SDCC Rathcoole Housing Development

Environmental Impact Assessment Report (EIAR)
Chapter 09: Air Quality

South Dublin County Council (SDCC)

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9 Air Quality

9.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) assesses the likely significant effects of the SDCC Rathcoole Housing Development (thereafter referred to as the 'Proposed Development') on air quality. The potential effects during both the construction and operational phases of the Proposed Development have been considered.

The assessment has been undertaken in accordance with the overarching methodology set out in the EPA (2022) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports. Topic-specific assessment methodologies have been applied in accordance with relevant air quality guidance, principally the Institute of Air Quality Management (IAQM) guidance for the assessment of construction dust and operational air quality effects, together with relevant Transport Infrastructure Ireland (TII) guidance for road traffic emissions.

During construction, earthworks, construction activities and vehicle movements have the potential to generate dust and particulate matter emissions that may affect nearby sensitive receptors.

During operation, the principal potential air quality effects are associated with changes in road traffic emissions. The assessment considers potential effects on nitrogen dioxide (NO_2) and Particulate Matter (PM_{10} and $PM_{2.5}$[1]) concentrations, together with the need for mitigation and the potential for residual and cumulative effects.

The assessment should be read in conjunction with Chapter 02: Description of Development and Chapter 14: Material Assets (Traffic), where relevant information relating to the Proposed Development, construction activities and associated traffic movements is provided.

9.2 Legislation, Policy and Guidance

This section sets out the legislation, policy and guidance sources which have informed the scope and methodology for the assessment of potential air quality effects (Table 9-1).

Table 9-1: Legislation and Policy Requirements Relevant to Air Qquality

Legislation/Policy	Constraints/Requirements of the SDCC Rathcoole Housing Development
EU Level	
European Union (EU) Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe (CAFE) (European Parliament and Council, 2015)	This EU directive is implemented by The Air Quality Standard Regulations 2022 and is discussed below.
Directive 2024/2881 on Ambient Air Quality and Cleaner Air for Europe (European Parliament and Council, 2024)	In October 2024, the EU revised the Ambient Air Quality and Cleaner Air for Europe Directive to include more stringent Air Quality Limit Values (AQLV) for countries to achieve by 2030. EU member states have two years to transpose these Limit Values (LV) into their national laws. The LVs for these pollutants are presented in Table 9-22. These new AQLV are not yet transposed into Irish Air Quality Standards.
National Level	
Air Quality Standards Regulations 2022 S.I. No. 739 of 2022 (Government of Ireland, 2022)	The Air Quality Standard Regulations 2022 implement the European Union Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe (CAFE) and designate the Environmental Protection Agency (EPA) as the competent authority responsible for assessing ambient air quality in the territory of the State. They also establish legally binding LV and alert thresholds for concentrations of certain pollutants in ambient air, to prevent or reduce harmful effects on human health and the environment. Limit values (LV) were

[1] PM_{10} & $PM_{2.5}$ - Particulate Matter with an aerodynamic diameter less than 10 micrometres (µm) and less than 2.5µm, respectively

Legislation/Policy	Constraints/Requirements of the SDCC Rathcoole Housing Development
	published for seven pollutants, with alert thresholds for an additional five pollutants. National assessments have demonstrated that there is no risk of carbon monoxide (CO), 1,3-butadiene, benzene, lead and sulphur dioxide (SO_2) concentrations exceeding the limits due to emissions from traffic anywhere in Ireland. The remaining pollutants are nitrogen dioxide (NO_2) and particulate matter in the fractions of equal to or less than 10µm (PM_{10}) and equal to or less than 2.5µm ($PM_{2.5}$).
Air Pollution Act 1987 (as amended) (Number 6 of 1987) (Government of Ireland, 1987)	The Air Pollution Act 1987 (as amended) provides local authorities with the primary responsibility for monitoring air quality, including the nature, extent and effects of emissions within their administrative area. Local authorities are also given powers under the Act to take measures to prevent or limit air pollution in their administrative area. For this Proposed Development, the responsible local authority is South Dublin County Council.
National Planning Framework – First Revision (Department of Housing, Planning, and Local Government, 2020).	The National Planning Framework – First Revision is the Government's long-term overarching strategy for future development and infrastructure in Ireland up to 2040. The Framework includes the following overarching aim that is relevant to this assessment: "Creating a Clean Environment for a Healthy Society: Promoting Cleaner Air: Addressing air quality problems in urban and rural areas through better planning and design." The Framework includes National Policy Objective 93, which stresses the importance of improving ambient air quality: *"National Policy Objective 64: Improve air quality and help prevent people being exposed to unacceptable levels of pollution in our urban and rural areas through integrated land use and spatial planning that supports public transport, walking and cycling as more favourable modes of transport to the private car, the promotion of energy efficient buildings and homes, heating systems with zero local emissions, green infrastructure planning and innovative design solutions."*
Clean Air Strategy for Ireland (Government of Ireland, 2023)	The Government of Ireland published the Clean Air Quality Strategy for Ireland in April 2023. The Strategy aims to provide the high-level strategic policy framework necessary to identify and promote the integrated measures across Government policy that are required to reduce air pollution and promote cleaner ambient air, while also delivering on wider national objectives.
Regional and Local Level	
South Dublin County Development Plan 2022 – 2028 (South Dublin County Council, 2022)	The South Dublin County Development Plan 2022 – 2028 sets out the land use framework to guide future development within the County. Policy IE8 Environmental Quality includes one objective specific to air quality: *"IE8 Objective 3 - To implement the recommendations of the Dublin Region Air Quality Plan 2021 to protect people from the harmful health effects associated with air pollution, to preserve good air quality where it exists and to improve air quality where it is unsatisfactory."*
Dublin Region Air Quality Plan 2021 (Dublin City Council *et al.*, 2021)	The Dublin Region Air Quality Plan is referred to in the Development Plan. The plan acknowledges that NO_2 is the pollutant of most concern in the Dublin region. It lists several measures which are required to reduce NO_2 concentrations within the Dublin region. Measures include: • Enhanced Air Quality Monitoring and Modelling – additional monitoring sites to be added; • Public Parking Controls – local authorities to incorporate air quality into their development plans with regards to public parking; • Publication of National Air Quality Strategy; and • Introduction of Clean Air Zones (CAZs) and Low Emission Zones (LEZs) – appraisals and possible feasibility studies to be carried out regarding the introduction of CAZs/LEZs across the Dublin region.
Technical Guidance	

