9. AIR QUALITY

9.1 Introduction

MKO prepared the Air Chapter of this Environmental Impact Assessment Report (EIAR) for the Proposed Development at Knocknacarra, Co. Galway.

This Chapter identifies, describes and assesses the potential significant direct and indirect effects on air quality arising from the construction and operational phases of the Proposed Development. Where required, appropriate mitigation measures to mitigate any identified significant effects to air quality are recommended. A full description of the Proposed Development is outlined in Chapter 4 of this EIAR.

9.1.1 Statement of Authority

This section of the EIAR has been prepared by Tom Madden and reviewed by Eoin O Sullivan, both of MKO. Tom is an Project Environmental Scientist and has over five years working in various Environmental Consultancies throughout Ireland. He holds a BSc (Hons) in Environmental Science from the University of Limerick. Eoin O'Sullivan is a Project Director at MKO with over 15 years of experience in the environmental assessment of a wide range of energy and infrastructure related projects and working in the fields of environmental and human health risk assessment, waste management, waste policy and permitting. Eoin has also experience in completing Environmental Impact Assessment Reports for renewable energy projects, quarries and a number of non-hazardous landfill sites and anaerobic digesters for both public and private clients. Eoin holds a BSc (Hons) in Environmental Science & Technology and an MSc in Environmental Engineering. Eoin's key strengths include project strategy advice for a wide range and scale of projects, project management and liaising with the relevant local authorities, Environmental Protection Agency (EPA) and statutory consultees as well as coordinating the project teams and sub-contractors. Eoin is a Chartered Member of the Chartered Institute of Water and Environmental Management and Chartered Environmentalist with the Society of Environment.

9.1.2 Background

The Proposed Development site which covers an area of 5.37 hectares (ha) will consist of a mix of residential units, open spaces, creche and all other site related infrastructure. The Proposed Development is a component of a larger residential development project (Proposed Project). The Proposed Project involves the construction of more than 500 residential units, and the development will require separate, individual planning applications for each part of the project.

The Proposed Development site is located south of the Western Distributor Road, Knocknacarra, Galway approximately 3 kilometre (km) west of Galway City Centre. Currently, the site is comprised of a mixture of agricultural grassland and areas of brownfield. Stone walls and treelines are also present within the Proposed Development site boundary. The surrounding area is urban in character with a number of residential housing estates and commercial and industrial buildings being located in close proximity.

Due to the non-industrial nature of the Proposed Development and the general character of the surrounding environment, air quality sampling was deemed to be unnecessary for this EIAR. It is expected that air quality in the existing environment is good, since there are no major sources of air pollution (e.g. heavy industry) in the vicinity of the site.

9.1.3 Relevant Guidance and Legislation

The Air Chapter of this EIAR has been completed in accordance with the EIA Directive 2011/92/EU as amended by Directive 2014/52/EU and having regard, where relevant, to guidance listed below:

- Air Quality Assessment of Proposed National Roads – Standard PE-ENV-01102 (Transport Infrastructure Ireland, December 2022).
- Guidelines on the Information to be contained in Environmental Impact Assessment Reports – May 2022 (EPA, 2022).
- Environmental Impact Assessment of Projects: Guidance on the preparation of the Environmental Impact Assessment Report (EC, 2017).
- Air Quality in Ireland Report 2024 (EPA, 2025).
- Best Practice Guidelines on the Preparation of Resource and Waste Management Plans for Construction & Demolition Projects (EPA, 2021).
- Guidance of the Assessment of Dust from Demolition and Construction (IAQM, 2024).
- Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes (TII, 2011).
- Guidelines for Assessment of Ecological Impacts of National Roads Schemes (TII, 2009).
- Clean Air Strategy for Ireland (Government of Ireland, 2023).
- UK Department of Environment Food and Rural Affairs (DEFRA) Part IV of the Environment Act 1995: Local Air Quality Management, LAQM.TG (16) (DEFRA 2018).
- UK Highways Agency (UKHA) Design Manual for Roads and Bridges (DMRB) – LA 105 Air Quality (UKHA, 2019).
- World Health Organization (WHO) Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulfur Dioxide Global Update 2005 (WHO 2005).

9.1.4 Limitations and Difficulties Encountered

No limitations or difficulties were encountered during the preparation of the Air Chapter of the EIAR.

9.2 Air Quality

9.2.1 Relevant Legislation

In 1996, the Air Quality Framework Directive (on ambient air quality assessment and management) (96/62/EC) was published. This Directive was transposed into Irish law by the Environmental Protection Agency Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (S.I. No. 33 of 1999). The Directive was followed by four Daughter Directives, which set out limit values for specific pollutants:

- The first Daughter Directive (1999/30/EC) addresses sulphur dioxide, oxides of nitrogen, particulate matter and lead.
- The second Daughter Directive (2000/69/EC) addresses carbon monoxide and benzene. The first two Daughter Directives were transposed into Irish law by the Air Quality Standards Regulations 2002 (SI No. 271 of 2002).
- The third Daughter Directive, Council Directive (2002/3/EC) relating to ozone was published in 2002 and was transposed into Irish law by the Ozone in Ambient Air Regulations 2004 (SI No. 53 of 2004).
- The fourth Daughter Directive (2004/107/EC), published in 2004, relates to polyaromatic hydrocarbons (PAHs), arsenic, nickel, cadmium and mercury in ambient air and was transposed into Irish law by the Arsenic, Cadmium, Mercury,

Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2009 (S.I. No. 58 of 2009) (amended by SI 659/2016 - Air Quality Standards (Amendment) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air (Amendment) Regulations 2016.)

The Air Quality Framework Directive and the first three Daughter Directives have been replaced by the Clean Air for Europe (CAFE) Directive (Directive 2008/50/EC on ambient air quality and cleaner air for Europe) (as amended by Directive EU 2015/1480) which encompasses the following elements:

- The merging of most of the existing legislation into a single Directive (except for the Fourth Daughter Directive) with no change to existing air quality objectives.
- New air quality objectives for PM2.5 (fine particles) including the limit value and exposure concentration reduction target.
- The possibility to discount natural sources of pollution when assessing compliance against limit values.
- The possibility for time extensions of three years (for particulate matter PM10) or up to five years (nitrogen dioxide, benzene) for complying with limit values, based on conditions and the assessment by the European Commission.

Table 9-1 below sets out the limit values of the CAFE Directive, as derived from the Air Quality Framework Daughter Directives. Limit values are presented in micrograms per cubic metre ($\mu g/m^3$) and parts per billion (ppb). The notation PM_{10} is used to describe particulate matter or particles of ten micrometres or less in aerodynamic diameter. $PM_{2.5}$ represents particles measuring less than 2.5 micrometres in aerodynamic diameter.

The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) as amended by the Air Quality Standards (Amendments) and Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations, 2016 (S.I. 659 2016). The 2011 Regulations superseded the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and the Ambient Air Quality Assessment and Management Regulations 1999 (S.I. No. 33 of 1999). The Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011) was revoked on 31 December 2022 and has been replaced by the Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022).

