7 Air Quality

7.1 Introduction

This chapter of the Environmental Impact Assessment Report (EIAR) considers the potential air quality impacts as a result of the Proposed Project.

The Proposed Project is the restoration of disused quarry lands using clean soil and stone from construction and demolition. The Application Site (also referred to as 'Site') includes a disused quarry void and associated historical working areas. It also includes a private access road that connects the disused quarry to the public road network, and agricultural lands to the east of that road where it is proposed to locate the temporary facilities required to manage the importation of clean soil and stone required for the Proposed Project.

All lands within the Application Site are within the ownership of the Applicant, Bison Quarries Ltd (BQL). The Application Site is located in townland of Coolsickin or Quinsborough, Co. Kildare

This EIAR is submitted in support of an application under Section 37L of the Planning and Development Act 2000, as amended.

This chapter of the EIAR has been prepared by WSP Ireland Consulting Ltd (WSP) and assesses the potential air quality impacts associated with the Proposed Project. It should be read together with Chapter 2 (Project Description), Chapter 4 (Ecology and Biodiversity), Chapter 8 (Climate), and Chapter 12 (Traffic and Transport).

The assessment has been prepared by and Shivank Mishra (BE, MTech) and reviewed by Katie Armstrong (BSc, MSc). Katie is a member of the Air and Waste Management Association (A&WMA) and has over 18 years of experience preparing air quality assessments. Shivank is a Member of Institution of Environmental Sciences (IES) and a Member of the Institute of Air Quality Management (IAQM); he has over a year experience.

7.1.1 Technical Scope

The EIA Directive (Directive 2011/92/EU, as amended by Directive 2014/52/EU) requires that a description of the likely significant effects of the Proposed Project on the environment resulting from air pollutant emissions is provided.

The technical scope of this assessment is to consider the potential air quality impacts associated with the Proposed Project. This assessment considers the potential sources of change resulting from the Proposed Project activities detailed in the project description (Chapter 2 of this EIAR) and summarised in section 7.1.3.

7.1.1.1 Items Screened into the Assessment

Mineral Dust

The most likely emissions to air are dust and particulate matter (e.g., PM_{10} and $PM_{2.5}$) which arise predominantly from the handling and transport of fill materials during the construction phase. These tend to be fugitively dispersed source emissions rather than specific point source emissions and this dictates the mitigation measures required. Consequently, a qualitative assessment of dust impacts associated with dust from the quarry restoration activities has been undertaken in line with Institute of Air Quality Management's (IAQM) 'Guidance on the Assessment of Mineral Dust Impacts for Planning'.

Vehicle Trackout

Vehicle trackout refers to the transport of dust and dirt from the Application Site onto the public road network. In this project, heavy duty vehicles (HDVs) will be used to import infill material such as clean soils and stones. As these vehicles enter and exit the Site, there is potential for dusty material to spill or for mud and dust to be transferred onto the road from the site surface. These materials can then be re-suspended by passing traffic, leading to potential local air quality impacts.

The IAQM's guidance on the 'Assessment of Dust from Demolition and Construction' requires consideration of sensitive human receptors within 50m of the route(s) used by vehicles on the public highway, up to 250m from the Site entrance(s). For sensitive ecological receptors, which are defined in the guidance as including Ramsar sites, Special Protection Areas (SPA), Special Areas of Conservation (SAC) or any other ecological sites identified as sensitive to dust deposition the same criteria are used.

Plant and Non-Road Mobile Machinery Emissions

The IAQM's guidance on the 'Assessment of Dust from Demolition and Construction' guidance states that:

"Experience of assessing the exhaust emissions from on-site plant (NRMM) and site traffic suggests that they are unlikely to make a significant impact on local air quality, and in the vast majority of cases they will not need to be quantitatively assessed".

Consequently, impacts associated with the operation of site plant and non-road mobile machinery (NRMM) emissions during the operational life of the quarry have been assessed qualitatively.

7.1.1.2 Items Screened Out of the Assessment

Road Vehicle Emissions

Chapter 12 (Traffic and Transport) summarises the operational traffic data for the Proposed Project. There are three inbound and three outbound light-duty vehicle (LDV) trips per day as well as miscellaneous trips which account for four further LDV trips per day (two inbound and two outbound, i.e., an increase in LDV movements of 10 AADT (annual average daily

traffic, vehicles per day). During the operational period heavy-duty vehicle (HDV, >3.5t) movements from material import activities will also for an increase in 36 AADT, (18 inbound and 18 outbound trips per day).

Consequently, the change in operational traffic flows do not exceed the indicative scoping criteria given for determining the need for a detailed air quality assessment provided in the Environmental Protection UK (EPUK) / IAQM 'Land-Use Planning and Development Control: Planning for Air Quality' guidance. Therefore, the potential impacts form operational traffic emissions can be considered as having an insignificant effect on local air quality.

Odour Emissions

Clean soil and stone will be used for quarry restoration during the Proposed Project, which do not give rise to odours. Therefore, consideration of operational odour emissions has been screened out and are not considered further.

Point Source Emissions

No substantial stationary combustion processes or point source emissions to air will form part of the operations of the Proposed Project, therefore consideration of emissions to air have also been screened out of this assessment and are not considered further.

Carparking Area

The Proposed Project includes the construction of associated temporary operational facilities required to facilitate the quarry restoration (e.g. site facilities, site management, site access upgrades).

The duration of the construction works for the car park and associated site infrastructure would only consist of a couple of months and best practice mitigation measures to limit the generation of construction dust and PM_{10}, as outlined in the IAQM guidance, will be employed throughout to minimise the risk of any impacts at sensitive receptors, e.g., the use of a water bowser to suppress dust.

Taking this into consideration, together with the remote location of the Site and limited number of sensitive human receptors in close proximity, no significant residual effect is anticipated and further consideration of the impacts arising from this element of the proposals have been screened out and are not considered further.

7.1.2 Geographical and Temporal Scope

The land which is the subject of this EIAR is located within the EIA project boundary (as a minimum) and is shown in Figure 7-1. The figure also includes the study areas for the items screened into the assessment (given above) and these are described below.

Different study areas have been used for the baseline and construction phase assessments covering consideration of the impacts associated with quarry restoration activities, trackout, plant and NRMM emissions on sensitive human receptors. The study areas have been

defined through reference to the appropriate guidance (given above), beyond these distances no significant effects are anticipated.

The Application Site extends to approximately 6.63 ha and is located within the EIA boundary for the EIAR (approximately 10.62 ha). The proposed fill area is approximately 6.05 ha and is located entirely within the EIA boundary and the Application Boundary.

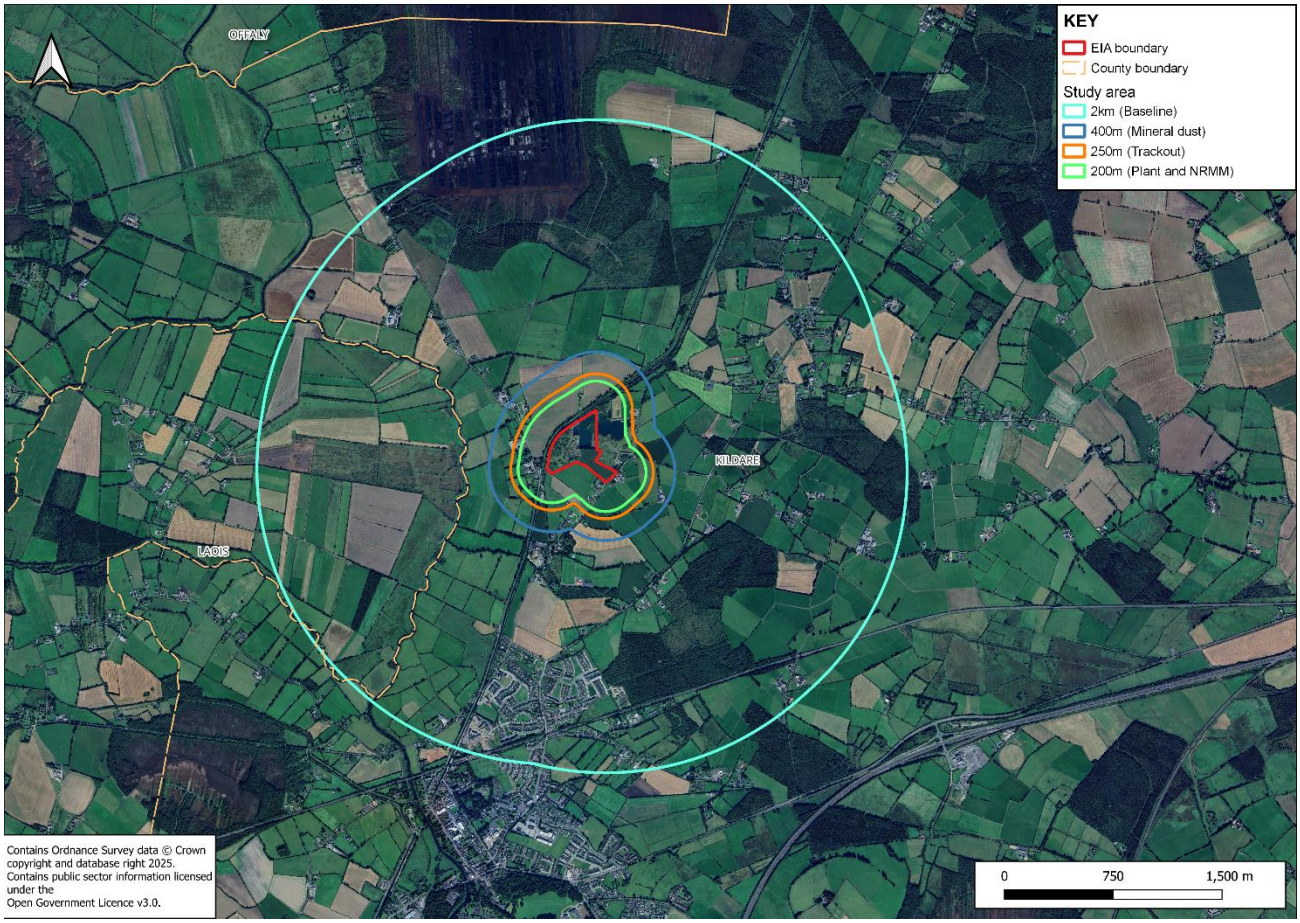


Figure 7-1: Assessment Study Areas

7.1.2.1 Geographical Scope

Baseline

The baseline study area comprises lands within 2 km of the EIA boundary. Where air quality data is unavailable, the study area has been extended as required to allow for the inclusion of additional data, e.g., monitoring data, indicative of conditions at the Proposed Project. Likewise, where data is not available for the assessment period, the best available data, i.e., most recent, has been used and this noted in the assessment.