Legislation/Policy	Constraints/Requirements of the SDCC Rathcoole Housing Development
Guidance on the Assessment of Dust from Demolition and Construction v2.2 (IAQM, 2024)	'Guidance on the assessment of dust from demolition and construction' published by the IAQM is followed for the assessment of dust impacts and particulate emissions and the selection of appropriate good practice control measures. The guidance provides an approach to the screening to determine the need for a detailed assessment, and a methodology for carrying out a qualitative assessment of the risk of dust impacts occurring as well as provides a list of best-practice mitigations measures suited to the assessed risk.
Guidance on Land-use Planning and Development Control: Planning for Air Quality (IAQM, 2017)	This guidance, published by the IAQM, sets out principles of scoping and conducting air quality assessments, and how the significance of the effects arising from air quality impacts may be determined, using an impact matrix. This approach has been followed to assess air quality effects from the operational phase of the Proposed Development.
Guidelines on the information to be contained in Environmental Impact Assessment Reports (EIAR) (Environment Protection Agency, 2022)	The Guidelines are primarily intended to be an authoritative reference to those preparing EIARs for projects covered by the EIA Directive.

The 2023 EU AQLVs relevant to this assessment are provided in Table 9-2.

Table 9-2: Air Quality Limit Values under Directive (EU) 2024/2881

Pollutant	Averaging Period	Concentration (µg/m^3)	Permitted Exceedances
NO_2	Annual mean	20	None
	24 hour	50	Not to be exceeded more than 18 times a year
	1-hour mean	200	Not to be exceeded more than 3 times a year
PM_{10}	Annual mean	20	None
	24-hour mean	45	Not to be exceeded more than 18 times a year
$PM_{2.5}$	Annual mean	10	None
	24 hour	25	Not to be exceeded more than 18 times a year

9.3 Methodology

A desktop study has been undertaken to determine the potential air quality effects during both the Proposed Development construction and operational phases. Taking into consideration the type of the Proposed Development and the potential air quality effects, a proportionate assessment has been undertaken for the EIAR and consists of the following tasks:

- Review baseline air quality conditions within the study area in relation to NO_2, PM_{10} and $PM_{2.5}$ concentrations from available information;
- Identify sensitive human health receptors and designated habitats in the study area;
- Undertake a qualitative assessment of construction phase dust and particulate emissions, in line with the IAQM construction dust guidance (IAQM, 2024); and
- Undertake a quantitative assessment of operational phase road traffic emissions, in line with the IAQM planning guidance (IAQM, 2017). Annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations have been predicted at sensitive receptors in the opening year, with and without the Proposed Development, to determine potential air quality impacts.

9.3.1 Study Area

The IAQM construction dust guidance (IAQM, 2024) states that for human receptors, the study area for the construction dust assessment extends up to 250m from the boundary of the Site and/or 50m of the routes used by construction vehicles, and up to 250m from the Site entrance. For ecological receptors,

the study area extends to 50m from the boundary of the Site and/or 50m from the routes used by construction vehicles, and up to 250m from the Site entrance.

For the operational phase assessment, the study area extends up to 200m from all roads for which traffic data has been provided by the project transportation consultants.

9.3.2 Identifying Significant Environmental Effects

9.3.2.1 Construction Phase

Construction activities during the Proposed Development construction phase have the potential to generate dust and finer particulate (PM_{10} and $PM_{2.5}$) emissions that could impact sensitive receptors located close to the construction Site boundary and public roads used by construction traffic. A qualitative assessment has been undertaken to consider these impacts, in line with guidance published by the IAQM (2024). Any impacts would be temporary, i.e. during the period of the construction works only.