On 10th December 2024, Directive (EU) 2024/2881 on ambient air quality and cleaner air for Europe came into force. This directive recasts Directive 2008/50/EC (the CAFE Directive) and the fourth Daughter Directive (Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air) and incorporates them into a single directive. This recast directive sets out limit values, target values, average exposure reduction obligations, average exposure concentration objectives, critical levels, alert thresholds, information thresholds and long-term objectives. It sets out air quality provisions with the aim of achieving the objectives of the European Commission's Zero Pollution Action Plan, so that air pollution within the EU is progressively reduced to levels no longer considered harmful to health and natural ecosystems at the latest by 2050. At the time of writing Directive (EU) 2024/2881 has not yet been transposed into Irish law.

9.2.2 Air Quality Standards

The Ambient Air Quality Standards Regulations 2022 (S.I. No. 739/2022) remains aligned to the CAFÉ Directive and diverts to the CAFÉ Directive for the limit values outlined in Table 9-1, the assessment thresholds in Table 9-2, the ozone limits and assessment thresholds in Table 9-3 and Table 9-4, respectively.

Table 9-1 Limit values of the CAFE Directive 2008/50.EC, (Source: https://airquality.ie/information/air-quality-standards)

Pollutant	Limit Value Objective	Averaging Period	Limit Value (ug/m^3)	Basis of Application of Limit Value	Attainment Date
Sulphur dioxide (SO_2)	Protection of Human Health	1 hour	350	Not to be exceeded more than 24 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of human health	24 hours	125	Not to be exceeded more than 3 times in a calendar year	1st Jan 2005
Sulphur dioxide (SO_2)	Protection of vegetation	Calendar year	20	Annual mean	19th Jul 2001
Sulphur dioxide (SO_2)	Protection of vegetation	1st Oct to 31st Mar	20	Winter mean	19th Jul 2001
Nitrogen dioxide (NO_2)	Protection of human health	1 hour	200	Not to be exceeded more than 18 times in a calendar year	1st Jan 2010
Nitrogen dioxide (NO_2)	Protection of human health	Calendar year	40	Annual mean	1st Jan 2010
Nitrogen monoxide (NO) and nitrogen dioxide (NO_2)	Protection of ecosystems	Calendar year	30	Annual mean	19th Jul 2001
Particulate matter 10 (PM_{10})	Protection of human health	24 hours	50	Not to be exceeded more than 35 times in a calendar year	1st Jan 2005
Particulate matter 10 (PM_{10})	Protection of human health	Calendar year	40	Annual mean	1st Jan 2005
Particulate matter 2.5 ($PM_{2.5}$) Stage 1	Protection of human health	Calendar year	25	Annual mean	1st Jan 2015

Pollutant	Limit Value Objective	Averaging Period	Limit Value (ug/m^3)	Basis of Application of Limit Value	Attainment Date
Particulate matter 2.5 ($PM_{2.5}$) Stage 2	Protection of human health	Calendar year	20	Annual mean	1st Jan 2020
Lead	Protection of human health	calendar year	0.5	Annual mean	1st Jan 2005
Carbon Monoxide	Protection of human health	8 hours	10,000	Not to be exceeded	1st Jan 2005
Benzene	Protection of human health	calendar year	5	Annual mean	1st Jan 2010

Table 9-2 Assessment Thresholds from CAFE Directive 2008/50/EC

Pollutant	Limit Value Objective	Averaging Period	Limit Value (µg/m^3)	Basis of Application of Limit Value
Sulphur dioxide (SO_2)	Upper assessment threshold for the protection of Human Health	24 hours	75	Not to be exceeded more than 3 times in a calendar year
Sulphur dioxide (SO_2)	Lower assessment threshold for the protection of human health	24 hours	50	Not to be exceeded more than 3 times in a calendar year
Nitrogen dioxide (NO_2)	Upper assessment threshold for the protection of human health	1 hour	140	Not to be exceeded more than 18 times in a calendar year
Nitrogen dioxide (NO_2)	Lower assessment threshold for the protection of human health	1 hour	100	Not to be exceeded more than 18 times in a calendar year
Particulate matter 10 (PM_{10})	Upper assessment threshold	24 hours	35	Not to be exceeded more than 35 times in a calendar year
Particulate matter 10 (PM_{10})	Lower assessment threshold	24 hours	25	Not to be exceeded more

Pollutant	Limit Value Objective	Averaging Period	Limit Value (µg/m^3)	Basis of Application of Limit Value
				than 35 times in a calendar year
Lead (Pb)	Upper assessment threshold	Calendar Year	0.35	-
Lead (Pb)	Lower assessment threshold	Calendar Year	0.25	-
Carbon Monoxide (CO)	Upper assessment threshold	8 hours	7000	-
Carbon Monoxide (CO)	Lower assessment threshold	8 hours	5000	-
Benzene (C_6H_6)	Upper assessment threshold	Calendar Year	3.5	-
Benzene (C_6H_6)	Lower assessment threshold	Calendar Year	2	-

Ozone is set out differently in the CAFE Directive in that it sets target values and long-term objectives for ozone rather than limit values. Table 9-3 presents the target values and long-term target value for ozone and Table 9-4 details the threshold values for Ozone.

Table 9-3 Target values for Ozone defined in Directive 2008/50/EC

Objective	Parameter	Target Value for 2010	Long-term Target Value from 2020
Protection of human health	Maximum daily 8-hour mean	120 µg/m^3 not to be exceeded more than 25 days per calendar year averaged over 3 years	120 µg/m^3
Protection of vegetation	AOT40* calculated from 1-hour values from May to July	18,000 µg/m^3.h averaged over 5 years	6,000 µg/m^3.h

* AOT40 is a measure of the overall exposure of plants to ozone. It is the sum of the excess hourly concentrations greater than 80 µg/m3 and is expressed as µg/m3 hours.

Table 9-4 Threshold for Ozone Defined in Directive 2008/50/EC (Source: https://airquality.ie/information/air-quality-standards and Directive 2008/50/EC)

Pollutant	Averaging Period	Threshold
Information Threshold	1-hour average	180 µg/m^3
Alert Threshold	1-hour average	240 µg/m^3

9.2.2.1 Air Quality and Health

In September 2025, the EPA published *'Air Quality in Ireland 2024'*[1] which reports that although Ireland met the current EU legal air quality limits in 2024, Ireland is falling behind on the targets set in Ireland's Clean Air Strategy (discussed below) for 2026. The Air Quality in Ireland Report 2024 also reports that monitoring results were higher than the more stringent health-based World Health Organization air quality guidelines for a number of pollutants including: particulate matter (PM), nitrogen dioxide (NO^2), sulphur dioxide (SO^2) and ozone (O^3). PM and NO^2 are the most significant pollutants in Ireland. The main sources of these pollutants are the burning of solid fuel in our towns and villages and traffic in our cities. People's health and the health of our environment is impacted by these pollutants

The European Environment Agency (EEA) published a briefing on Europe's air quality status in April 2024[2]. This briefing presented the status of concentrations of pollution in ambient air in 2022 and 2023 for regulated pollutants in relation to both EU air quality standards and the 2021 WHO guideline levels. The assessment shows that, in spite of constant improvements, exceedances of air quality standards are common across the EU, with concentrations well above the latest WHO recommendations.

The EEA Report, *Air Quality in Europe 2023,* highlights the negative effects of air pollution on human health across the EU. The report concluded that in 2021, exposure to air pollution in the EU-27 member countries led to:

- 253,000 deaths were attributable to exposure to PM2.5 concentrations above the World Health Organisation (WHO) guideline level of 5 µg/m^3.
- 52,000 deaths were attributable to exposure to NO_2 concentrations above the WHO's guideline level of 10 µg/m^3.
- 22,000 deaths were attributable to short-term exposure to O^3 concentrations above 70 µg/m^3.