Mineral Dust

The study area for the assessment of dust from construction activities extends 400m from the EIA boundary; this area includes both non-sensitive, i.e., commercial premises and businesses, and sensitive human receptors, i.e. residential properties.

Trackout

The study area for the assessment of dust from track out extends 50m from the route used by Site vehicles on the public highway, up to 250m from the site entrance; this area includes both non-sensitive, i.e., commercial premises and businesses, and sensitive human receptors, i.e. residential properties.

Plant and Non-Road Mobile Machinery (NRMM) Emissions

The study area for the assessment of plant and NRMM emissions extends 200m from the EIA boundary; this area includes sensitive human receptors (residential properties).

7.1.2.2 Temporal Scope

The temporal scope of the assessment covers 10 years of construction activities and its duration is defined as 'medium-term' (lasting seven to 15 years). It is noted that there will be a further three years of aftercare and maintenance of the lands as part of the Aftercare and Maintenance Phase but no major air emission sources associated with this phase and it has therefore not been considered further in this assessment.

Full details of the Proposed Project to be carried out within the Application Site are provided in Chapter 2 (Project Description) and summarised in section 7.1.3. Proposed Project activities and development include:

- Enabling works carried out at the start of the construction phase. This comprises installation of the site office and temporary site facilities required to facilitate the import of clean soil and stone;
- Acceptance of clean soil and stone to the Application Site during construction phase. All soils to be imported are to be greenfield or equivalent greenfield;
- Construction phase works required to restore ground contours at the Site to levels similar to those predicted to have been present prior to the historical extraction activities carried out to the north of the Application Site, i.e., infilling of an existing quarry void space and immediately surrounding lands using with clean soil and stone; and
- Topsoil stripping and/or stockpiling during construction phase.

7.1.3 Project Description Summary

The Proposed Project consists of the restoration of lands through the import of approximately 720,000 tonnes clean soil and stone as by-product (non-waste) from development sites to infill a disused historical quarry and raise ground levels to tie in with ground levels of surrounding land.

Restoration of the lands will be to agricultural grassland, an artificial waterbody, and a hedgerow habitat with the lands returned to their pre-extraction agricultural use.

The proposed duration of infilling is 10 years depending on market conditions for the anticipated acceptance of clean soil and stone, and a further 3 years for the completion of final restoration activities.

The Application Site is located in the townland of Coolsickin or Quinsborough, Co Kildare. The Application Site is accessed by a privately-owned access road connecting to a local road (L7049).

The following temporary facilities will be installed and maintained during the life of the development:

- office and fully serviced welfare facilities;
- weighbridge and associated portacabin;
- closed-system wheel wash;
- 6 no. parking bays;
- 2 no. waste inspection bays and 1 no. bunded waste quarantine area;
- hardstanding area (vehicle movement and storage);
- surface water drainage infrastructure from hard standing and discharge to ground, including 2 no. interceptors and 2 no. soakaways;
- Security features, including security gates and fencing; and.
- Power supply. It is intended that approval will be sought for a connection to the ESB Network for the office and fully serviced welfare facilities. Diesel generators will be used to power mobile lighting, if required.

The Proposed Project site entrance and private access road will be upgraded and realigned. These will be retained following to completion of the Proposed Project.

A full project description in provided in Chapter 2 of this EIAR.

7.2 Legislative and Policy Context

7.2.1 Legislation

7.2.1.1 Nuisance Dust

The impact of dust is usually monitored by measuring rates of dust deposition. According to the Environment Protection Agency (EPA) guidance 'Environmental Management in the Extractive Industries', there are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral dust.

A number of methods are available to measure dust deposition but only the German TA Luft Air Quality Standards specify a method of measuring dust (nuisance) deposition – the Bergerhoff Method (German Standard VDI 2119).

On this basis, the EPA recommend a boundary dust deposition limit value of 350 mg/m^2/day (when averaged over a 30-day period (one month), +/- two days).

7.2.1.2 Air Pollutants

European Air Quality Directives

The European Union (EU) Directive on Ambient Air Quality Assessment and Management came into force in September 1996 (96/62/EC) and defines the policy framework for 12 air pollutants known to have harmful effects on human health and the environment. Air quality

limit values (ambient pollutant concentrations not to be exceeded after a given date) for the pollutants are set through a series of Daughter Directives. The first Daughter Directive (1999/30/EC) sets limit values for NO_2 and PM_{10} (amongst other pollutants) in ambient air.

Following the Daughter Directives, EU Council Directive 2008/50/EC on ambient air quality and cleaner air for Europe (known as the 'CAFE' Directive) came into force in June 2008, consolidating the existing air quality legislation, making provision for Member States to postpone attainment deadlines and allowing exemption from the obligation to limit values for certain pollutants, subject to strict conditions and assessment by the European Commission. Directive 2008/50/EC was transposed into Irish legislation in 2011 through The Air Quality Standards Regulations 2011. The Directive merged the four daughter directives and EU Council decision into a single directive on air quality. The new Directive also introduced a new limit value for $PM_{2.5}$ but does not change the existing air quality standards.

National Air Quality Legislation

The Air Pollution Act 1987 is the primary legislation relating to air quality in Ireland and provides the means for local authorities to take the measures that they deem necessary to control air pollution.

SI 180/2011 - Air Quality Standards Regulations (2011) transpose the Directive on ambient air quality (2008/50/EC) into Irish law. These regulations establish limit values and thresholds for various pollutants in ambient air, the relevant air quality standards used in this assessment are given in **Table 7-1**.

Table 7-1 - Relevant Air Quality Standards

Air Pollutant	Averaging Period	Standard (µg/m^3)
Nitrogen dioxide (NO_2)	Annual	40
	1-hour	200 (Not to be exceeded more than 18 times in a year)
Particulate Matter (PM_{10})	Annual	40
	24-hour	50 (not to be exceeded more than 35 times a year)
Particulate Matter ($PM_{2.5}$)	Annual	20

The EPA monitor the levels of pollutants against the standards set out in EU and Irish legislation and act as the 'competent authority' for annual reporting to the Minister for the Environment, Climate and Communications.

There are four air quality Zones in Ireland, defined for air quality management and assessment purposes. Highly populated areas are classified as Zone A, with sparsely

populated areas as Zone D. The Proposed Project is located within a designated Zone D for air quality reflecting its rural setting.

7.2.1.3 Other Relevant Legislation

The relevant legislation considered in the assessment include:

- European Communities (Environmental Impact Assessment Regulations) 1989 (SI No. 349/1989);
- Section 177F of the Planning & Development Act 2000 (as amended);
- Directive 2014/52/EU of the European Parliament and of the Council (amending Directive 2011/92/EU);
- European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018, SI 296/2018;
- Planning and Development Regulations 2001 (as amended); and
- Mines and Quarry Act 1965.

7.2.2 Relevant Policies and Plans

Kildare County Council have published a country development plan covering the initial temporal period of the assessment (up to 2029). The plan policies of relevance to this assessment are given below.

7.2.2.1 Kildare County Development Plan 2023-2029

The Kildare County Development Plan 2023-2029 contains the council's current policies relating to planning and sustainable development across their administrative area. KCC has adopted policies and objectives within the development plan in relation to the protection of environs from adverse environmental impact from extractive industry.

The plan acknowledges the potential environmental effects of the aggregate industry and importance of protecting surrounding residential and natural amenities. It identifies that gravel resources are important to the general economy providing a valuable source of employment in some areas of the county. It acknowledges that there is an increasing demand for aggregates and that areas for extraction of aggregates and minerals are needed in the county. To address this the plan identifies that planning policies should be carefully considered to avoid adverse effects on aggregate resources and related extractive industries. It notes that it is necessary to ensure that aggregates can be sourced without significantly damaging the landscape, environment, groundwater and aquifer sources, road network, heritage and / or residential amenities of the area.

KCC policies relevant to the assessment of air quality in respect to the extraction industry include:

- ***RD P8*** – (It is the policy of KCC to) *Support and manage the appropriate future development of Kildare's natural aggregate resources in appropriate locations to ensure*

adequate supplies are available to meet the future needs of the county and the region in line with the principles of sustainable development and environmental management and to require operators to appropriately manage extraction sites when extraction has ceased.