According to the IAQM guidance, the main air quality impacts that may arise during demolition and construction activities are:

- Dust deposition, resulting in the soiling of surfaces;
- Visible dust plumes, which are evidence of dust emissions;
- Elevated PM_{10} and $PM_{2.5}$ concentrations from demolition and construction activities; and
- An increase in concentrations of airborne particles and NO_2 due to exhaust emissions from vehicles and equipment used on the Site (non-road mobile machinery) and vehicles accessing the Site.

Activities on construction sites are classified into four types to reflect their different potential impacts:

- Demolition;
- Earthworks;
- Construction (erection of buildings and structures); and
- Track-out (the deposition of material onto the public road network by construction vehicles leaving site).

The following steps, as defined by the IAQM, have been followed as part of the construction dust assessment:

- Step 1: Screen the need for a more detailed assessment. Human and ecological receptors have been identified and the distance to the Proposed Development and construction route determined;
- Step 2: Assess the risk of dust impacts. This is done separately for each of the four construction activities and considers the scale and nature of the works to determine the potential dust emission magnitude, and the sensitivity of the area;
- Step 3: Determine the site-specific mitigation for each of the four potential activities. Based on the risk of impacts occurring, site-specific mitigation measures have been determined; and
- Step 4: Examine the residual effects and determine whether or not these are significant for each activity.

For amenity effects from coarser dust (>PM_{10}), the aim of the IAQM guidance method is to bring forward a scheme, including mitigation measures where necessary, that would control impacts so that they give rise to negligible or minor effects (at worst) at the closest sensitive receptors. Measures that reduce dust emissions would also reduce emissions of finer particles (PM_{10}). Determination of whether an effect is likely to be significant or not is based on professional judgement (based on experience of similar projects), taking account of whether effects are permanent or temporary, direct or indirect, constant or intermittent and whether any secondary effects are caused (in this instance, ‘secondary effects’ refers

to dust that is generated and deposited (primary impact) and then re-suspended and deposited again by further activity).

9.3.2.2 Operational Phase

The IAQM guidance (IAQM, 2017) includes screening criteria based on the number of additional traffic movements generated by a proposed development to inform whether a quantitative air quality assessment of road traffic emissions is required. The screening criteria includes the following:

- Annual average daily traffic (AADT) flows of light duty vehicles (LDV) change by 500 or more; or
- AADT flow of heavy duty vehicle (HDV) (vehicles greater than 3.5 tonnes, including buses and coaches) flows change by 100 or more.

As described in the guidance, the criteria is *"intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. The criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement, bearing in mind that the objective is to identify situations where there is a possibility of a significant effect on local air quality."*

The change in traffic flow on the local road network associated with the Proposed Development does not meet the above criteria, with the largest change in flow of 454 LDVs vehicles per day predicted on Greenogue Drive and Mullaly's Lane (refer to Appendix 9-1). However, a cautious and proportionate approach has been adopted and a simple level of air quality assessment has been undertaken

The simple level assessment utilised the TII Road Emissions Model (REM) tool to predict annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$. The impacts and significance of effects have been defined with reference to the IAQM guidance. In the absence of air quality monitoring nearby, model verification as described in TII Guidance (TII, 2025) could not be undertaken. However, using professional judgement an adjustment factor of 2 has been applied to the model outputs, which is considered to be an appropriate factor for a study area in similar environments.

9.3.3 Determination of Sensitive Receptors

According to the IAQM construction dust guidance (IAQM, 2024), during the construction phase, a human receptor refers to any location where a person or property may experience the adverse effects of airborne dust or dust soiling or exposure to PM over a time period relevant to the air quality objectives. In terms of annoyance effects, this will most commonly relate to dwellings, but may also refer to other premises (refer to Table 9-3).

An ecological receptor refers to any sensitive habitat affected by dust soiling. This includes the direct impacts on vegetation or aquatic ecosystems of dust deposition, and the indirect impacts on fauna (e.g. on foraging habitats). Examples of ecological receptors include nature conservation designations such as Special Areas of Conservation (SACs), Special Protection Areas (SPA), Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs).

The IAQM construction dust guidance (IAQM, 2024) provides further detail regarding the sensitivity of receptors to dust soiling, health effects and ecological effects (Table 9-3).

Table 9-3: Examples of Dust Sensitive Receptors

Sensitivity	Dust Soiling	Human Health	Ecological
High	▪ Dwellings ▪ Museum and other culturally important collections ▪ Medium and long term car parks ▪ Car showrooms	▪ Residential properties. ▪ Hospitals ▪ Schools ▪ Residential care homes	▪ Locations with an international or national designation (e.g. SAC) and the designated features may be affected by dust soiling.
Medium	• Parks • Places of work	• Office and shop workers but will generally not include workers occupationally exposed to PM_{10}, as	• Locations with a national designation (e.g. NHAs) where the features may be

Sensitivity	Dust Soiling	Human Health	Ecological
		protection is covered by Health and Safety at Work legislation.	affected by dust deposition.
Low	• Playing fields • Farmland (unless commercially-sensitive horticultural) • Footpaths • Short term car parks • Roads	• Public footpaths • Playing fields • Parks • Shopping streets	• Locations with a local designation where the features may be affected by dust deposition local Nature Reserve with dust sensitive features.