These figures are further informed by the EEA publication of '*Ireland – Air Pollution Country Fact Sheet 2024*' on the 10th December 2024[3]. This states that 530 Irish deaths were attributable to fine particulate matter ($PM_{2.5}$), 100 Irish deaths were attributable to nitrogen oxides (NO_2) and 240 Irish deaths were attributable to Ozone (O_3).

More recently a few key messages are outlined in the 'Air Quality Status Report 2025' published on the 9th April 2025 on the EEA website[4]. These are:

- EU air quality standards are still not fully met across Europe, despite ongoing overall improvements.

[1] *Air Quality in Ireland Report 2024. Available at: https://www.epa.ie/publications/monitoring--assessment/air/EPA-Air-Quality-in-Ireland-Report-2024-INTERACTIVE.pdf*
[2] *Europe's air quality status 2024. Available at: https://www.eea.europa.eu/publications/europes-air-quality-status-2024*
[3] *Ireland – air pollution country fact sheet 2024. Available at: Ireland – air pollution country fact sheet 2024 | European Environment Agency's home page*
[4] *Air quality status report 2025. Available at: Air quality status report 2025 | European Environment Agency's home page*

- Since 2011, all countries have reduced exposure of their urban population to fine $PM_{2.5}$ particles, the most harmful pollutant from a health perspective. Nevertheless, the vast majority (94%) of the EU urban population remains exposed to $PM_{2.5}$ concentrations above the WHO guideline level, highlighting the need for additional measures to reduce the associated health risks.
- Many locations already have air quality concentrations below the new EU 2030 standards. But in order to meet these new standards everywhere, and based on current progress, additional measures to improve air quality, especially in cities, are likely to be needed.

In May 2025, the EPA published *Irelands Air Pollutant Emissions 1990 - 2030* [5]. This report provides details of emissions of air pollutants in Ireland in the period 1990 to 2023 and projected emissions of these pollutants for 2030 to give an indication of the likelihood of compliance with future emission reduction commitments. The Revised Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone[6], adopted in 2012, sets out national reduction commitments for 2020 and beyond for sulphur dioxide (SO_2), nitrogen oxides (NO_x), volatile organic compounds (VOCs), ammonia (NH_3) and particulate matter < 2.5 µm ($PM_{2.5}$). The EU has implemented the provisions of this protocol via the National Emission reduction Commitments Directive (Directive (EU) 2016/2284) (NECD), which was transposed into Irish law via S.I. No. 232/2018, setting out emissions reduction commitments (ERC) for the five air pollutants. Mitigation measures to achieve compliance with the emissions reduction commitments out to 2030 are outlined in the *National Air Pollution Control Programme 2024*[7] (NAPCP) and *Clean Air Strategy*. The projected emissions out to 2030 are under two scenarios, *With Existing Measures (WEM)* and *With Additional Measures (WAM).* The WEM scenario assumes that no future policy actions are taken beyond those already implemented by 2023, the latest inventory year. The WAM scenario includes additional planned policies and measures beyond 2023, such as the programmes of policies and measures set out in the *Climate Action Plans 2021, 2023 and 2024,* the implementation of the *AgClimatise*[8] roadmap and the *Teagasc Marginal Abatement Cost Curves (MACC)*[9].

The Irelands Air Pollutant Emissions 1990 - 2030 report found that Ireland is compliant with the current and future emissions reductions commitments however, the following will apply:

- The ERC for NOx requires full implementation of measures in the NAPCP, Clean Air Strategy and Climate Action Plan.
- The ERC for Non-Methane Volatile Organic Compounds (NMVOC) requires mitigation, and further research is needed on the broader range of NMVOC sources.
- The achievement of the ERC for NH3 depends on maintaining progress in implementation of ammonia abatement measures, as outlined in the AgClimatise plan, Teagasc Marginal Abatement Cost Curves (MACC), 2023 and 2024 Climate Action Plans, and current NAPCP.
- Compliance with the ERC for $PM_{2.5}$ is projected.
- Compliance with the ERC for SO_2 is projected.

These emissions, along with others including sulphur oxides, carbon monoxide, benzene and lead are produced during fossil fuel-based electricity generation and traffic, with emissions varying depending on the type of fuel and technology used. Whilst there is the potential of such emissions to be generated from the Proposed Development, a number of mitigation measures will be implemented at this site to reduce the effect from dust and vehicle emissions. These measures are outlined in Section 9.4.

[5] *Irelands Air Pollutant Emissions 1990 – 2030. Available at: Ireland's Air Pollutant Emissions*
[6] *The Revised Gothenburg Protocol to Abate Acidification, Eutrophication, and Ground-level Ozone. Available at: https://unece.org/environmental-policy/air/protocol-abate-acidification-eutrophication-and-ground-level-ozone#:~:text=The%20Protocol%20establishes%20national%20emission,%2C%20VOCs%2C%20and%20NO%E2%82%93%20emissions.*
[7] *National Air Pollution Control Programme Report. Available at: national-air-pollution-control-programme-report-2024.pdf*
[8] *AgClimatise plan. Available at: Ag Climatise - A Roadmap towards Climate Neutrality*
[9] *Teagasc Marginal Abatement Cost Curve 2023. Available at: Marginal Abatement Cost Curve 2023 - Teagasc | Agriculture and Food Development Authority*

9.2.2.2 Clean Air Strategy for Ireland 2023

Ireland's *Clean Air Strategy 2023*[10] sets out the detail of seven strategic frameworks designed to ensure continued improvement in air quality. The aims of these key strategic frameworks are:

- To set the appropriate targets and limits to ensure continuous improvements in air quality across the country, to deliver health benefits for all.
- To ensure the integration of clean air considerations into policy development across Government.
- To increase the evidence base that will help us to continue to evolve our understanding of the sources of pollution and their impacts on health, in order to address them more effectively.
- To enhance regulation required to deliver improvements across all pollutants.
- To improve the effectiveness of our enforcement systems.
- To promote and increase awareness of the importance of clean air, and the links between cleaner air and better health.
- To develop the additional targeted/specific policy measures as required to deal with national or local air quality issues.

Figure 9-1 Seven Strategic Frameworks for Air Quality, with associated chapters in brackets. Reproduced as Figure 1 from Clean Air Strategy 2023

Chapter 11 of the *Clean Air Strategy* discusses Air Quality Policy Development. It highlights the importance of energy policy and acknowledges that Ireland's accelerated transition to renewable electricity is crucial for meeting the ambitious renewable energy and greenhouse gas (GHG) emission reduction targets set by the European Green Deal and Ireland's *Climate Action Plan 2023*. This transition will also be key to addressing security of supply risks and phasing out fossil fuels from power generation.

Wind (offshore and onshore) and solar energy are identified as the leading cost-effective technologies to help achieve our energy and emissions targets. These renewable sources will also contribute to reducing emissions in other sectors, including household heating and vehicle transport. While *Clean Air Strategy* references the *Climate Action Plan 2023*, it is important to note that the most recent version is the *Climate Action Plan 2025*. Both the *Climate Action Plan 2025* and the European Green Deal aim to achieve net-zero GHG emissions by 2050 and reduce GHG emissions to at least 55% by 2030, compared to 1990 levels.

