Negative - Low	Not Significant	Medium-term
	PM	Low Sensitivity	Negative - Low	Not Significant	Medium-term
3	AM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
	PM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
4	AM	Low Sensitivity	Negative - Low	Slight	Medium-term
	PM	Low Sensitivity	Negative - Low	Slight	Medium-term
5	AM	Low Sensitivity	Negative - Low	Not Significant	Medium-term
	PM	Low Sensitivity	Negative - Low	Not Significant	Medium-term
6	AM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
	PM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
7	AM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
	PM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
8	AM	Low Sensitivity	Negative - Low	Slight	Medium-term
	PM	Low Sensitivity	Negative - Low	Slight	Medium-term
9	AM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
	PM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
10	AM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
	PM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
11	AM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
	PM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
12	AM	Low Sensitivity	Negative - High	Significant	Medium-term
	PM	Low Sensitivity	Negative - High	Significant	Medium-term
13	AM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
	PM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
14	AM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
	PM	Low Sensitivity	Negative - Medium	Moderate	Medium-term
15	AM	Low Sensitivity	Negative - High	Significant	Medium-term
	PM	Low Sensitivity	Negative - High	Significant	Medium-term

Table 20.2: Impact Significance – 2042 Design Year

20.1.10.2 Cumulative

The analysis detailed above represents an appraisal in terms of potential cumulative impacts for a typical weekday as it is focused upon the key two busiest periods of the day (e.g. AM and PM peak hours). During the other 22 hours of the day, traffic flows are predicted to be significantly lower resulting in the network operating with additional reserve capacity to that forecast for the peak hour periods.

Furthermore, if any of the adjacent zoned lands in the area were to be developed, aside from those included as a committed development, this would have an effect on the local road network. However, the scale of any potential impact would be fully assessed during the planning procedures for any of these individual third-party developments (which currently do not benefit from planning permission).

Nevertheless, the utilisation of TII's growth rates does take some account of the potential additional traffic that such third party sites could generate. The TII Project Appraisal Guidelines (PAG) have been utilised to determine the traffic growth forecast rates for Louth as outlined in Section 14.5.2 of this EIAR. The traffic growth forecast rates within the PAG ensures local and regional variations and demographic patterns are accounted for.

20.1.11 Material Assets (Waste) (Chapter 15)

20.1.11.1 Proposed Development

Construction Stage

The residual effects of the Proposed Development on waste management are considered to be slight, neutral, direct and short-term, this is due to:

- The prevention and mitigation measures proposed within this chapter and other chapters of the EIAR;
- Compliance with national legislation and the allocation of adequate time and resources dedicated to efficient waste management practices; and
- Continued use of permitted/licensed waste hauliers and facilities. Waste removed from the facility will be managed appropriately and will avoid environmental effects or pollution. In addition, the correct management and storage of waste will avoid litter or pollution issues at the site.

Operational Stage

During the operational phase, waste will be generated on an ongoing basis from the residential, commercial, childcare, and medical uses within the Proposed Development. These waste streams will primarily consist of municipal waste types including organic waste, DMR, MNR and glass. Additional waste types, including occasional hazardous and healthcare-related waste from the medical unit, WEEE, batteries and bulky items, may also arise occasionally.

Careful management of these, including segregation at source within residential, commercial, and medical units, will help to ensure a high level of waste recycling, reuse, and recovery at the Proposed Development. The OWMP (AWN, 2025b) sets out a comprehensive strategy for the segregation, storage and collection of operational waste. Waste will be segregated at source within individual units and transferred to a designated WSA, which have been incorporated into the site layout. Shared WSAs will be provided for the apartment blocks, commercial units, the crèche, and the medical unit, while individual WSAs will be allocated for houses and duplexes. All receptacles will be colour coded and clearly labelled to prevent cross-contamination.

Waste will be collected on a weekly basis by appropriately permitted waste contractors and transported to licensed or permitted facilities. The Facilities Management Company will oversee the

implementation of the OWMP, including frequent inspections of WSAs and maintenance of a waste register to track quantities and types of waste collected.

With the implementation of the OWMP, the Proposed Development is expected to achieve high levels of recycling, reuse, and recovery, with maximum diversion of waste from landfill. The provision of adequate waste infrastructure and management practices will minimise the potential for environmental effects such as littering, odour, or contamination of soil and water.

The likely residual effect of the operational phase on waste management is considered to be neutral, direct, and slight in the long-term.