During the operational phase, receptors sensitive to health effects of NO_2, PM_{10} and $PM_{2.5}$ are human health receptors such as residential properties, hospitals and schools. The AQLV values have been set at concentrations that provide protection to all members of society, including more vulnerable groups, such as the very young, elderly or unwell. As such the sensitivity of receptors was considered in the definition of the AQLV, and, therefore, no additional subdivision of human health receptors on the basis of building or location type is necessary.

There are a number of sensitive receptors in close proximity to the Proposed Development. Annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations were predicted at the following worse case receptors, i.e. those located closest to the roads, with the largest changes in traffic flow (Table 9-4).

Table 9-4: Modelled Air Quality Receptors

Receptor ID	Location
1	Main Street, between the N7 and Johnson Road
2	Stoney Lane
3	Greenogue Drive, near the junction with Stoney Road
4	Mullaly's Lane
5	Stoney Hill Road
6	Coolamber Road
7	Main Street, between Coolamber Road an R120 Bridge
8	R120 Fitzmaurice Road, east of Beechwood Lawns
9	Representative of the Proposed Development, adjacent to Mullaly's Lane

A review of the dataset provided by the National Parks and Wildlife Services (National Parks and Wildlife Service, 2026) confirms there are no designated habitats located within 50m of the Proposed Development (or anticipated construction routes, up to 250m from the site entrance), or within 200m of roads included in this assessment.

9.3.4 Describing Potential Effects

During the construction phase, the dust emission magnitude associated with the Proposed Development construction activities has been assessed with reference to the IAQM construction dust guidance (IAQM, 2024). The determination of the dust emission magnitude is based on the scale of the anticipated works. This should be defined for the different construction activities relevant to the Proposed Development (i.e. demolition, earthworks, construction and trackout) and is classified as small, medium or large.

During the operational phase, the IAQM guidance (IAQM, 2017) defines magnitude as the potential change in pollutant concentrations relative to the baseline concentrations attributable to road traffic emissions. The assessment also presents the total concentration of the assessed pollutants, in order to identify the risk of the AQLV being exceeded.

For consideration of a change in annual mean concentration of a given magnitude, the IAQM have published recommendations for describing the effects of such impacts at individual receptors as set out in Table 9-5.

Table 9-5: Effects Descriptors at Individual Receptors

Annual Mean Concentration at Receptor in Assessment Year	Change in Concentration Relative to Air Quality Limit Value (AQLV)				
	0%	1%	2% – 5%	6% – 10%	> 10%
≤75% of AQLV	Neutral	Neutral	Neutral	Slight	Moderate
76% - 94% of AQLV	Neutral	Neutral	Slight	Moderate	Moderate
95% - 102% of AQLV	Neutral	Slight	Moderate	Moderate	Substantial
103% - 109% of AQLV	Neutral	Moderate	Moderate	Substantial	Substantial
≥110% of AQLV	Neutral	Moderate	Substantial	Substantial	Substantial

9.3.5 Significance of Effect

The significance of effects associated with the construction phase of the Proposed Development corresponds to Step 4 (see Section 9.3.2) and takes into consideration the residual effects to determine whether or not these are significant for each activity.

The significance of effects associated with the operational phase of the Proposed Development applies the effects descriptors to individual receptors (Table 9-5). Where a single proposed development can be judged in isolation, it is likely that a 'moderate' or 'substantial' impact will give rise to a significant effect and a 'neutral' or 'minor' impact will not have a significant effect, but such judgements are always more likely to be valid at the two extremes of impact severity. An exceedance of the AQLV is likely to be considered significant.

Overall effect significance is determined using professional judgement and should consider:

- The number of people affected by increases and/or decreases in concentrations and a judgement on the overall balance;
- The number of people predicted to be exposed to levels above 2030 standards;
- Whether or not the exceedance of the 2030 standard is predicted to arise in the study area where none existed before, or the size of an exceedance area is predicted to be substantially increased;
- Whether or not the study area exceeds a 2030 standard and this exceedance is predicted to be removed, or the size of the exceedance area is predicted to be reduced;
- Uncertainty, including the extent to which worse-case assumptions have been made; and
- The extent to which the 2030 standard is predicted to be exceeded e.g. an annual mean NO_2 of 21 µg/m^3 should attract less weight in the determination of significance than an annual mean of 31µg/m^3.

9.3.6 Assumptions and Limitations

The following assumptions and limitations are associated with the air quality assessment:

- The TII REM has been used to determine annual mean pollutant concentration at sensitive receptors. The TII REM is considered a 'simple level' tool as the pollutant concentrations are based on the distance of the receptor to the nearest road (emission source) only. The tool does not take into consideration factors such as meteorological conditions and emissions from all roads which may contribute to pollutant concentrations at each receptor. However, use of the TII REM is considered to be a proportionate approach, taking into consideration the scale of the Proposed Development, existing air quality in the area relative to the EU 2030 AQLV and predicted changes in traffic flow associated with the Proposed Development.