[10] *Rialtas na hÉireann Clean Air Strategy April 2023. Available at: https://www.gov.ie/en/publication/927e0-clean-air-strategy/#:~:text=The%20Clean%20Air%20Strategy%20provides,delivering%20on%20wider%20national%20objectives.*

9.3 Methodology

9.3.1 Air Quality Zones

The air quality zone for the Proposed Development was selected, followed by a review of EPA collated baseline air quality data namely Sulphur Dioxide (SO_2), Particulate Matter (PM_{10}), Nitrogen Dioxide (NO_2), Carbon Monoxide (CO) and Ozone (O_3) for the selected air quality zone to determine the representative levels of such emissions for the Proposed Development.

The EPA has designated four Air Quality Zones for Ireland:

- Zone A: Dublin City and environs
- Zone B: Cork City and environs
- Zone C: 16 urban areas with population greater than 15,000
- Zone D: Remainder of the country.

These zones were defined to meet the criteria for air quality monitoring, assessment and management described in the CAFE Directive. The site of the Proposed Development lies within Zone C.

9.3.2 Air Quality Data Review

The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent report on air quality in Ireland, *Air Quality in Ireland 2024*[1], was published by the EPA in 2025. The EPA reports provide SO_2, PM_{10}, NO_2 and O_3 concentrations for areas in Zone C. These are detailed in Section 9.3.

9.3.3 Dust

The Institute of Air Quality Management in the UK (IAQM) guidance document *Guidance on the Assessment of Dust from Demolition and Construction* (2024)[11] was considered in the dust impact assessment. The guidance document outlines an assessment method for predicting the impact of dust emissions from construction activities based on the scale and nature of the works and the sensitivity of the area to dust impacts. This methodology has been used to predict the likely risk of dust as a result of the construction phase works and operational phase activities. The use of UK guidance is considered best practice in the absence of applicable Irish guidance. The major dust generating activities are divided into four types within the IAQM (2024) guidance to reflect their different potential impacts. These are:

- Demolition
- Earthworks
- Construction
- Trackout - The transport of dust and dirt from the construction / demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when Heavy Goods Vehicles (HGVs) leave the construction / demolition site with dusty materials, which may then spill onto the road, and/or when HGVs transfer dust and dirt onto the road having travelled over muddy ground on site.

[11] *Institute of Air Quality Management (IAQM), 2024. Guidance on the Assessment of Dust from Demolition and Construction. Version 2.2. [online] Available at: https://iaqm.co.uk/guidance/*

The magnitude of dust generating activities is divided into 'Large', 'Medium' or 'Small' scale depending on the nature of the activities involved. IAQM (2024) guidance provides example definitions for the scale of the activities, and these are applied for this development as outlined in Table 9-5.

Table 9-5 Description of Magnitude for nature of activities (Adapted from: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, pages 16 & 17)

	Large	Medium	Small
Demolition	Total building volume >75,000 m^3, potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >12 m above ground level	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12m above ground level	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months
Earthworks	Large: Total site area >110,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >6 m in height	Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m - 6m in height	Total site area <18,000 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3 m in height
Construction	Total building volume >75,000 m^3, on site concrete batching, sandblasting	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)
Trackout	>50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m	20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m	<20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m
	Note: A vehicle movement is a one way journey. i.e. from A to B and excludes the return journey. HDV movements during a construction project vary over its lifetime, and the number of movements is the maximum not the average		

There are two existing buildings within the site which will be demolished as part of the Proposed Development. Both buildings are classified as outbuildings. The demolition requirements for the Proposed Development are classified as 'Small' given the materials to be demolished (predominantly concrete blocks, timber, metal) and the total size of the existing buildings to be demolished.

The earthwork requirements for the Proposed Development are classified as "Medium" for the total earthworks. The total area of the site is 5.37 hectares which equates to 53,700 m^2.

The construction requirements for the Proposed Development are classified as "Large". This is primarily in relation to the number of proposed residential dwellings to be built (being 362) and the associated works.

As outlined in Chapter 15 Material Assets of this EIAR and the Traffic and Transport Assessment (TTA) which has been prepared by Tobins Consulting Engineers, it is estimated that HGV movements during peak construction periods will not exceed 20 one-way trips (40 trips total). This would result in a" Medium" classification for Trackout.

The magnitude of each activity is combined with the overall sensitivity of the area to determine the risk of dust impacts from site activities.

9.3.3.1 Defining the Sensitivity of the Area

For the purposes of this assessment:

High Sensitivity Receptors

- Residential properties, museums and other locations where people are present for continuously, or regularly for extended periods, and where a high level of amenity is expected.
- Locations with an international or national designation and the designated features which may be affected by dust.
- Locations where there is a community of a particularly sensitive dust species such as vascular plants. Examples include Special Area of Conservation (SACs) designated for heathlands or local sites designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.

Medium Sensitivity Receptors

- Commercial properties, parks, and places of work, and where humans are transient.
- Locations where there is particularly important plant species, where its dust sensitivity is unknown
- Nationally designated sites where the features may be affected by dust deposition. Example: site of Special Scientific Interest (SSSI) with dust sensitive features.

Low Sensitivity Receptors

- Locations where the enjoyment of amenity or property is not reasonably expected, such as playing fields and farmland.
- Locally designated sites or features may be affected by dust. Example: local nature reserve with dust sensitive features.

Sensitivities of receptors to ecological effects are set out in detail in Section 9.3.3.1.2.

The IAQM (2024)[11] guidance has outlined three types of effects to be considered:

- Sensitivities of People to Dust Soiling Effects
- Sensitivities of People to the Health Effects of PM_{10}
- Sensitivities of Receptors to Ecological Effects

For the purposes of this assessment, high sensitivity receptors are residential properties. Commercial properties and places of work are regarded as medium sensitivity while low sensitivity receptors are farmlands, and places where people are present for short periods or do not expect a high level of amenity.

Sensitivity of People to Dust Soiling Effects

Dust soiling effects can occur for a distance of 250m from works areas, but the majority of deposition occurs within the first 50m (IAQM, 2024). Table 9-6 below identifies the sensitivity of an area to dust soiling effects on people and their properties, relative to different receptor sensitivities.

Table 9-6 Sensitivity of the Area to Dust Soiling Effects on People and Property. (Source: IAQM. 2024.Guidance on the Assessment of Dust from Demolition and Construction, page 21)

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Sensitivities of People to the Health Effects of PM_{10}

When assessing sensitivity of people to the health effects of PM_{10}, the IAQM (2024) guidance recommends the use of sensitivities bands based on whether or not the receptor is likely to be exposed to elevated concentrations of PM_{10} over a 24-hour period. Table 9-7 below identifies the sensitivity of an area to human health effects of PM_{10}, relative to different receptor sensitivities.

Table 9-7 Sensitivity of the Area to Human Health Impacts. (Source: IAQM. 2024.Guidance on the Assessment of Dust from Demolition and Construction, page 22).

Receptor Sensitivity	Annual Mean PM_{10} concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
High	>32 µg/m^3	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m^3	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m^3	>10	Medium	Low	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
		1-10	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m^3	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	–	≥1	Low	Low	Low	Low

9.3.3.1.2 *Sensitivities of Receptors to Ecological Effects*

Dust deposition due to earthworks, construction, and trackout has the potential to physically and chemically affect sensitive habitats and plant communities. Table 9-8 below identifies the sensitivity of an area to ecological impacts.