- ***RD O42*** – (It is the policy of KCC to) *Ensure that development for aggregate extraction, processing and associated concrete production does not significantly impact the following:*
  - *Special Areas of Conservation (SACs);*
  - *Special Protection Areas (SPAs);*
  - *Natural Heritage Areas (NHAs);*
  - *Other areas of importance for the conservation of flora and fauna;*
  - *Zones of Archaeological Potential;*
  - *The vicinity of a recorded monument;*
  - *Sensitive landscape areas as identified in Chapter 13 of this Plan;*
  - *Scenic views and prospects;*
  - *Protected Structures;*
  - *Established rights of way and walking routes; and*
  - *Potential World Heritage Sites in Kildare on the UNESCO Tentative List, Ireland.*
- ***RD O44*** – (It is the policy of KCC to) *Require applications for mineral or other extraction to include (but not limited to):*
  - *An Appropriate Assessment Screening where there is any potential for effects on a Natura 2000 site;*
  - *An Environmental Impact Assessment Report (EIAR); and*
  - *An Ecological Impact Assessment may also be required for subthreshold developments to evaluate the existence of any protected species / habitats on site*.
- ***RD O49*** – (It is the policy of KCC to) *Have regard to the following guidance documents (as may be amended, replaced, or supplemented) in the assessment of planning applications for quarries, ancillary services, restoration and after-use:*
  - *Quarries and Ancillary Activities: Guidelines for Planning Authorities, DeHLG (2004). - Environmental Management Guidelines;*
  - *Environmental Management in the Extractive Industry (Non-Scheduled Minerals), EPA (2006). - Archaeological Code of Practice between the DeHLG an ICF (2009);*
  - *Geological Heritage Guidelines for the Extractive Industry (2008); and*

- *Wildlife, Habitats, and the Extractive Industry – Guidelines for the protection of biodiversity within the extractive industry, NPWS (2009).*

7.2.3 Relevant Guidance

This assessment has been undertaken with reference to the following guidance:

- Environmental Protection Agency 'Annual Air Quality in Ireland Report' (2023);
- Health and Safety Authority Safe Quarry 'Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations' (2008);
- Department of the Environment, Heritage and Local Government 'Quarries and Ancillary Activities - Guidelines for Planning Authorities' (2004);
- IAQM 'Guidance on the Assessment of Dust from Demolition and Construction' (2024);
- EPA 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports' (2022);
- EPUK / IAQM 'Land-Use Planning and Development Control: Planning for Air Quality' (2017);
- IAQM 'Guidance on the Assessment of Mineral Dust Impacts for Planning' (2016);
- European Commission 'Climate Change and Major Projects' (2016);
- Department for Environment, Food and Rural Affairs (Defra, UK) 'Process Guidance Note 3/16 (12) - Secretary of State's Guidance for Mobile Crushing and Screening' (2012); and
- EPA 'Environmental Management in the Extractive Industries' (2006).

7.3 Assessment Methodology and Significance Criteria

7.3.1 Mineral Dust

The following section details the IAQM methodology used for assessing the impacts of deposited dust and fine particulates from the quarry restoration activities. It follows a standard source-pathway-receptor methodology.

The residual source emissions have been characterised based on the scale of the operations and the Project activities and are classified as either small, medium or large. Guidance on the appropriate scale of the residual source is provided in the 2016 IAQM guidance (in Appendix 4 therein).

The pathway from the source to the receptor has been assessed considering the distance and direction of receptors to the source relative to the prevailing wind and local meteorology. Local meteorological data has also been used to assess the frequency of the winds in each direction. The guidance states that it is commonly accepted that the greatest impacts will occur within 100m of the source and that deposited dust does not generally travel beyond 400 m therefore all (sensitive and non-sensitive) receptors within this distance of the boundary are considered.

The criteria for the categorisation of the frequency of potentially dusty winds (given in Table 7-2) and the receptor distance from source (given in Table 7-3) is used to define the pathway effectiveness (given in Table 7-4). The residual source emissions and the pathway effectiveness are then combined to predict the Dust Impact Risk as shown in Table 7-5.

Table 7-2- Categorisation of Potentially Dusty Winds

Pathway	Criteria
Infrequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are less than 5%
Moderately Frequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are between 12% and 20%
Very Frequent	Frequency of winds (>5 m/s) from the direction of the dust source on dry days are greater than 20%

Table 7-3 - Categorisation of Receptor Distance from Source

Category	Criteria
Distant	Receptor is between 200m and 400m in an unobstructed direction from the dust source
Intermediate	Receptor is between 100m and 200m in an unobstructed direction from the dust source
Close	Receptor is less than 100m in an unobstructed direction from the dust source

Table 7-4 - Pathway Effectiveness

		Frequency of Potentially Dusty Winds			
		Infrequent	**Moderately Frequent**	**Frequent**	**Very Frequent**
Receptor Distance Category	**Close**	Ineffective	Moderately Effective	Highly Effective	Highly Effective
	Intermediate	Ineffective	Moderately Effective	Moderately Effective	Highly Effective
	Distant	Ineffective	Ineffective	Moderately Effective	Moderately Effective

Table 7-5 - Estimation of Dust Impact Risk

		Residual Source Emissions		
		Small	**Medium**	**Large**
Pathway Effectiveness	**Highly Effective**	Low Risk	Medium Risk	High Risk
	Moderately Effective	Negligible Risk	Low Risk	Medium Risk
	Ineffective Pathway	Negligible Risk	Negligible Risk	Low Risk

The last step is to assess the likely magnitude of the dust effects associated with the proposed activities (as given in Table 7-6). This is determined using both the dust impact risk and the receptor sensitivity. Receptor sensitivity is classified as either low, medium or high based on the receptor type.

Table 7-6 - Descriptors for Magnitude of Dust Effects

		Receptor Sensitivity		
		Low	**Medium**	**High**
Dust Impact Risk	**High Risk**	Slight Adverse Effect	Moderate Adverse Effect	Substantial Adverse Effect
	Medium Risk	Negligible Effect	Slight Adverse Effect	Moderate Adverse Effect

		Receptor Sensitivity		
		Low	**Medium**	**High**
	Low Risk	Negligible Effect	Negligible Effect	Slight Adverse Effect
	Negligible Risk	Negligible Effect	Negligible Effect	Negligible Effect

7.3.2 Vehicle Trackout

Step 1 - Screening the need for a Detailed Assessment

An assessment will normally be required where there are:

- 'Human receptors' within 50m of the route(s) used by Project vehicles on the public highway, up to 250m from the site entrance(s); and/or
- 'Ecological receptors' within 50m of the route(s) used by Project vehicles on the public highway, up to 250m from the site entrance(s).

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is "negligible".

Step 2 - Define the Potential Dust Emission Magnitude

Table 7-7 shows how the potential dust emission magnitude for vehicle trackout can be defined; it should be noted that not all the criteria need to be met for a particular class. Other criteria may be used if justified in the assessment.

Table 7-7: Examples of Human Receptor Sensitivity to Project Impacts

Dust Emission Magnitude	Criteria
Large	>50 HDVs out / day, dusty surface material (e.g. clay) >100m unpaved roads
Medium	20 - 50 HDVs out / day, moderately dusty surface material (e.g. clay) 50 -100m unpaved roads
Small	<20 HDVs out / day, non-dusty soil <50m unpaved roads

Step 2b - Define the Sensitivity of the Area

Table 7-8, Table 7-9 and Table 7-10 present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM Construction Dust Guidance provides guidance to allow the

sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table 7-8: Sensitivity of the Area to Dust Soiling Effects

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)	
		<20	<50
High	>100	High	High
	10-100	High	Medium
	1-10	Medium	Low
Medium	>1	Medium	Low
Low	>1	Low	Low

Table 7-9: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source (m)	
			<20	<50
High	>32	>100	High	High
		10-100	High	High
		1-10	High	Medium
	28-32	>100	High	High
		10-100	High	Medium
		1-10	High	Medium
	24-28	>100	High	Medium
		10-100	High	Medium
		1-10	Medium	Low
	<24	>100	Medium	Low
		10-100	Low	Low

Receptor Sensitivity	Annual Mean PM_{10} Concentration ($\mu g/m^3$)	Number of Receptors	Distance from the Source (m)	
			<20	<50
		1-10	Low	Low
Medium	>32	>10	High	Medium
		1-10	Medium	Low
	28-32	>10	Medium	Low
		1-10	Low	Low
	24-28	>10	Low	Low
		1-10	Low	Low
	<24	>10	Low	Low
		1-10	Low	Low
Low	-	>1	Low	Low

Table 7-10: Sensitivity of the Area to Ecological Impacts

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

STEP 2C - Define the Risk of Impacts

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. The matrix in Table 7-11 provide a method of assigning the level of risk for. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table 7-11: Risk of Dust Impacts

Sensitivity of surrounding 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

STEP 3 - Site Specific Mitigation

Having determined the risk, it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is considered to be a low, medium or high-risk site. The IAQM Construction Dust Guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

Step 4 – Determine Significant Effects

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the trackout. The application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible.

7.3.3 Plant and Non-Road Mobile Machinery Emissions

The qualitative assessment of operational phase plant and NRMM on sensitive human receptors within 200m of the EIA boundary has considered the number of plant/vehicles operating on-site, their typical operating hours and their locations when determining whether a significant effect is likely to occur.

7.4 Baseline Conditions

7.4.1 Do Nothing Scenario

If the Proposed Project does not proceed, the Site will remain in its current condition as a disused quarry. No construction or infilling activities would take place, and the land will continue to be characterised by the existing quarry void, collected surface water, and naturally regenerated vegetation.

In this scenario, while there may be wind generated dust from exposed quarry surfaces, no mechanical emissions of dust, odour, or combustion-related pollutants would occur, and there would be no additional impact on local air quality or the surrounding environment. The site would remain undisturbed, and existing environmental conditions would be maintained.

7.4.2 Site Location

The Application Site is located in the townland of Coolsickin or Quinsborough, which is situated 2.7km north of Monasterevin and 9km west of Kildare Town. The grid reference coordinates (Irish Transverse Mercator) for the approximate centre of the Site are E663403, N713199. The Proposed Project location is shown in Figure 7-2.