20.1.11.2 Cumulative

Construction Stage

Other consented developments currently in their construction phases within the area will be required to comply with their respective planning conditions and as such, it is assumed that the effects will be short term, not significant and neutral.

Operational Stage

There will be an increase in operation waste during the operational stage of the Proposed Development. With the implementation of mitigation measures as detailed in section 15.6.2, the likely cumulative effect will be long term imperceptible and neutral.

20.1.12 Material Assets (Utilities) (Chapter 16)

20.1.12.1 Proposed Development

Construction Stage

Implementation of the measures specified in 16.6 will ensure that the potential impacts of the proposed development on water supply, drainage and utilities do not occur during the construction phase and that any residual impacts will be moderate, short term and will have a neutral effect on the proposed development.

Operational Stage

As surface water drainage, foul water drainage and watermain design has been carried out in accordance with the relevant guidelines, there are no predicted residual impacts on the drainage and water supply arising from the operational phase.

All utilities ducting and diversion will be carried out as per the supplier standards and instructions, therefore the residual impacts are expected to be permanent but imperceptible from the operational phase and will have a neutral impact on the development.

Worst-Case Scenario

Contamination of potable water supply. This risk is not considered significant as water The following accidents & disasters involving built services during construction could potentially give rise to a serious incident putting people at risk:

- Excavation works coming into contact with live electricity lines.
- Excavation works causing damage and leaks to gas mains.
- Excavation works causing damage to wastewater pipelines and resulting in contamination of the surrounding ground and surface water network.
- Accidental spills of fuels, oils, and construction material could contaminate the watercourse.

- Employee and public safety. Working in or near river flows poses risks of worker injury or accidents, including the potential for accidental drowning

A site-specific CEMP will be developed and implemented during the construction phase to mitigate the risks associated with accidents and disasters.

The following accidents & disasters involving built services during operation could potentially give rise to a serious incident putting end users at risk:

- Gas explosions. The installation of services is tightly monitored and controlled by Gas Networks Ireland to ensure the protection of human health. The probability of this event occurring is unlikely. Therefore, the risk of effect on human health is not considered significant.
- Quality is tightly monitored by Irish Water. The probability of this event occurring is unlikely. Further consideration is given to this in Chapter 8 of this report.

20.1.12.2 Cumulative

Construction Stage

Implementation of the measures specified in 16.6 will ensure that the potential cumulative impacts on water supply, drainage and utilities do not occur during the construction phase and that any residual impacts will be moderate, short term and will have a neutral effect on the proposed development.

Operational Stage

As surface water drainage, foul water drainage and watermain design has been carried out in accordance with the relevant guidelines, there are no predicted cumulative residual impacts on the drainage and water supply arising from the operational phase.

All utilities ducting and diversion will be carried out as per the supplier standards and instructions, therefore the residual impacts are expected to be permanent but imperceptible from the operational phase and will have a neutral impact.

Worst-Case Scenario

The proposed surface water drainage infrastructure has been designed in accordance with the relevant guidelines. Any other future development in the vicinity of the site would have to be similarly designed in relation to permitted surface water discharge, surface water attenuation and SuDS, therefore, no potential cumulative impacts are anticipated in relation to surface water drainage and flooding.

No potential cumulative impacts are anticipated in relation to wastewater as the proposed orbital sewer has been designed in accordance with the requirements of Uisce Éireann's Code of practice for wastewater.

No potential cumulative impacts are anticipated in relation to water supply as the proposed watermain network has been designed in accordance with the requirements of Uisce Éireann's code of practice for water infrastructure.

Without the consideration of mitigation measures the construction phase of the proposed development will likely have a neutral, short-term, slight cumulative impact.

Without the consideration of mitigation measures the operational phase of the proposed development will likely have a neutral, permanent, imperceptible cumulative impact.

20.1.13 Cultural Heritage (Archaeological & Architectural) (Chapter 17)**20.1.13.1 Proposed Development****Construction Stage**

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

Operational Stage

Following the completion of the mitigation measures, there will be a slight positive residual impact on the recorded motte and bailey castle and standing stone.

Worst-Case Scenario

Under a worst-case scenario, the proposed development would disturb previously unrecorded and unidentified archaeological deposits and artefacts without proper excavation and recording being undertaken.

20.1.13.2 Cumulative

All permitted and proposed developments within the study area have been assessed in conjunction with the proposed development. No cumulative residual impacts have been identified in relation to the cultural heritage resource.

20.1.14 Risk Management (Major Accidents & Disasters) (Chapter 20)

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.