Table 9-8 Sensitivity of the Area to Ecological Impacts. (Source: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, page 23)

Receptor Sensitivity	Distance from source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

There are no high ecological sensitive receptors, as described by the IAQM (2024) guidance within 50m of the Proposed Development footprint. Therefore, dust impacts on ecological receptors have been scoped out from this assessment.

9.3.3.2 Defining the Risk of Impacts

The dust emission magnitude is combined with the sensitivity of the area to determine the risk of impacts with no mitigation applied. The matrix in Table 9-9 provides a method of assigning the level of risk for each activity.

Table 9-9 Risk of Dust Impacts for Earthworks, Construction, Trackout. (Adapted from: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, page 24)

Sensitivity of Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

The risk of dust impacts for the Demolition, Earthworks, Construction and Trackout activities from the Proposed Development is summarised in Section 9.3.3 above.

EPA classification terminology as presented in Table 1-1 of Chapter 1 Introduction of this EIAR have been correlated with the equivalent risk rating from Table 9-10 below.

Table 9-10 Correlation of Impact Classification Terminology to Risk Rating

EPA Term	EPA Description	Risk Rating
Imperceptible	An effect capable of measurement but without significant consequences.	Negligible
Slight	An effect which causes noticeable changes in the character of the environment without affecting its sensitivities.	Low
Moderate	An effect that alters the character of the environment in a manner consistent with existing and emerging baseline trends.	Medium
Significant	An effect, which by its character, magnitude, duration or intensity alters a sensitive aspect of the environment.	High

The risk of dust impacts for the Earthworks, Construction and Trackout activities from the Proposed Development is summarised in Section 9.4.2 below.

9.3.4 Baseline Air Quality

The EPA publishes Air Monitoring Station Reports for monitoring locations in all four Air Quality Zones. The most recent ambient air quality monitoring data for air quality is available in the Air Quality in Ireland 2024 report, published by the EPA in September 2025. The figures from the summary tables appendix of this report relate to air quality data from Ennis (46km to the south of the site), Portlaoise (123km to the south-east), Dundalk (195km to the north-east) and Letterkenny (260km northeast). Monitoring Stations have been used to inform the tables below. These monitoring locations lie within Zone C respectively. Similar measurement values for all air quality parameters at the Zone C sites would be expected for the Proposed Development site.

9.3.4.1 Sulphur Dioxide (SO_2)

Sulphur dioxide data for Ennis, Portlaoise, Dundalk and Letterkenny in 2024 is presented in Table 9-11.

Table 9-11 Average Sulphur Dioxide Data for Ennis, Portlaoise, and Dundalk and Letterkenny in 2024

Parameter	Measurement
Average Annual Mean	6.5 µg/m^3
Hourly values > 350	3 (Letterkenny station only)
Average Hourly max	173.2 µg/m^3
Daily values > 125	0
Average Daily max	39.6 µg/m^3

During the monitoring period, there was three exceedances of the hourly limit value of 350 µg/m^3 for the protection of human health, all of which occurred in Letterkenny. However, no exceedances of the daily limit value were recorded. As shown in table 9-11 the average maximum hourly value recorded during the assessment period was 173.2 µg/m^3. In addition, there were no exceedances of the annual mean limit for the protection of ecosystems. It is expected based on professional judgement that SO_2 values at the Proposed Development site would be similar to those recorded for the Zone C sites above.

9.3.4.2 Particulate Matter (PM_{10})

Sources of particulate matter include vehicle exhaust emissions, soil and road surfaces, construction works and industrial emissions. The EPA report[1] provide annual mean PM_{10} concentration for twenty-four Zone C locations. For the purposes of this assessment, average data figures from Galway Rahoon, Galway Eyre Square and Galway Briarhill from 2024 only are outlined in Table 9-12 below.

Table 9-12 Average Particulate Matter (PM_{10}) Data for Galway Rahoon , Galway Eyre Square and Galway Briarhill (Zone C) in 2024

Parameter	Measurement
Average Annual Mean	12.4 µg/m^3
Average % Data	89.3%
Days > 50 ug/m^3	1
Average Daily Max	45.9 µg/m^3

Notes: [1-] PM_{10} daily limit for the protection of human health: No more than 35 days >50 µg/m^3

The daily limit of 50 µg/m^3 for the protection of human health was exceeded on 1 day, which is below the PM_{10} daily limit for the protection of human health of a max 35 days >50 µg/m^3 applicable from 2005. .It is expected based on professional judgement that PM_{10} values at the Proposed Development site is similar to those recorded for the Zone C sites above.

9.3.4.3 Nitrogen Dioxide (NO_2)

The EPA report[1] provides annual Nitrogen dioxide (NO_2) data for eleven Zone C locations. For the purposes of this assessment, average data figures from Galway Eyre Square and Galway Briarhill from 2024 is presented in Table 9-13 below.

Table 9-13 Average Nitrogen Dioxide Data for Galway Eyre Square and Galway Briarhill Zone C Sites in 2024

Parameter	Measurement
Average Annual Mean	14.9 µg/m^3
NO_2 Values >200	0
Values > 140 (UAT)	0
Values >100 (LAT)	1
Average Hourly Max.	88.3 µg/m^3

The annual mean NO_2 value was below the annual mean limit value for the protection of human health of 40 µg/m^3. The lower assessment threshold of 100 µg/m^3 was exceeded a total of 1 no. times during the monitoring periods at Galway Briarhill.

In 2024, the average hourly max. NO_2 value of 88.3 µg/m^3 measured during the monitoring period was below the hourly max threshold of 200 µg/m^3. It would be expected that NO_2 values at the Proposed Development site would be similar to those recorded for the Zone C sites above.

9.3.4.4 Carbon Monoxide (CO)

The EPA Report[1] provides rolling 8-hour carbon monoxide concentrations for Portlaoise and Dundalk which are Zone C sites. Carbon Monoxide data for 2024 is presented in Table 9-14 below.

Table 9-14 Carbon Monoxide Data for Portlaoise and Dundalk – Zone C Site in 2024

Parameter	Measurement
Average Annual Mean	0.2 mg/m^3
Median	0.2 mg/m^3
Average % Data Capture	96.6%
Values > 10	0
Average Max	1.2 mg/m^3

The average concentration of carbon monoxide was 0.2 mg/m^3. The carbon monoxide limit value for the protection of human health is 10,000 µg/m^3 (or 10 mg/m^3). On no occasions were values in excess of the 10 mg limit value set out in Directive 2008/69/EC. It is expected based on professional judgement that CO values at the Proposed Development site would be similar to those recorded for the Zone C site above.

9.3.4.5 Ozone (O_3)

The EPA report[1] provide rolling 8-hour ozone concentrations for six Zone C sites, Kilkenny, Limerick Henry Street, Limerick Peoples Park, Waterford, Waterford Port and Bray. Ozone (O_3) data for 2024 is presented in Table 9-15 below. As can be observed from Table 9-15 there were no exceedances of the maximum daily eight-hour mean limit of 120 µg/m^3. It is expected based on professional judgement that O_3 values at the Proposed Development site would be similar or lower than those recorded for the Zone C sites below.