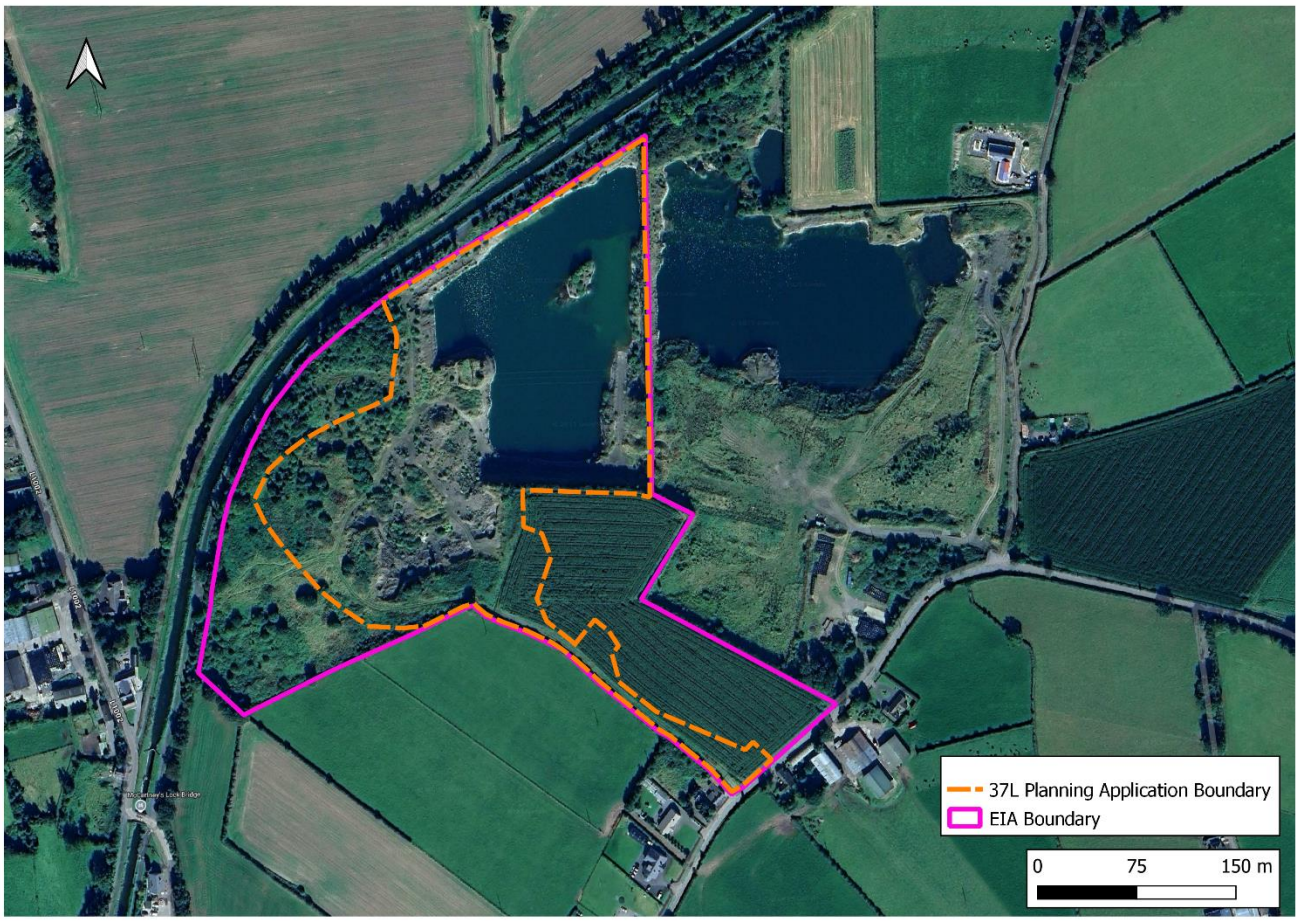


Figure 7-2: Site Location[1]

7.4.3 Climate at the Site

The climate within the Application Site is summarised in Chapter 8 Climate and the local wind field, i.e., the prevailing wind speed and wind direction, which influences the dispersion of dust and air pollutants is summarised below.

The Irish climate is subject to strong maritime influences, the effects decrease with increasing distance from the Atlantic coast. The climate within the study area is typical of the Irish climate, which is temperate maritime.

[1] The Application Site is shown by the '37L Planning Application Boundary'.

A representative Met Éireann station is located at Casement Aerodrome, Baldonnell, County Dublin, approximately 45km northeast of the Application Site. A wind rose based on daily averages of wind speed and wind direction observations for the periods 01 January 2024 to 31 December 2024 measured at Casement Aerodrome is presented in Figure 7-3. This figure shows that the prevailing winds are from the south-west with a small easterly component.

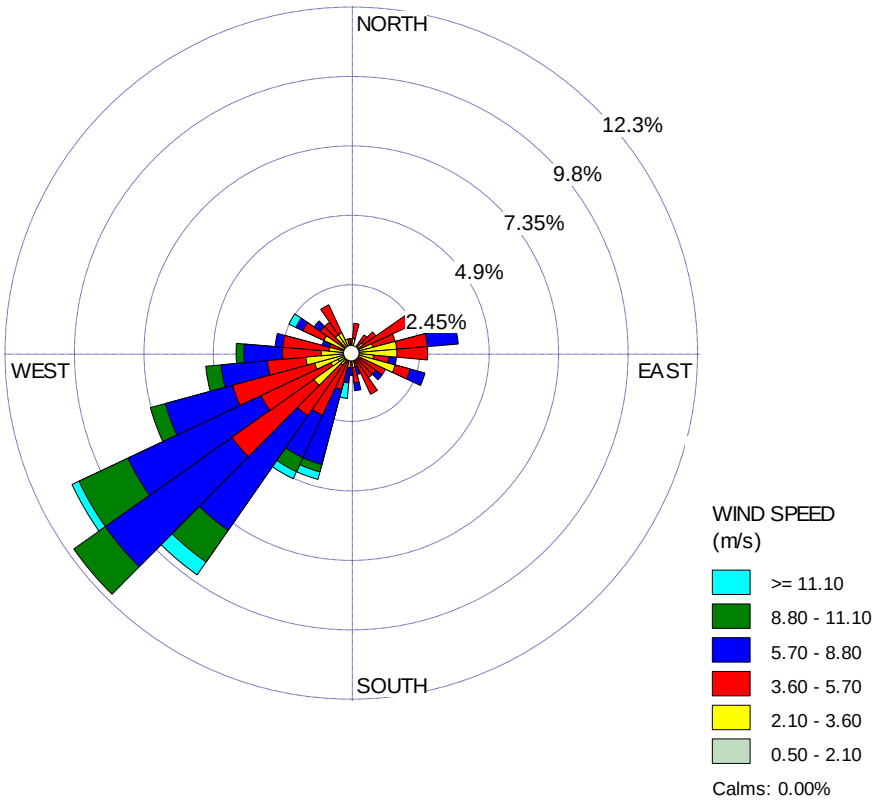


Figure 7-3 - Wind Rose for Casement Aerodrome 2024

7.4.4 Background Air Quality

There are four air quality Zones in Ireland, defined for air quality management and assessment purpose. Highly populated areas are classified as Zone A, with sparsely populated areas as Zone D. Lands within the EIA Boundary are located within a designated Zone D for air quality.

7.4.4.1 Primary Data – Application Site Monitoring Data

Boundary dust monitoring was undertaken at the Application Site on a monthly basis by WSP Ireland Consulting Ltd from 24 May 2024 to 23 August 2024 at a total of three locations which are described in **Table 7-12** and shown in **Figure 7-4.** Laboratory analysis of dust monitoring samples was carried out by BHP laboratories.

Table 7-12: Dust Monitoring Locations

Monitoring Location	Description	Site coordinates (based on ITM grid reference, m)	
		X	Y
DS01	Located in the south boundary corner of the Application Site, approximately 150m from the entrance.	663416	713011
DS02	Located near the north boundary of the Application Site.	663351	713233
DS03	Located near the southwest boundary of the Application Site.	663207	713004

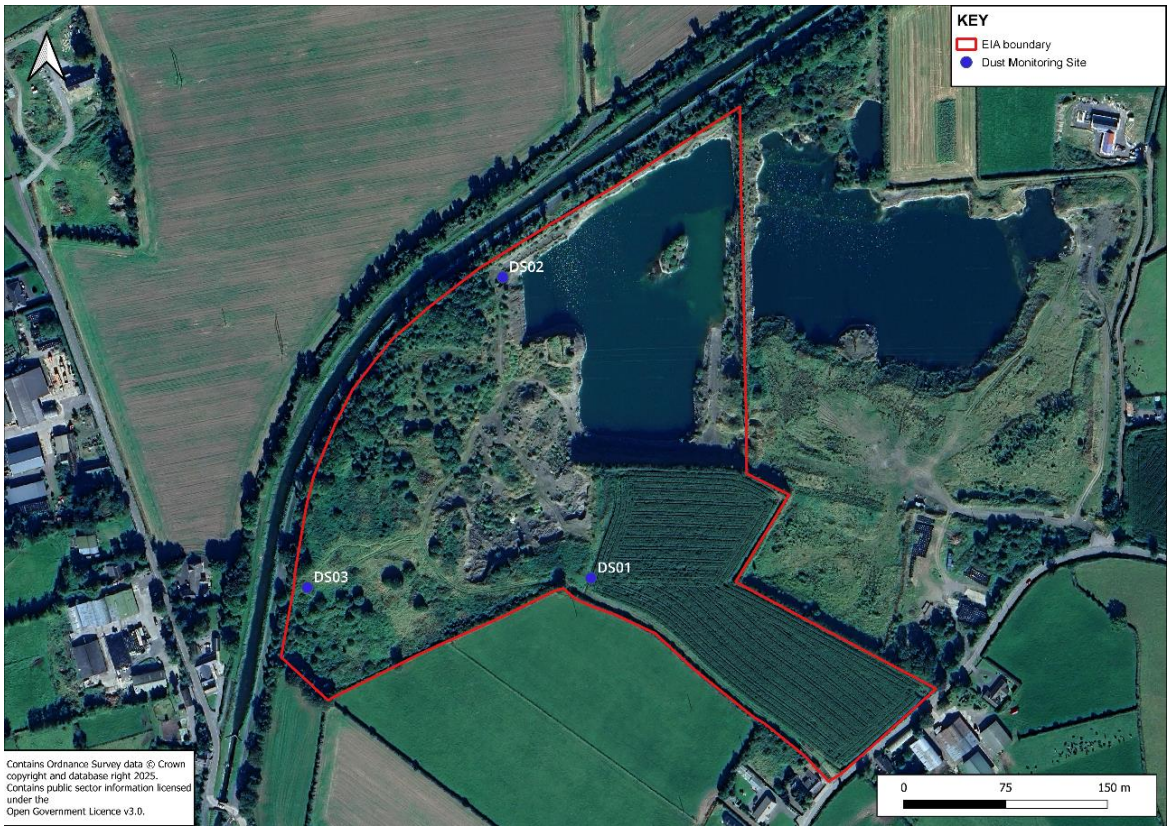


Figure 7-4 - Dust Monitoring Locations

As noted in Section 7.2.1.1, the EPA recommend a boundary dust deposition limit value of 350 mg/m^2/day measured using the Bergerhoff method, the monitoring results are summarised in Table 7-13.