- No air quality monitoring was undertaken within the study area and therefore model verification could not be undertaken. A verification factor of 2 was applied to the model outputs which, using professional judgement, is considered an appropriate factor for the study area, given the residential nature of the surrounding area, i.e. no motorways, no street canyons or bridges and no large industrial sources of emissions.
- The nearest background monitoring site to the Proposed Development is Tallaght in Dublin, located approximately 5.5km to the east. The 2024 background concentrations recorded at this site were projected to 2029 (assessed opening year of the Proposed Development) using the appropriate factor from the TII Guidance Air Quality Assessment of Specified Infrastructure Projects – Overarching Technical Document (TII, 2025).

9.4 Baseline Environment

9.4.1 Local Authority Monitoring Data

The Environmental Protection Agency (EPA) manages the national ambient air quality network in Ireland, which consists of 115 monitoring stations located across the country that monitor a range of pollutants. EU legislation on air quality (CAFÉ Directive (2008/50/EC) (European Parliament and Council, 2015) and Daughter Directives) requires that Member States divide their territory into zones for the purpose of monitoring, assessment and management of air quality. The EPA has designated the following four Air Quality Zones for Ireland:

- Zone A: Dublin City and environs;
- Zone B: Cork City and environs;
- Zone C: Other cities and large towns; and
- Zone D: Remainder of the country (rural Ireland).

The study area lies within Zone A; however, Rathcoole is located outside of Dublin city and on the outer fringes of Zone A. Monitoring data from Tallaght, approximately 5.5km east of the Proposed Development, have therefore been considered in establishing representative baseline conditions.. The most recent EPA Air Quality in Ireland Report available was published in 2025 (EPA, 2025) and is based on information gathered in 2024 and earlier. The report is supported by the Summary Data Tables 2024, which contain the 2024 monitoring data.

The findings of this report and summary data tables are described as follows:

- NO_2 was measured at 37 monitoring stations in Ireland in 2024, of which 15 were in Zone A. The highest annual mean NO_2 concentration in Zone A in 2024 was at Pearse Street, which is located within the city centre of Dublin. An annual mean NO_2 concentration of 38.2µg/m^3 was measured in 2024 which is above the 2030 AQLV of 20µg/m^3. However, at the monitoring site in Tallaght which is located closest to the Proposed Development (approximately 5.5km to the east), an annual mean NO_2 concentration of 12.1µg/m^3 was measured which is well below the annual mean AQLV (20µg/m^3) for annual mean NO_2 concentrations. Of the baseline data available, the air quality measured at Tallaght is considered most representative of existing air quality at the Proposed Development, given its proximity to the Site.
- PM_{10} was measured at 68 monitoring stations in 2024, of which 20 were in Zone A. There were no exceedances of the EU legislative limit value for annual mean PM_{10} in Zone A in 2024. The highest annual mean PM_{10} concentration monitored in Zone A was 16.8µg/m^3 at Davitt Road (with two exceedances of 50µg/m^3). At Tallaght, which his considered representative of the existing air quality at the Proposed Development, an annual mean PM_{10} concentration of 10.4µg/m^3 was measured.
- $PM_{2.5}$ was measured at 63 monitoring stations in 2024, of which 20 were in Zone A. There were no exceedances of the EU legislative limit value for annual mean $PM_{2.5}$ in Zone A in 2024. The highest annual mean $PM_{2.5}$ concentration monitored in Zone A was 8.1µg/m^3 at Amiens Street. At Tallaght, which is considered representative of the existing air quality at the Proposed Development, an annual mean $PM_{2.5}$ concentration of 6.2µg/m^3 was measured.

Overall, the available monitoring data indicate that baseline air quality in the vicinity of the Proposed Development is generally good, with concentrations at the representative Tallaght monitoring station below the applicable air quality limit values.

9.5 Potential Impacts

9.5.1 Construction

9.5.1.1 Step 1 - Screening

The construction phase programme is approximately two years, from June 2027 to May 2029, with on-site construction expected to begin in January 2028 and be completed in May 2029.

The Proposed Development is located at the outskirts of Rathcoole, and consequently there are receptors in close proximity of the Site that may be affected by the works. This includes high sensitivity receptors such as residential properties. Adjacent to the Proposed Development are multiple residential dwellings on Greenogue Drive, Mulally's Lane, Coolamber Road, Coolamber Drive and Beechwood Lawns, with additional receptors within the 250m assessment area.

The baseline annual mean PM_{10} concentration in 2024 was 10.4 µg/m^3 across the study area (based on monitoring at Tallaght). This is well below the revised EU 2030 PM_{10} annual average objective value of 20µg/m^3.

9.5.1.2 Step 2A – Definition of the Potential Dust Emission Magnitude

Demolition

No demolition is anticipated to occur prior to Proposed Development construction.

Earthworks

Across the Proposed Development, the total quantity of material to be exported off-site is estimated at 65,971 m³, of which 37,083 m³ relates to the residential portion of the site and the remaining 28,888 m³ to the non-residential area, including the pitch area. Therefore according to the IAQM construction dust guidance (IAQM, 2024), the potential dust emission magnitude for earthworks is categorised as **medium**.