Table 9-15 Average Ozone Data for Zone C Sites in 2024

Parameter	Measurement
Annual Mean	52.6 µg/m^3
Median	54.4 µg/m^3
% Data Capture	92.7%
No. of days > 120	0 days

9.3.4.6 Dust

There are no statutory limits for dust deposition in Ireland. However, EPA recommends a maximum daily deposition level of 350 mg/m^2/day when measured according to the TA Luft Standard 2002. This limit value can also be implemented with regard to dust impacts from construction activities associated with the Proposed Development.

The extent of dust generation at any site depends on the type of activity undertaken, the location, the nature of the dust, i.e., soil, sand, etc., and the weather. In addition, dust dispersion is influenced by external factors such as wind speed and direction and/or, periods of dry weather. Construction dust has the potential to be generated from on-site activities such as excavation and backfilling. Construction traffic movements also have the potential to generate dust as they travel along the haul route.

9.4 Likely and Significant Effects and Associated Mitigation Measures

9.4.1 "Do-Nothing" Scenario

If the Proposed Development is not permitted, the site would remain largely unaltered as a result of the Do-Nothing Scenario. The potential for additional investment and employment in the area in relation to the Proposed Development would be lost.

9.4.2 Construction Phase

9.4.2.1 General Air Quality

The Proposed Development will involve (as outlined in Chapter 4 of this EIAR) the construction of 362 residential units and all associated works in Knocknacarra, Co. Galway.

The construction phase of the Proposed Development will require the operation of construction vehicles and plant on site. Exhaust emissions associated with vehicles and plant such as NO_2, Benzene, and PM_{10} will arise as a result of construction activities.

This potential effect will not be significant and will be restricted to the duration of the construction phase and localised to works areas. Therefore, this is considered a short-term, slight, negative effect.

Mitigation measures to reduce this effect are presented below.

Mitigations for the Proposed Development

- All vehicles to switch off engines when not in use;

- No idling vehicles;
- On-road vehicles to comply to set emission standards;
- All non-road mobile machinery (NRMM) to be fitted with appropriate exhaust system and to be regularly serviced;
- Haul routes to be hard surfaced and cleaned and appropriate speed limits applied around the site;
- The methods of working will comply with all relevant legislation and best practice guidelines in reducing the environmental effects of the works.

Residual Effect

Following implementation of the mitigation measures above, residual effects of emissions arising from the construction phase of the Proposed Development will be a short term, imperceptible, negative effect on Air Quality.

Significance of Effects

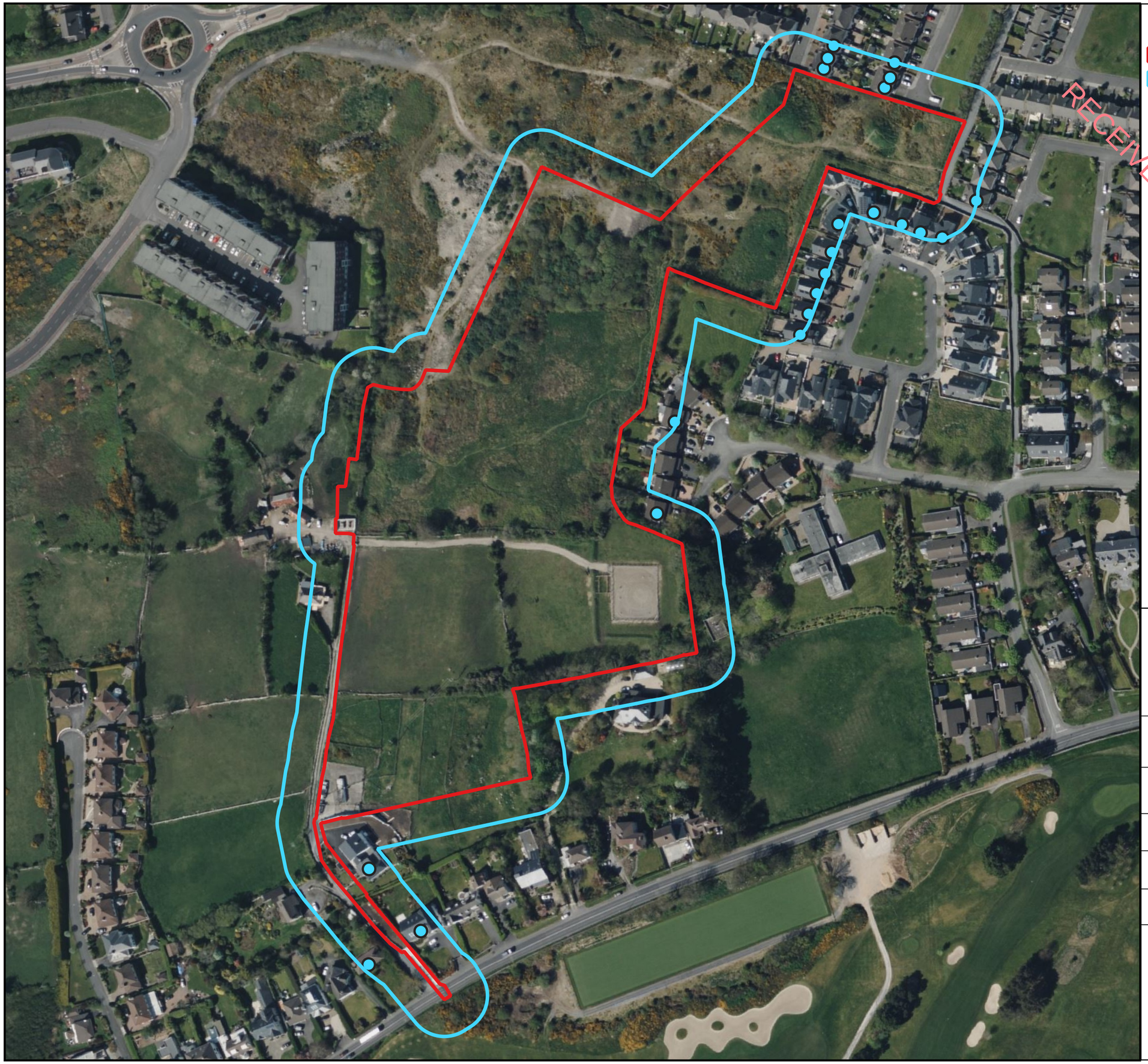
Based on the evaluation above there will be no significant effects.

9.4.2.1.2 *Dust Emissions*

Considering that the works have potential to generate dust—such as excavations, construction of paths/roads, and the transportation of construction and waste materials—are proposed to take place, the Proposed Development site boundary was adopted as the reference point for constraints mapping to assess the proximity of receptors to potential dust deposition.

The IAQM (2024) methodology for the Assessment of Dust from Demolition and Construction as discussed in Section 9.3 above is used to assess the potential risk to sensitive receptors from dust deposition. Dust deposition impacts can occur for a distance of 250m from works areas, but the majority of deposition occurs within the first 50m (IAQM, 2024).

Figures 9-2, 9-3, 9-4 and 9-5 below show sensitive (residential) receptors within 20m, 50m, 100m and 250m of the Proposed Development site boundary. These distances are defined in Section 9.3.3 above and are in line with the IAQM (2024) methodology.