Table 7-13: Recorded Boundary Deposited Dust (mg/m^2/day)

Monitoring Period		Recorded Boundary Deposited Dust (mg/m^2/day)		
Start Date	**End Date**	**DS01**	**DS02**	**DS03**
24-05-2024	24-06-2024	**700**	80	118
24-06-2024	25-07-2024	118	188	**441**
25-07-2024	23-08-2024	23	20	28
Average		**280.3**	**96.0**	**195.7**

Notes:

Monitoring data provided by the BHP laboratories.

The number precision report is based on the data reported by analyst in the accompanying reports.

Bold text denotes boundary dust deposition levels above **350** mg/m^2/day.

Based on the data presented in Table 7-13, there were two instances (at different monitoring locations) when the monitored dust concentration exceeded 350mg/m^2/day and seven samples remained within the limit. One of the exceedances occurred during the May–June sampling period at monitoring location DS01. The second exceedance was recorded during the June–July sampling period at monitoring location DS03. The exceedances and high dust concentrations during the first two months of monitoring are believed to be due to local agricultural activities in the surrounding fields at the time of monitoring.

7.4.4.2 Secondary Data - EPA Monitoring

A review of publicly available information published by the Irish EPA indicates that background monitoring has historically been undertaken at three locations in Kildare, Celbridge, Naas and Newbridge. None of these are currently active and none are located within the 2km baseline study area.

The most recent monitoring was undertaken at Celbridge in County Kildare approximately 17km north from the Proposed Project, although monitoring ceased in 2011. The last reported data from the EPA ambient air monitoring station at Celbridge was undertaken between the 12 July 2010 and 10 April 2011 and is summarised in Table 7-14, no $PM_{2.5}$ monitoring was undertaken at this location.

Table 7-14 - Air Quality Monitoring Data for Celbridge (2010-2011)

Pollutant	Averaging Period	Mass Concentration (µg/m^3)
NO_2	Average	13.5
	99.7%ile of hourly values	79.3
PM_{10}	Average	19.5
	90.4%ile daily average*	37.3
Note: *The 90.4%ile of PM_{10} daily mean concentrations is the 36th highest value in a series of PM_{10} daily mean concentrations; it is related to the PM_{10} daily limit value, which allows for 35 exceedances of the 50µg/m^3 threshold in a year.		

In the absence of local background data, the most recent annual mean NO_2, PM_{10} and $PM_{2.5}$ monitoring data from other stations within the EPA National Ambient Air Quality Monitoring Network located in Zone D areas across Ireland are detailed in Table 7-15. There are also monitoring stations located in Naas and Newbridge, but these have been omitted as they are in Zone B locations.

Table 7-15 - Annual Mean Monitoring Data for Zone D Stations (2023)

Monitoring Location	Annual Mean Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
Tipperary Town	ND	10.8	6.7
Shannon Estuary/Askeaton, Co. Limerick	ND	8.4	4.8
Carrick-on-Shannon	10.0	8.9	5.4
Enniscorthy	ND	13.3	9.0
Birr	11.3	13.1	8.3
Macroom	ND	11.3	7.3
Castlebar	6.6	9.9	ND
Cobh Carrignafoy	ND	11.8	6.8
Claremorris	ND	8.1	5.2
Kilkitt	1.7	7.1	ND

Monitoring Location	Annual Mean Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
Cavan	ND	10	6.4
Roscommon Town	ND	9.7	6.4
Edenderry	8.6	16.3	12.4
Mallow	ND	10.5	6.1
Longford	ND	13.1	9.2
Cobh Cork Harbour	ND	11.4	ND
Killarney, County. Kerry	ND	8.9	5.4
Malin Head	ND	12.8	6.8
Cork Glanmire Road	ND	ND	7.6
Shannon Estuary / Askeaton, County Limerick	ND	ND	4.8
Emo Court Co. Laois	2.3	ND	ND
Briarhill	16.1	ND	ND
Note: ND denotes no data.			

All monitored concentrations in 2023 are below the relevant standards for NO_2, PM_{10} and $PM_{2.5}$ given in Table 7-1.Taking a conservative approach, and assuming no reduction in emissions of these pollutants in the future, levels of all pollutants would remain below the relevant standards.

7.4.5 Receptors

Sensitive locations are places where the public or sensitive ecological habitats may be exposed to pollutants resulting from activities associated with the Proposed Project. These will include locations sensitive to increases in dust deposition and PM_{10} exposure resulting from mineral dust and trackout, and gaseous pollutants from operational emissions due to plant and NRMM. An assessment is undertaken where there are sensitive receptors within the study areas defined in Section 7.1.2.

7.4.5.1 Sensitive Human Receptors

In terms of locations that are sensitive to dust and air pollutants, these will include places, such as residential properties, where members of the public are likely to be regularly

present over the period of time prescribed in Table 7-1. For instance, on a footpath where exposure will be transient (for the duration of passage along that path) comparison with a short-term standard, i.e., 1-hour mean, may be relevant. At a school or adjacent to a private dwelling, where exposure may be for longer periods, comparison with a long-term standard (such as the 24-hour or annual mean) may be more appropriate.

For the study area, this includes residential receptors, categorised as high-sensitivity receptors, located along roads L1002 and L7049. Barrow line canal towpath is considered to be a medium sensitive receptor due to its valuable cultural and heritage use as an amenity for walkers and cyclists.

7.4.5.2 Sensitive Ecological Receptors

The IAQM guidance defines the types of sensitive ecological receptors to be considered in the assessment.

Table 7-16 - Ecological Receptor Sensitivity and Types

Receptor Sensitivity	Types of Ecological Receptors
High	Locations with an international designation, e.g., a Ramsar site, where the designated features may be affected by dust soiling. Locations where there is a community of a dust sensitive species such as vascular plants. Indicative examples include SAC designated for acid heathlands adjacent to a source of alkaline dusts.
Medium	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. Nationally designated site and the designated features may be affected by dust deposition, indicative examples include SSSIs or local wildlife sites with very specific sensitivities.
Low	Locations with a local designation where the features may be affected by dust deposition. An indicative example is a local Nature Reserve with dust sensitive features.

The nearest ecological site is the Grand Canal proposed Natural Heritage Area (pNHA) which is located just beyond the northern boundary of the EIA Boundary. This is considered to be a medium sensitive receptor under the IAQM guidance as it serves to provide functional connectivity for otters, salmon and Twaite Shad which are a designated feature of the River Barrow and River Nore SAC[2]. The River Barrow and River Nore SAC and all other identified designated sites are located outside the 400 m Study Area for the

[2] See Chapter 4 of this EIAR (Ecology and Biodiversity) for details.

assessment and are therefore not considered further as any impacts are predicted to be not significant.

7.5 Characteristics of the Proposed Project

Chapter 2 Project Description provides detailed information on the activities associated with the Proposed Project including the following Construction Phase activities.

- Key activities: Site clearance, topsoil stripping, infilling, and installation of site facilities;
- Plant used (type and number);
- Inherent mitigation measures;
- Operational hours; and
- Stockpile locations and haul routes.

7.6 Potential Effects

7.6.1 Sources

The following section sets out sources in the context of the quarry restoration activities carried out within the Application Site and the plant used to facilitate this.

7.6.1.1 Mineral Dust

Based on the activities detailed in Chapter 2 Project Description, it is anticipated that dust generating activities, associated with quarry restoration, will influence the air quality in Site vicinity during the operation of the Proposed Project. These are expected to include:

- Handling of clean soil and stone: Loading, unloading, and movement of clean soil and stone;
- Haulage, where the weight of vehicles, their speed of passage and number of wheels in contact with the ground, and the nature and condition of road surfaces or haul routes affect the amount of dust emitted;
- Site preparation and grading: Earthworks like levelling or spreading materials can release particulates; and
- Wind erosion from exposed surfaces or stockpiles: Uncovered materials or bare soil can contribute to fugitive dust.

The activities / sources within the Proposed Project have been assessed using the methodology outlined in Section 7.3 to identify the potential dust emission magnitude these are summarised below:

- It is anticipated that three items of loading plant, i.e., one bulldozer, one excavator and one tractor, would operate on-site for unloading/reloading of clean soils and stones during the construction phase of the Proposed Project. The material has low dust potential, and the majority of activities will take place within the quarry void with any temporary stockpiles placed over 50m from the site perimeter to manage potential off-site

dust impacts. The residual source emission for material handling is therefore classed as ‘medium’;

- Material will be transported across the Application Site via existing internal haul routes including unpaved roads and the private access road, which will be upgraded from aggregate to paved surface. It is estimated that there will be approximately 36 heavy-duty vehicle (HDV) movements per day along internal roads. On-site traffic will be limited to 10km/h to minimise dust generation. The residual source emission for on-site transportation is therefore classified as ‘large’’;
- Existing stripped topsoil and imported topsoil will be temporarily stockpiled on-site. It is not intended to stockpile clean soil and stone used for land raise onsite, however, this assessment considers the potential as a ‘worst case’ scenario where it may in exceptional periods be temporarily stockpiled on-site. Topsoil is fine-grained and often dry when stockpiled, with a high proportion of loose particles, giving it a high dust potential. Given the scale of stockpiling and the potential for dust emissions, the residual source emission for stockpiling is therefore classed as ‘medium’; and
- There will be approximately 18HDV outward movements on the site access road each day. The access road will be paved, and a vehicle wash-down area will be available for HDVs exiting the site. Considering these, the residual source emission for off-site transportation is classified as 'small'.