Construction

As the Proposed Development total building volume is estimated to be >75,000m^3, the potential dust emission magnitude for construction works is categorised as **large**.

Trackout

There would be <20 outward HGV movements per day during construction, and given the location of the Proposed Development, it is likely that access would be via a short section of unpaved road (< 50m). Therefore, the potential dust emission magnitude for the trackout phase is categorised as **small**.

9.5.1.3 Step 2B – Definition of the Sensitivity of the Area

The receptor sensitivity is categorised as **high** to dust soiling effects as locations where users can reasonably expect enjoyment of a high level of amenity; or the appearance, aesthetics or value of property would be diminished by soiling; and people/property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land located within 250m of the Proposed Development. As highly sensitive receptors are located within 20m of the Proposed Development, the sensitivity of the area to dust soiling effects is considered to be **high**.

The receptor sensitivity is categorised as **high** to human health as there are residential properties where members of the public may be exposed over a time period relevant to the 24-hour objective for PM_{10} within 250m of the Proposed Development. However, the sensitivity of the area to human health effects is considered to be **low**, due to the baseline annual mean PM_{10} concentration in 2024 being 10.4µg/m^3 and there are ≤100 sensitive receptors (residential properties) within 100m of the Proposed Development.

9.5.1.4 Step 2C – Define the Risk of Impacts

The magnitude of emissions and area sensitivity are combined to determine the risk of effects as shown in Table 9-6.

Table 9-6: Summary of Risk of Dust Effects for Construction Phase Activities

Potential Effect Type	Summary of Dust Risk		
	Earthworks	Construction	Trackout
Dust Soiling	Medium Risk	High Risk	Low Risk
Human Health	Low Risk	Low Risk	Negligible

9.5.2 Operational Phase

The local air quality assessment has predicted annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations at worse case sensitive receptors for the Proposed Development 2029 opening year, with results provided in Table 9-7. As stated in Section 9.3.3, no ecological receptors are located within the study area.

Table 9-7: Annual Mean NO_2, PM_{10} and $PM_{2.5}$ Concentrations at Selected Receptors

Receptor	2029 Annual Mean NO_2 Concentrations (µg/m^3)		2029 Annual Mean PM_{10} Concentrations (µg/m^3)		2029 Annual Mean $PM_{2.5}$ Concentrations (µg/m^3)		Change in annual mean concentrations (µg/m^3)		
	DM	DS	DM	DS	DM	DS	NO_2	PM_{10}	$PM_{2.5}$
1	11.9	11.9	13.3	13.3	7.7	7.7	<0.1	<0.1	<0.1
2	11.7	11.7	12.8	12.9	7.4	7.5	<0.1	0.1	0.1
3	11.0	11.1	11.0	11.2	6.5	6.6	0.1	0.2	0.1
4	11.0	11.1	10.9	11.1	6.4	6.5	0.1	0.2	0.1
5	11.2	11.3	11.6	11.6	6.8	6.8	0.1	<0.1	<0.1
6	11.0	11.0	10.9	10.9	6.4	6.4	<0.1	<0.1	<0.1
7	13.0	13.1	16.2	16.4	9.2	9.3	0.1	0.2	0.1
8	13.8	13.8	19.5	19.5	10.9	10.9	<0.1	<0.1	<0.1
9	-	11.1	-	11.1	-	6.5	-	-	-

*DM (Do-Minimum, without the Proposed Development), DS (Do-Something, with the Proposed Development)

The results indicate that all receptors are predicted to experience annual mean NO_2, PM_{10} and $PM_{2.5}$ below their relevant AQLVs. The highest annual mean NO_2 concentration with the Proposed Development operation, was predicted at a receptor located on the R120, Fitzmaurice Road (R8). The annual mean NO_2 concentration at this receptor in the DS scenario was predicted to be 13.8µg/m^3. At the same receptor, an annual mean PM_{10} concentration of 19.5µg/m^3 was modelled, which is just below the AQLV.

The largest change in NO_2 annual mean concentration was 0.1µg/m^3, predicted at receptors on Greenogue Drive, Mullaly's Lane, Stoney Hill Road and Main Street (between Coolamber Road an R120 Bridge). This is due to the change in traffic flow on these roads and the proximity of the receptors to the emission source (i.e. the road).

The largest change in PM_{10} annual mean concentration was 0.2µg/m^3 predicted at receptors on Greenogue Drive, Mullaly's Lane and Main Street (between Coolamber Road an R120 Bridge). This is due to an additional 454 vehicles predicted to use this road each day and the proximity of the receptors to the emission source (i.e. the road).

The largest change in $PM_{2.5}$ annual mean concentration was 0.1µg/m^3 predicted at receptors on Stoney Lane, Greenogue Drive, Mullaly's Lane and Main Street (between Coolamber Road an R120 Bridge). This is due to the change in traffic flow on these roads and the proximity of the receptors to the emission source (i.e. the road).