Map Legend

- Planning Application (Red Line) Boundary
- IAQM 20m Buffer
- Residential Receptors within 20m of Proposed Development

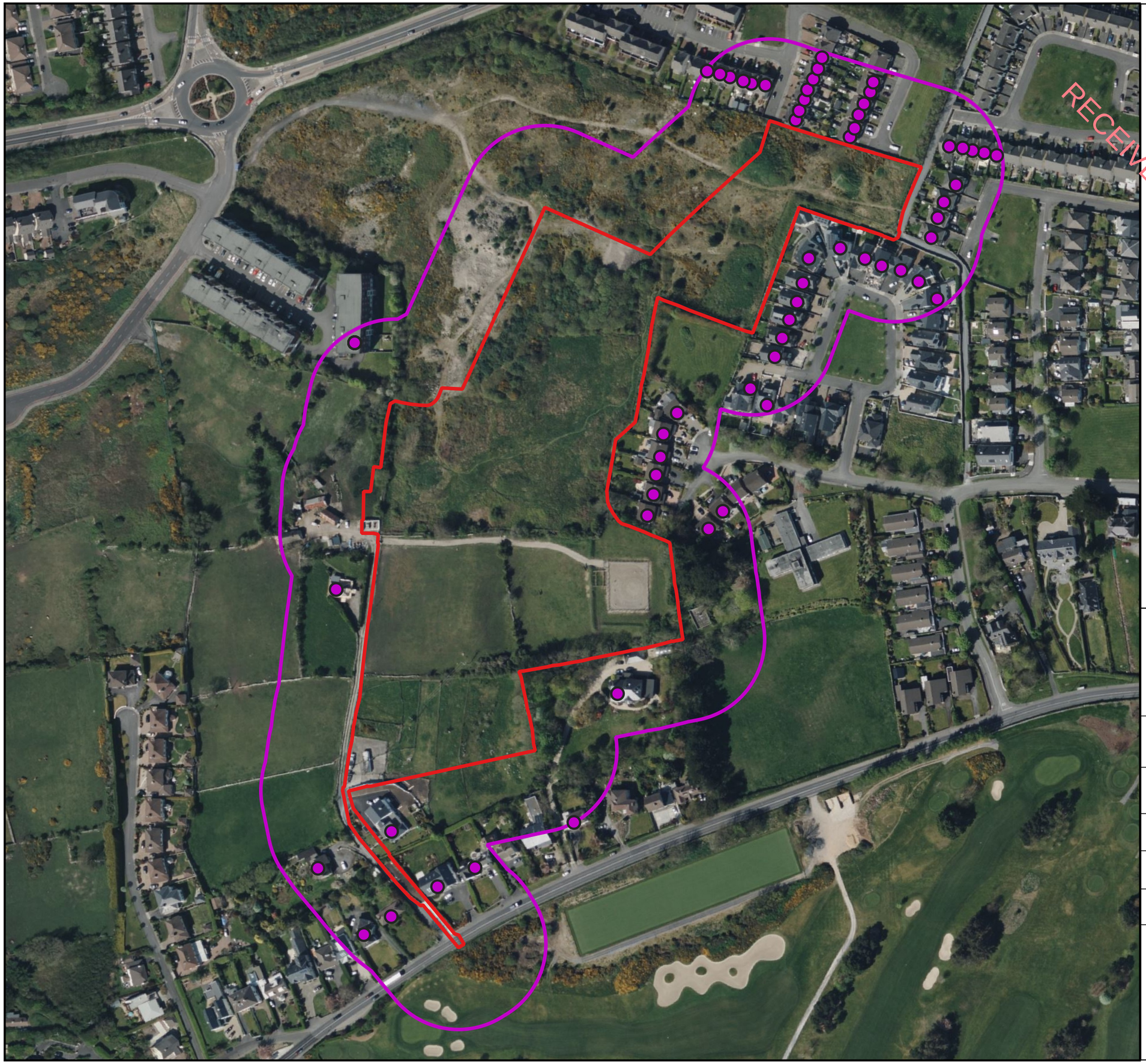
RECEIVED: 16/10/2025

Drawing Title
Receptors (IAQM) within 20m of the Proposed Development

Project Title
Proposed Large-Scale Residential Development at Knocknacarra, Galway.

Drawn By	Checked By
EC	TM
Project No. 240142	Drawing No. Figure 9-2
Scale 1:2,000	Date 2025-10-10

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie



Map Legend

- Planning Application (Red Line) Boundary
- IAQM 50m Buffer
- Residential Receptors within 50m of Proposed Development

Drawing Title
Receptors (IAQM) within 50m of the Proposed Development

Project Title
Proposed Large-Scale Residential Development at Knocknacarra, Galway.

Drawn By	Checked By
EC	TM
Project No. 240142	Drawing No. Figure 9-3
Scale 1:2,250	Date 2025-10-10

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

Map Legend

- Planning Application (Red Line) Boundary
- IAQM 100m Buffer
- Residential Receptors within 100m of Proposed Development

Drawing Title
Receptors (IAQM) within 100m of the Proposed Development

Project Title
Proposed Large-Scale Residential Development at Knocknacarra, Galway.

Drawn By	Checked By
EC	TM
Project No. 240142	Drawing No. Figure 9-4
Scale 1:2,500	Date 2025-10-10

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

Map Legend

- Planning Application (Red Line) Boundary
- IAQM 250m Buffer
- Residential Receptors within 250m of Proposed Development

Drawing Title
Receptors (IAQM) within 250m of the Proposed Development

Project Title
Proposed Large-Scale Residential Development at Knocknacarra, Galway.

Drawn By	Checked By
EC	TM
Project No. 240142	Drawing No. Figure 9-5
Scale 1:3,600	Date 2025-10-10

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email:info@mkoireland.ie
Website: ww.mkoireland.ie

Table 9-16 below outlines the number of receptors (residential) within 20m, 50m, 100m and 250m respectively.

Table 9-16 Number of Receptors (Residential) with 20m, 50m, 100m, and 250m of the Proposed Development Site Boundary

Number Of Receptors	Distance from source (m)			
	<20	20-50	50 - 100	100 - 250
Number of Receptors	22	52	126	268

In addition to these residential receptors, a number of other sensitive receptors are located in the surrounding area:

- An ecclesiastical premises at The Orchard residential estate is located approximately 60m from the site boundary.
- Knocknacarra National School is located approximately 230m west of the site.
- An ecclesiastical premises adjoining the national school.
- A childcare facility at the Altán apartment complex, is located approximately 20m from the boundary.
- A Gaelsoil is located approximately 330m north of the site.
- A secondary school is located approximately 450m southeast of the site, with a second school located 100m further south.

Table 9-17 below identifies the sensitivity of the area to dust soiling effects on people and property surrounding the Proposed Development site, as described in Section 9.4. Only the highest level of area sensitivity from the table needs to be considered (IAQM, 2024). Therefore, due to the residential nature of the surrounding area, the overall sensitivity of the area to dust soiling effects is considered to be High.

Table 9-17 Sensitivity Assessment of the Area to Dust Soiling Effects on People and Property from Proposed Development construction works. (Adapted from: IAQM. 2024. Guidance on the Assessment of Dust from Demolition and Construction, page 21)

Receptor Sensitivity	Number Of Receptors	Distance from source (m)			
		<20	20 - 50	50 - 100	100 - 250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

Table 9-18 Sensitivity Assessment of the Area to Human Health Impacts from Proposed Development construction works. (Adapted from: IAQM. 2024.Guidance on the Assessment of Dust from Demolition and Construction, page 22)

Receptor Sensitivity	Annual Mean PM_{10} Concentration	Number Of Receptors	Distance from source (m)			
			<20	<50	<100	<250
High	<24 µg/m^3	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	≥1	Low	Low	Low	Low

Table 9-18 above identifies the sensitivity of people in the area surrounding the development footprint of the Proposed Development site to the health effects of PM_{10}, as described in Section 9.3. The overall sensitivity of the area to human health effects of PM_{10} is considered to be Low.