Table 7-17 provides a summary of the residual source emission determined for each activity considered.

Table 7-17 – Residual Source Emissions Classification

Activity	**Demolition**
Material Handling	Medium
On-Site Transportation	Large
Stockpile and Exposed Surface	Medium
Off- Site Transportation	Small

7.6.1.2 Trackout

The IAQM assessment methodology outlined in Section 7.3, has been used to determine the potential dust emission magnitude for the trackout.

All trucks will access the site via the L7049 from/to the east and the junction with the R414, Figure 7-5 illustrates trackout route. It is predicted due to the required works that there will be approximately 18HDV (>3.5t) outward movements in any one day. The private access

road is being upgraded with a paved surface. Therefore, the potential dust emission magnitude is Small for trackout.

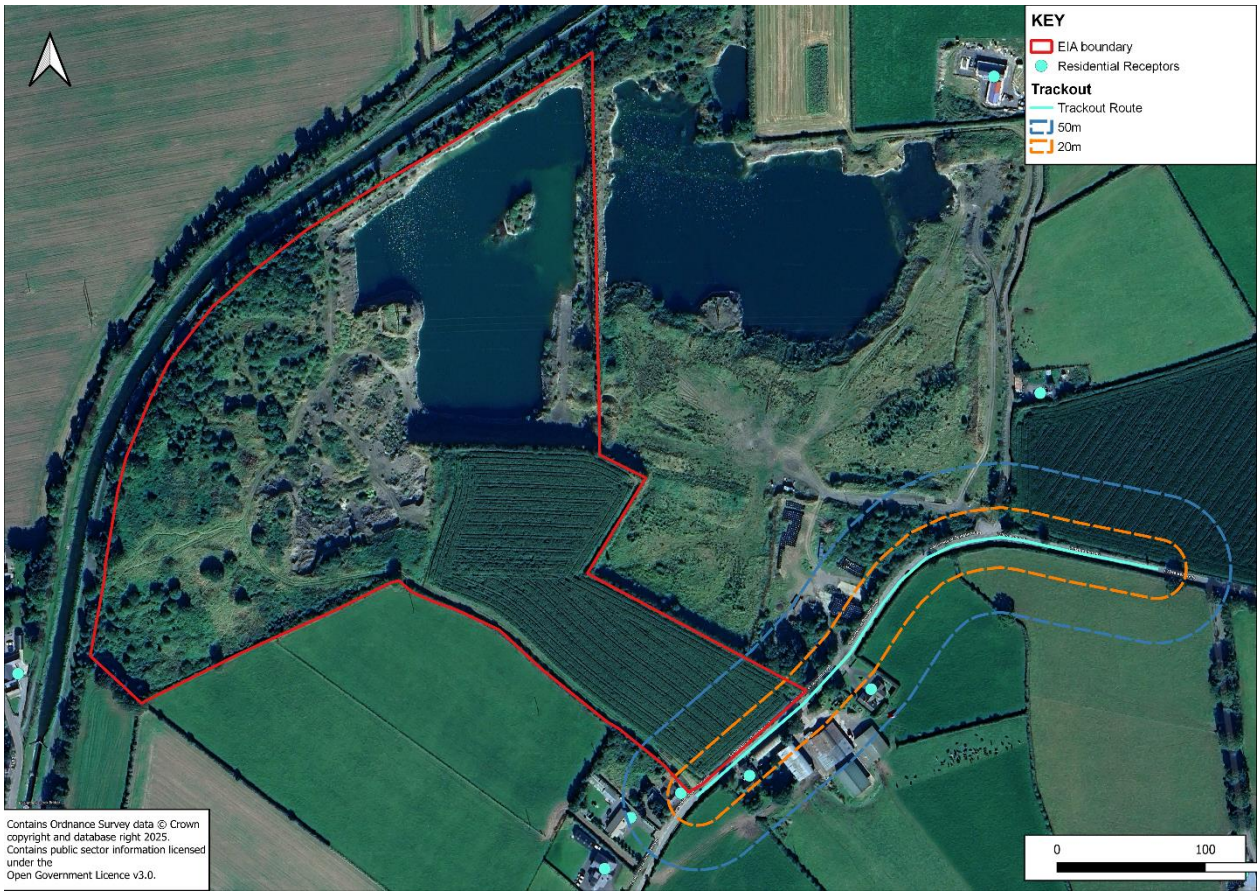


Figure 7-5 - Trackout dust assessment

7.6.1.3 Plant and Machinery Emissions

Emissions of oxides of nitrogen (NO_X) and particulate matter from site plant and NRMM have the potential to increase NO_2, PM_{10} and $PM_{2.5}$ concentrations at locations within 200m of the EIA boundary. As shown in Figure 7-6 there are 15 residential properties (where the air quality objectives apply) within 200m of the EIA boundary within the boundary that could be affected by plant and NRMM emissions.

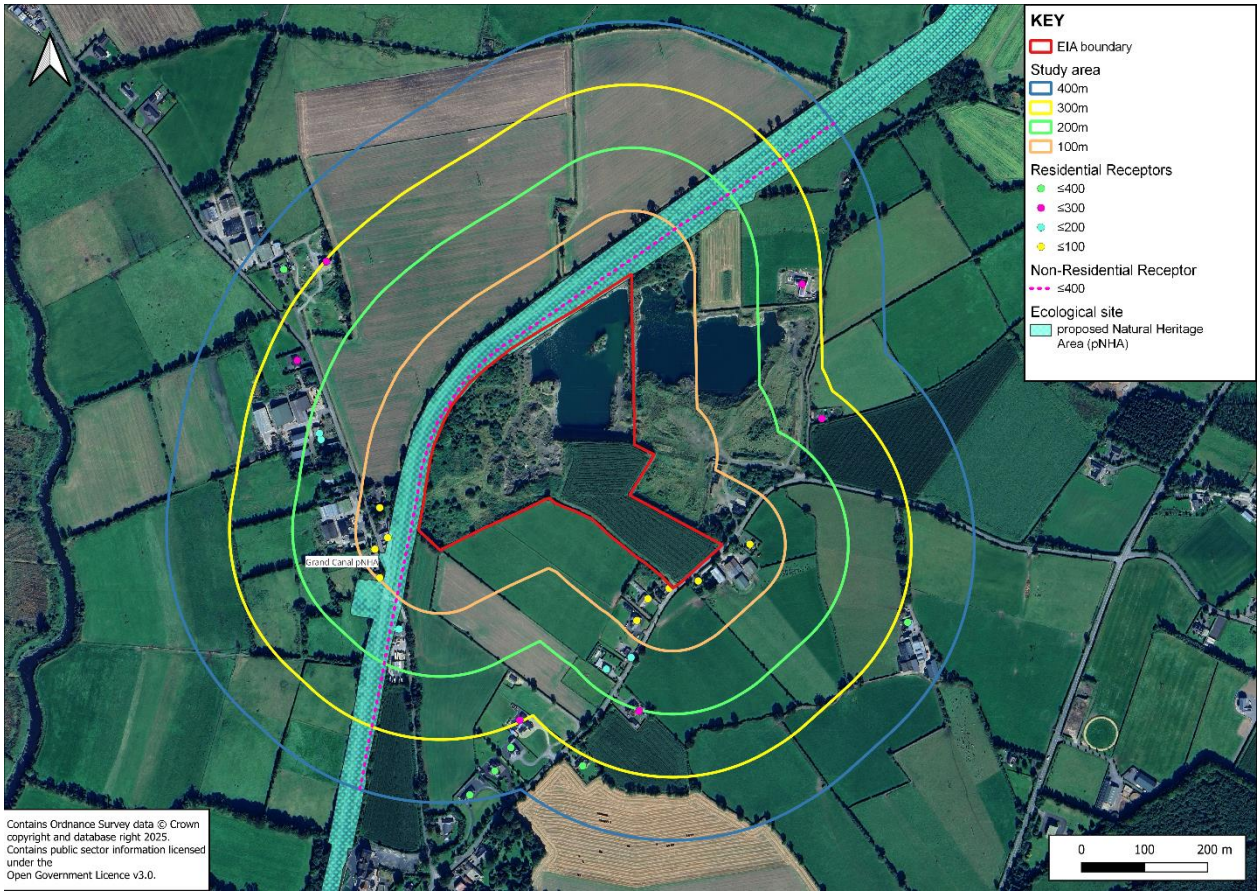


Figure 7-6 - Location of Receptors within the Assessment Study Areas

As noted in Chapter 2 Project Description, there will be up to 4 items of plant and NRMM operating on site during the Proposed Project. It is predicted that plant and NRMM requiring energy will operate using portable diesel-fired power generation and generators will also be used to power mobile lighting, if required.

Plant and NRMM are expected to be used during working hours only (as detailed in Chapter 2), so any emissions are expected to have been short-term and temporary (i.e., no longer than the working day: 07:30 hours and 18:00 hours, Monday to Friday and between 08:00 hours and 14:00 hours on Saturdays) in nature.

7.6.2 Site Parameters

The risks of potential dust emissions associated with the Proposed Project is largely determined by the local atmospheric conditions and the distance from the source to the receptor.

The conditions considered in the assessment include:

- Wind speed, to determine the likely occurrence of particles travelling beyond the Application Site boundary;

- Frequency of winds from the direction of the dust source to assess how often winds are likely to disperse dust towards sensitive receptors; and
- Wind direction, to identify the areas over which particles are likely to travel.

As detailed in Section 7.4.3, a representative Met Éireann station close to the Application Site is located at Casement Aerodrome approximately 45km northeast of the Application Site. Wind speed and wind direction are measured at the station and a wind-rose is presented in Figure 7-3 based on daily data from 01 January 2024 to 31 December 2024. Analysis of the data shows that the prevailing wind direction is from the southwest.