Receptor 9 represents a 'worse case' proposed receptor, located on the boundary of the Proposed Development. At this receptor, annual mean NO_2, PM_{10} and $PM_{2.5}$ are all well below their respective limit values and therefore indicates that the Proposed Development would not introduce sensitive receptors to an area of poor air quality.

With reference to Table 9-5, the effects of the Proposed Development on air quality are considered to be neutral and not-significant.

9.5.3 Indirect, Secondary & Transboundary Effects

The EPA Guidelines on Environmental Impact Assessment Reports states that indirect and secondary effects are those that are not a direct result of the project and are often produced away from the project site or because of a complex pathway.

The focus of local air quality impacts in local air quality assessments is typically on the direct effect caused by emissions to air. This includes the potential for harm to human health, harm to sensitive nature conservation habitats, and harm to amenity, due to increased levels of exposure to the pollutants generated by a proposed development close to the source of emissions.

With regards to air quality, indirect and secondary effects are less prevalent than for other environmental disciplines. The limited indirect and secondary effects that could potentially occur as associated with the Proposed Development include emissions to air generated by the following sources:

- Energy plant combustion and process emissions associated with the manufacture of building materials to enable the construction of the Proposed Development; and
- Energy plant combustion emissions associated with power generation required to charge electric vehicles that are used to access the Proposed Development.
- Given the nature and scale of the Proposed Development, any additional emissions generated by these sources as a result of the Proposed Development's construction and operation would be negligible when considered against these sources' total emissions.
- Considering the above, indirect and secondary effects on local air quality are not considered significant and are not assessed further in this assessment.

9.6 Mitigation Measures

9.6.1 Construction Phase

Determining site-specific mitigation measures corresponds to Step 3 of the construction dust impact assessment methodology (IAQM, 2024).

A number of mitigation measures can be adopted to reduce the production and/or dispersal of dust to lessen the harm to amenity and limit human health impacts. Ideally dust should be controlled at the source as once airborne it is more difficult to suppress.

Appropriate mitigation measures are provided in the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2024).

According to the IAQM Guidance (IAQM, 2024), the dust risk for each of the activities determined in Step 2C should be used to define the appropriate site-specific mitigation measures to be adopted. Where a negligible risk of dust effects was determined, no mitigation measures, beyond those required by legislation are required. However, mitigation measures may be applied as part as good practice. Table 9-8 lists the measures recommended by the IAQM as being highly recommended for the level of dust risk identified for the Proposed Development.

Table 9-8: Potential Site Operations and Possible Methods of Controlling Dust

Activity	Possible Dust Control Methods
Communication	• Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary; • Display the head or regional office contact information; • Develop and implement a Dust Management Plan (DMP); and

Activity	Possible Dust Control Methods
	• Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.
Site Management	• Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken; • Make the complaints log available to the local authority when asked; and • Record any exceptional incidents that cause dust and/or air emissions, either on or off site and the action taken to resolve the situation in the log book.
Monitoring	• Undertake daily on-site and off-site inspections, where receptors (including roads) are nearby, to monitor dust, record inspection results and make the log available to the local authority when asked; • Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions; and • Carry out regular site inspections to monitor compliance with the DMP, record inspection results and make an inspection log available to the local authority when asked.
Preparing and maintaining the site	• Plan site layout so that machinery and dust causing activities are located away from receptors as far as possible; • Erect solid screens or barriers around dusty activities that are at least as high as any stockpiles on site; • Avoid site run-off of water or mud; • Keep site fencing, barriers and scaffolding clean using wet methods; • Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site; and • Cover, seed or fence stockpiles to prevent wind whipping.
Operating vehicle/machinery and sustainable travel	• Ensure all vehicles switch off engines when stationary – no idling vehicles; • Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable; and • Impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work area.
Operations	• Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays; • Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation; • Use enclosed chutes and conveyors and covered skips; and • Minimise drop heights.
Waste Management	• Avoid bonfires and burning of waste materials.
Earthworks	• Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable; • Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable; and • Only remove the cover in small areas during work and not all at once.
Construction	• For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust; • Avoid scabbling, if possible; and • Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out.
Track out	• Use water assisted dust sweeper(s) on the access and local roads, to remove, as necessary any material tracked out of the site; • Avoid dry sweeping of large areas; • Ensure vehicles entering and leaving the site are covered to prevent escape of materials during transport; and • Implement a wheel washing system.

9.6.2 Operational Phase

The operational phase assessment determined that the potential air quality effects would be not significant, therefore no mitigation measures are recommended.

9.7 Residual Impacts

9.7.1 Construction Phase

Determining the residual effects corresponds to Step 4 of the construction dust assessment methodology.

The effects associated with the construction phase of the Proposed Development have been qualitatively assessed with reference to the IAQM published draft 'Guidance on the Assessment of Dust from Demolition and Construction' (IAQM, 2024). The assessment of construction dust and PM_{10} emissions defines the level of risk associated with the Proposed Development construction works, and in turn, informs which standard control measures are required in order to mitigate emissions to the extent that a significant impact does not occur.