Note that the subsection of the table is used because the expected PM_{10} annual mean concentration for the site is anticipated to be similar to that recorded for Zone C, as shown above.

As identified in Section 9.3 above, the Proposed Development is classified as 'Small' for Demolition, 'Medium' for Earthworks and trackout activities and 'Large' for Construction. Therefore, when combined with the sensitivity of the area, using Table 9-9 above as guidance, the pre-mitigation risk of impacts from the Proposed Development is summarised in Table 9-19 below.

Table 9-19 Summary of Dust Risk for the Proposed Development Activities. (Adapted from: IAQM. 2024.Guidance on the Assessment of Dust from Demolition and Construction, page 24)

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low Risk	Medium Risk	Medium Risk	Medium Risk
Human Health	Low Risk	Low Risk	Low Risk	Low Risk
Ecological	Low Risk	Low Risk	Low Risk	Low Risk

The overall risk of dust emissions impacts with no mitigation applied for the major dust generating activities during the construction phase is Medium. Therefore, the potential effects of dust from the construction phase of the Proposed Development are considered to be equivalent to short-term, moderate negative effects.

Mitigation Measures

Mitigation and monitoring measures are proposed and outlined in the Construction Environmental Management Plan (CEMP) which is included as Appendix 4-1 of this EIAR. These are as follows:

- Site roads with the potential to give rise to dust will be regularly watered, as required, during dry and/or windy conditions;
- The designated public roads outside the site and along the main transport routes to the site will be regularly inspected by Site Management for cleanliness, and cleaned as necessary;
- Material handling systems and material storage areas will be designed and laid out to minimise exposure to wind;
- Stockpiles of soils and aggregate materials will be covered with tarpaulin or plastic sheeting, if required;
- Water misting or bowsers will operate on-site as required to mitigate dust in dry weather conditions;
- The transport of soils or other material, which has significant potential to generate dust, will be undertaken in tarpaulin-covered vehicles where necessary;

- All vehicles leaving the construction areas of the site will rinse their wheels at a designated wheel wash area prior to entering the local road network;
- All construction related traffic will have speed restrictions on un-surfaced roads to 15 kph;
- Daily inspection of construction sites to examine dust measures and their effectiveness;
- When necessary, sections of the approach road will be swept using a truck mounted vacuum sweeper.

It is also proposed to carry out dust monitoring at the site during the construction phase. Monitoring will be carried out quarterly using the Bergerhoff method. This monitoring will ensure that the mitigation measures outlined above are functional and being implemented. A map of the proposed monitoring locations is shown in the CEMP in Appendix 4-2.

A complaints log will be maintained by the construction site manager and in the event of a complaint relating to dust nuisance, an investigation shall be initiated. A sample Complaints Form is included in the CEMP.

Residual Effect

With the implementation of the above mitigation measures, the residual effect on air quality is considered to be a short-term, imperceptible, negative effect brought about by dust emissions generated during the construction activities.

Significance of Effects

Based on the evaluation above there will be no significant effects.

9.4.2.2 Operational Phase

9.4.2.3 Exhaust Emissions

Exhaust emissions associated with the operational phase of the Proposed Development will arise primarily from vehicle movements of maintenance workers. This will give rise to a long-term, slight, negative effect.

Mitigations for the Proposed Development

- Any vehicles or plant brought onsite during the operational phase will be maintained in good operational order that comply with the Road Traffic Acts 1961 as amended, thereby minimising any emissions that arise.
- When stationary, delivery and on-site vehicles will be required to turn off engines.

Residual Effect

The residual effect from the operational phase and the implementation of the above mitigation measures will result in a Long-term, Imperceptible, Neutral effect.

Significance of Effects

Based on the assessment above there will be no significant effects.

9.4.2.4 Dust Emissions

It is anticipated that there will be no dust emissions associated with the operational phase of the Proposed Development.

9.4.3 Human Health

Whilst the construction phase of the Proposed Development will give rise to minor increases in vehicle emissions, the implementation of the mitigation measures discussed above, and good management practices can prevent or minimise potential effects off-site. Good management practice consists of good site design and layout, adopting appropriate working methods and choosing the right equipment. The potential for health effects is considered negligible as the potential for exhaust emissions will be limited and controlled through site layout design and mitigation measures.

Whilst the operational phase of the Proposed Development will give rise to minor increases in vehicle emissions, the implementation of mitigation measures listed above can prevent or minimise the potential effects.

There will be no significant effects on human health as a result of the construction or operation of the Proposed Development as it relates to Air Quality.

9.4.4 Cumulative Effects

Potential cumulative effects on air quality between the Proposed Development and other permitted or proposed projects in the area, were also considered as part of this assessment. Developments within 1km of the site boundary were considered as part of the cumulative effect assessment.

The potential for the Proposed Development to result in significant cumulative or in combination effects when assessed with the Proposed Project, was considered. The Proposed Project involves the construction of more than 500 residential units, and will require separate, individual planning applications for each part of the project. The individual planning applications will be subject to separate planning applications and Environmental Impact Assessment Reports. Each EIAR will include a cumulative assessment, which combines the individual project's impacts with those from other past, present, and future projects to understand the cumulative effect of the Proposed Project.

Given that the construction works required for Proposed Development will potentially take place concurrently with the works being undertaken for the permitted swimming pool site, there is potential for a cumulative negative effect on air quality. However, a review of the mitigation measures proposed to be implemented at the site of the permitted swimming pool development indicated that there will be no significant effects on air quality. Therefore, no cumulative effects are foreseen in relation to the Proposed Development when considered in combination with the permitted swimming pool development.

The potential for cumulative effects between the construction phase of the Proposed Development other existing and proposed projects within 1km of the EIAR site boundary was also considered. There will be exhaust emissions from construction plant and machinery and potential dust emissions associated with all construction activities. Should these developments be constructed simultaneously, there is the potential for a short-term slight negative cumulative effect on air quality due to vehicular and dust emissions. A list of these proposed and permitted developments are outlined in Table 2-2 and Appendix 2-1 in Chapter 2 of this EIAR.

The nature of the Proposed Development is such that, once operational, it will have a Long-term, Imperceptible, Negative effect on the air quality. Emissions of carbon dioxide (CO_2), oxides of nitrogen (NOx), sulphur dioxide (SO_2) during the operational phases of the Proposed Development and other

developments, will be minimal, primarily relating to vehicles, and therefore there will be a Long-term, Imperceptible, Negative cumulative effect on air quality.

Given the nature of scale of the Proposed Development and the limited number and size of other developments in the vicinity, there will be no significant cumulative effects on Air Quality.

9.5 Conclusion

This Chapter of the EIAR followed relevant guidance and best practice to provide an assessment of potential effects from the Proposed Development on air quality, either alone or cumulatively considered with other relevant activities in the vicinity of the site. It is concluded that there will be no significant effects on Air Quality from the Proposed Development.