7.6.2.1 Mineral Dust Assessment

The receptors within 400m of the Application Site (shown in Figure 7-6) are given in Table 7-18. Residential receptors have been categorised as high sensitivity receptors and Non-residential receptors have also been categorised as medium sensitivity receptors.

Table 7-18 - Receptors within the Mineral Dust Study Area

Receptor Type and Distance Band	Number of Receptors in Group	Category of Receptor distance	Number of Receptors in Prevailing Wind Direction (NE of boundary or haul route)	Frequency of dusty winds	Pathway Effectiveness
Residential Properties					
≤100m	9	Close	0	Infrequent	Ineffective
≤200m	6	Intermediate	0	Infrequent	Ineffective
≤300m	6	Distant	2	Moderately frequent	Ineffective
≤400m	6	Distant	0	Infrequent	Ineffective
Non-Residential Locations					
≤100m	1	Considered intermediate due to the presence of vegetation berms reducing exposure to on-site sources	1	Moderately frequent	Moderately effective

Receptor Type and Distance Band	Number of Receptors in Group	Category of Receptor distance	Number of Receptors in Prevailing Wind Direction (NE of boundary or haul route)	Frequency of dusty winds	Pathway Effectiveness
Ecological Sites					
≤100m	1	Considered intermediate due to the presence of vegetation berms reducing exposure to on-site sources	1	Frequent	Moderately Effective

The category of receptor distance is defined based on the criteria in Table 7-3 of the methodology and the frequency of dusty winds is determined based on the criteria in Table 7-2 of the methodology. The receptor distance category and the frequency of dusty winds are then combined using Table 7-4 of the methodology to define the pathway effectiveness.

Assessment of the disamenity dust associated with the operation of the Proposed Project during the assessment period is summarised for each receptor in Table 7-19.

Table 7-19 - Assessment of Dust Disamenity Effects at Receptors

Receptor Type and Distance Band from Boundary	Maximum Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effects
Residential Properties					
≤100m	Large	Ineffective	Low Risk	High	Slight Adverse
≤200m	Large	Ineffective	Low Risk	High	Slight Adverse
≤300m	Large	Ineffective	Low Risk	High	Slight Adverse
≤400m	Large	Ineffective	Low Risk	High	Slight

Receptor Type and Distance Band from Boundary	Maximum Residual Source Emissions	Pathway Effectiveness	Dust Impact Risk	Receptor Sensitivity	Magnitude of Dust Effects
					Adverse
Non-Residential Properties/Locations					
≤100m	Large	Moderately Effective	Medium Risk	Medium	Slight Adverse
Ecological Sites					
≤100m	Large	Moderately Effective	Medium Risk	Medium	Slight adverse

Following the IAQM guidance, the nature of the Proposed Project, the magnitude of any deposited dust effects will be slight adverse at all human receptor locations but have the potential to be slight adverse at the Grand Canal pNHA due to its classification as having high sensitivity and frequency of winds. Further assessment of the sensitivity of this receptor is provided in Chapter 4 (Ecology and Biodiversity) of this EIAR.

7.6.2.2 Trackout

Assessment of Sensitivity of the Study Area

There are 3 highly sensitive residential receptors within 20m and 4 highly sensitive residential receptors within 50m of traffic routes up to 250m from the Application Site. These receptors include residential premises along the L7049. Hence, for trackout, the sensitivity of the area to dust soiling and human health impacts is classed as medium and low respectively.

Taking the above into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust, PM_{10} and $PM_{2.5}$ has been derived and the results are shown in Table 7-20.

Table 7-20 - Sensitivity of the Study Area

Potential Impact	Sensitivity of the Surrounding Area
Dust Soiling	Medium
Human Health	Low

The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the Proposed Project, prior to mitigation. Table 7-21 provides a summary of the risk of dust impacts for the Proposed Project. The risk category identified for trackout and has been used to determine the level of mitigation required.

Table 7-21 - Summary Dust Risk Table to Define Site Specific Mitigation

Potential Impact	Risk
Dust Soiling	Low Risk
Human Health	Negligible

The results of the trackout assessment indicate that there is a **Low risk** of impacts on dust soiling during operation of the Proposed Project and there is a **Negligible risk** of impacts to human health.

7.6.2.3 Plant and Machinery Emissions

Based on the current local air quality in the baseline study area (given in Section 7.1.2.1), the limited number and proximity of sensitive human receptors to the Application Site boundary, the predominant location of plant and NRMM emissions during construction phase, i.e., within the quarry void, the number and hours of operation, the impact of plant and NRMM emissions on local air quality is considered to be negligible and not significant.

7.7 Mitigation Measures and Monitoring

7.7.1 Mitigation Measures

Details of the mitigation measures that will be employed to reduce the impact of potential dust emissions from the Proposed Project on the surrounding area and the sensitive receptors identified for the duration of the assessment period are summarised below (further mitigation measures are also listed in Chapter 2 Project Description) and are consistent with the good practice mitigation measures given in the IAQM guidance:

- Dust monitoring will be undertaken at consistent monitoring locations on a routine basis;
- A water bowser will be used for dust suppression as required;
- On site speed restrictions (<10km/h) will be maintained to limit the generation of fugitive dust emissions;
- All HGVs exiting the Proposed Project will pass through a wheel-wash to minimise trackout;
- Stockpiles will be located away from the active infilling area and positioned to avoid any temporary adverse visual impact or dust nuisance; and
- Soil and stone materials will be brought to the Site in covered trucks to avoid the generation of windblown dust on the approach roads and within the Site.

In addition to the mitigation measures that will be employed, basic good practice mitigation measures given in the IAQM guidance are as follows:

MANAGEMENT

- A Dust Management Plan (DMP) to be agreed with the EHO and adhered to. A DMP provides a strategy to minimise the generation of dust and to control its release during the construction phase. At a minimum it should include the following
  - A description of the site and the surrounding area;
  - An assessment of the risks associated with dust due to construction activities;
  - Site-specific mitigation measures and a procedure for their implementation;
  - The roles and responsibilities of construction personnel;
  - Construction site and equipment layout;
  - Training requirements for site personnel;
  - A community engagement plan and complaints procedure, including standard reporting templates;
  - A dust monitoring plan; and
  - Operational requirements for on-road vehicles and NRMM.
- Effective site management practices are critical to demonstrate the willingness of the operator to control dust emissions and provides a mechanism for auditing of site operations. Such management procedures should be outlined within the DMP; and
- Record all dust and air quality complaints, identify causes, take appropriate measures to reduce emissions in a timely manner, and record the measures taken.

TRAINING

- Provide training to the site personnel on dust mitigation. Training should also cover ‘emergency preparedness plans’ to react quickly in case of any failure of the planned dust mitigation.

COMMUNICATION

- Maintain good communication to help alleviate anxieties between the operators and the surrounding communities. Set up regular, accessible liaison arrangements and providing information as freely as possible.

PLANNING OF ACTIVITIES

- Some activities should ideally be planned only during favourable weather conditions. Where possible, particularly dusty activities should be avoided during extended periods of dry and windy conditions.

VEHICLE MOVEMENTS

Site traffic is often the greatest source of dust on sites. Standard good practices for site haulage include:

- Avoiding abrupt changes in direction;
- Regular clearing, grading and maintenance of haul routes; and
- Evenly loading vehicles to avoid spillages.

MATERIAL HANDLING

- Minimize drop heights when unloading material to reduce dust generation;
- Regularly clear spillages to prevent the accumulation of loose dry material;
- Store fine materials under cover where possible or use wind barriers; and
- Spray exposed surfaces of stockpiles regularly to maintain surface moisture.

The determination of significance refers to the EPA Guidelines; **Table 7-22** assesses the potential impacts associated with the operation of the Proposed Project on dust and local air quality that have been considered for the assessment period with and without mitigation. The duration of these effects will have occurred in the medium term during the quarry's restoration.

Table 7-22 - Assessment of Impacts to Local Air Quality and Mitigation Measures Employed

Impact	With/ without mitigation	Type of Effect	Quality of Effects	Significance of Effects	Duration of Effects
Mineral dust and PM_{10} associated with the quarry restoration activities on sensitive human receptors	Without	Direct	Negative	Slight	M-T
	With	Direct	Negative	Imperceptible	M-T
Mineral dust and PM_{10} associated with the	Without	Direct	Negative	Slight	M-T

Impact	With/ without mitigation	Type of Effect	Quality of Effects	Significance of Effects	Duration of Effects
quarry restoration activities on ecological receptors	With	Direct	Negative	Imperceptible	M-T
Emission of Dust, PM_{10} and $PM_{2.5}$ from trackout	Without	Direct	Negative	Slight	M-T
	With	Direct	Negative	Imperceptible	M-T
Emissions of NO_X, PM_{10} and $PM_{2.5}$ from plant and NRMM	Without	Direct	Negative	Slight	M-T
	With	Direct	Negative	Imperceptible	M-T

Notes:

- Type of effect - direct and indirect.
- Quality of effects - positive; neutral and negative.
- Significance of effects - imperceptible; not significant; slight effects; moderate effects; significant effects; very significant; and profound effects.

Duration of effects - momentary effects (seconds to minutes); brief effects (less than a day); temporary effects (less than a year); short-term effects (1 to 7 years); medium-term effects (7 to 15 years); long-term effects (15 to 60 years); and permanent effects (lasting over 60 years).

Without mitigation measures it is considered that dust impacts from Proposed Project may not affect the character of an environment but would result in noticeable changes. Through the implementation of the existing site's environmental management programme, it has been demonstrated that the dust from various activities has an effect which causes noticeable changes in the character of the environment without affecting its sensitivity.

It should be noted, however, that once the project is complete, overall dust generation in the study area is expected to reduce due to the reduction in exposed ground and increased vegetation, resulting in less potential for wind generated dust.