The IAQM guidance states that:

"in the case of demolition/construction it is assumed that mitigation (secured by planning conditions, legal requirements or required by regulations) will ensure that a potential significant adverse effect will not occur, so the residual effect will normally be 'not significant'."

The dust control measures listed in Table 9-8, where practicality allows, would mean that residual effects as a result of construction dust and PM_{10} emissions are negligible.

Therefore, overall it is considered that the residual dust effects as a result of the Proposed Development's construction are not significant.

9.7.2 Operational Phase

As no operational phase mitigation measures are recommended, the residual air quality effects are as described in Section 9.5.2 and considered to be not significant.

9.8 Cumulative Impacts

9.8.1 Construction

There are two planning applications for sites within 250m of the Proposed Development which have had permission granted. One application is for house improvements at a single dwelling on Coolamber Drive which will likely result in minimal dust impacts. The second application is for a new primary school, located adjacent to the Proposed Development; however, the construction programme does not overlap with the Proposed Development construction phase and therefore there would be no cumulative dust effects.

If the construction programme of future applications overlaps with the construction phase of the Proposed Development and a receptor is located within 250m of both construction works, there is the potential for cumulative effects. It is assumed that the other developments would implement appropriate dust mitigation measures as is standard practice on all well managed construction sites. This would ensure that cumulative dust impacts and effects would remain not significant.

9.8.2 Operational

As discussed above, two planning applications for sites within 250m of the Proposed Development have been granted permission. The application for the new primary school will result in a change in traffic flow on the local road network. The primary school will be operational prior to 2029 (opening year of the Proposed Development) and therefore has been included in the traffic data in both the Do-minimum and Do-something scenarios.

Table 9-7 indicates that with both the Proposed Development and primary school operational, all receptors are predicted to experience annual mean NO_2, PM_{10} and $PM_{2.5}$ below their relevant AQLV.

9.9 'Do Nothing' Scenario

As discussed in Section **Error! Reference source not found.** Baseline Environment, baseline air quality in the vicinity of the Proposed Development is considered to be good, with annual mean NO_2, PM_{10} and $PM_{2.5}$ concentrations below their respective AQLVs as defined in the EU Ambient Air Quality Directive (European Parliament and Council, 2024).

In the absence of the Proposed Development (the "Do-Nothing" scenario), air quality within the study area is expected to broadly reflect existing baseline conditions. Over time, gradual improvements in vehicle technology, emission standards and an increasing proportion of lower-emission and electric vehicles within the national fleet are likely to contribute to incremental improvements in ambient air quality. Taking this into consideration, it is anticipated that, under the Do-Nothing scenario, there would be no significant change in local air quality conditions, and pollutant concentrations would be expected to remain below the relevant air quality objectives.

9.10 Summary

The air quality assessment has considered the potential local air quality effects of the Proposed Development during both the construction and operational phases.

A qualitative construction phase assessment was undertaken in accordance with IAQM Guidance on the Assessment of Dust from Demolition and Construction (IAQM, 2024). With regard to potential impacts during the construction phase, the air quality assessment concludes the following:

- The nearest receptors to the Site are the residential properties located on Greenogue Drive, Mulally's Lane, Coolamber Road, Coolamber Drive and Beechwood Lawns, with additional receptors within the 250m assessment area;
- Taking into consideration the sensitivity of the area to human health effects as well as the potential magnitude of the impact; the potential risk of human health impacts is considered to be low during earthworks and construction works and negligible during track out;
- Taking into consideration the sensitivity of the area to dust soiling effects as well as the potential magnitude of the impact, the potential risk of dust soiling impacts is considered to be medium during earthworks, high during construction works and low during track out;
- Appropriate mitigation measures have been recommended to effectively control the dust effects during the construction phase.

Overall, it is considered that the dust effects during the Proposed Development construction phase would not be significant.

A quantitative operational phase assessment has been undertaken utilising the TII REM tool, with annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ predicted at sensitive receptors. The impacts and effects have been defined with reference to the IAQM guidance (IAQM, 2017). The assessment concludes the following:

- All receptors are predicted to experience annual mean NO_2, PM_{10} and $PM_{2.5}$ below their relevant AQLVs;
- The largest predicted change in NO_2 and $PM_{2.5}$ annual mean concentrations was 0.1µg/m^3, while the largest change in annual mean PM_{10} concentration was 0.2µg/m^3;
- The largest changes in pollutant concentrations were predicted at receptors on Greenogue Drive, Mullaly's Lane, Stoney Lane and Main Street (between Coolamber Road an R120 Bridge). This is due to anticipated increases in traffic flow on the local road network associated with the Proposed Development, with the largest increase of 454 vehicles per day predicted on Greenogue Drive and Mullaly's Lane and the proximity of the receptors to the emission source (i.e. road);
- A receptor located on the Site boundary to represents a 'worse case' proposed receptor at the Proposed Development, is predicted to experience annual mean NO_2, PM_{10} and $PM_{2.5}$ well below their respective AQLVs and therefore indicates that the Proposed Development would not introduce sensitive receptors to an area of poor air quality.

The effects of the Proposed Development on air quality during the operational phase are considered to be neutral and not-significant.

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