7.7.2 Monitoring

A dust monitoring plan will need to be incorporated into the Dust Management Plan. It should cover the duration of the construction phase and will need to be agreed with the EHO in advance of the Project. A high-level summary of the required contents is provided below. This is to comprise daily visual inspections and boundary dust monitoring.

Daily visual inspections

Daily visual inspections are to be carried out by the operator during the construction phase. A log of all visual inspections is to be kept using the proforma given in 0 (or similar). This activity is to include inspection of:

- Paved areas within the site and in the vicinity of the site access to ensure that these are free of dirt and debris;

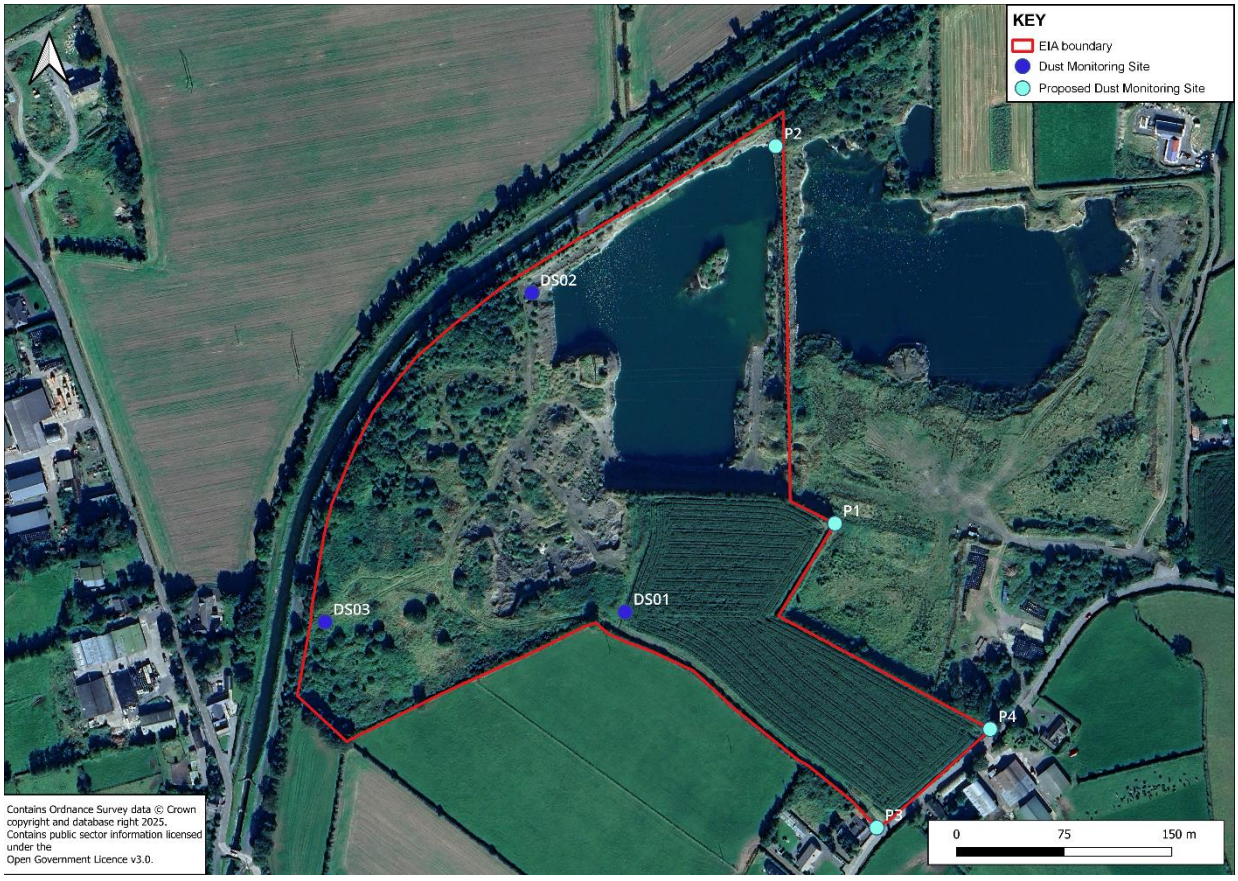
- Ongoing activities and dust control measures to ensure that measures are limiting visual dust emissions; and
- Exposed surfaces around the site (e.g., cars, windowsills etc) for evidence of dust soiling that could attributed to site activities.

Boundary dust monitoring

Dust monitoring was previously undertaken at the Application Site for a period of three months. Given the potential for Slight effects in the absence of mitigation, it is recommended that dust monitoring be continued during the construction phase to confirm the mitigation is working effectively. Monitoring should continue at the existing locations, with two additional monitoring points installed along the southwestern boundary, considering the predominant south-westerly wind direction. This setup will help capture both upwind and downwind dust deposition.

The current and proposed monitoring locations are shown in **Figure 7-7**. It is also recommended that the location of dust monitors be periodically reviewed throughout the operations of the Proposed Project to reflect the evolving nature of site activities.

Figure 7-7 - Proposed dust monitoring locations



The EPA recommend a boundary dust deposition limit value of 350 mg/m^2/day measured using the Bergerhoff method. In the event of the dust deposition limit being exceeded, the

exceedance is to be investigated through a review of on-going activities to identify the source and ensure appropriate remedial measures are implemented. Details of any exceedances, the cause and remedial measures taken should be documented in a site dust log (0).

Reporting

Monitoring data are to be collated on a monthly basis and a short summary report is to be produced. The monthly reports are to include the dust monitoring results, details of any exceedances and a summary of any remedial action taken to address on-site dust.

7.8 Residual Effects

With the application of the proposed mitigation measures, the residual effect of mineral dust and PM_{10} on sensitive human receptors is predicted to be imperceptible (i.e., negligible) and **unlikely to lead to a significant effect**. The proposed future monitoring activities will confirm this effectiveness.

Likewise, the impact of emissions of dust, PM_{10} and $PM_{2.5}$ from trackout and NO_X, PM_{10} and $PM_{2.5}$ from NRMM plant is expected to be imperceptible (negligible) and unlikely to lead to a significant effect.

7.9 Cumulative Effects

There are no existing industrial activities in the immediate surrounding area although surrounding agricultural activities may periodically generate dust due to farming activities.

The mitigation measures outlined in Section 7.7, provide sufficient mitigation for the Proposed Project against significant effects for human receptors.

As a result, cumulative effects are considered to be **Not Significant.**

7.10 Difficulties Encountered

Where suitable information was not available, professional judgement has been used in the completion of the assessment.

7.11 References

European Union (2014). Directive 2014/52/EU of the European Parliament and of the Council (amending Directive 2011/92/EU) [online]. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32014L0052& [Accessed May 2025].

Institute of Air Quality Management (2016). Guidance On The Assessment of Mineral Dust for Planning (version 1.1) [online]. Available at: https://iaqm.co.uk/text/guidance/mineralsguidance_ 2016.pdf [Accessed May 2025].

Institute of Air Quality Management (2024). Guidance on the Assessment of Dust from Demolition and Construction (version 2.2) [online]. Available at: https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-Dust-Guidance-Jan-2024.pdf [Accessed May 2025].

Environmental Protection UK / Institute of Air Quality Management (2017). Land-Use Planning & Development Control: Planning for Air Quality (version 1.2) [online]. Available at: https://iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf [Accessed May 2025].

Environmental Protection Agency (2006). Environmental Management in the Extractive Industries [online]. Available at: https://www.epa.ie/publications/licensing--permitting/industrial/ied/EPA_management_extractive_industry.pdf [Accessed May 2025].

The European Union (EU). Council Directive 96/62/EC of 27 September 1996 on ambient air quality assessment and management [online]. Available at: https://eur-lex.europa.eu/legal-content/en/ALL/?uri=CELEX%3A31996L0062 [Accessed March 2025].

European Union (1999). The First Daughter Directive (1999/30/EC) [online]. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L:1999:163:FULL [Accessed May 2025].

European Union (2008). Directive 2008/50/EC of the European Parliament and of the Council [online]. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0050 [Accessed May 2025].

Air Pollution Act (1987) [online]. Available at: https://www.irishstatutebook.ie/eli/1987/act/6 [Accessed May 2025].

SI 18/2011 Air Quality Standards Regulations (2011) [online]. Available at: https://www.irishstatutebook.ie/eli/2011/si/180/made/en/print [Accessed May 2025].

SI No. 349/1989 - European Communities (Environmental Impact Assessment) Regulations (1989) [online]. Available at: https://www.irishstatutebook.ie/eli/1989/si/349/made/en/print#:~:text=%E2%80%94(1)%20A%20relevant%20application,shall%20be%20accompanied%20by%20a [Accessed May 2025].

Planning and Development Act (2000) [online]. Available at: https://www.irishstatutebook.ie/eli/2000/act/30/enacted/en/print [Accessed May 2025].

SI 296/2018 - European Union (Planning and Development) (Environmental Impact Assessment) Regulations (2018) [online]. Available at: https://www.irishstatutebook.ie/eli/2018/si/296/made/en/print [Accessed May 2025].

Planning and Development Regulations (2001) [online]. Available at: https://www.irishstatutebook.ie/eli/2001/si/600/made/en/print [Accessed May 2025].

Mines and Quarries Act (1965) [online]. Available at: https://www.irishstatutebook.ie/eli/1965/act/7/enacted/en/html [Accessed May 2025].

Kildare County Council (2023). The Kildare County Development Plan 2023-2029 [online]. Available at: https://kildarecoco.ie/AllServices/Planning/DevelopmentPlans/KildareCountyDevelopmentPlan 2023-2029/AnnualMonitoringReports/CKCDP%20AMR%202023%20low%20res%20pdf.pdf [Accessed May 2025]

Environmental Protection Agency (2023). Air quality in Ireland 2023 [online]. Available at: https://www.epa.ie/publications/monitoring--assessment/air/air-quality-in-ireland-2023.php [Accessed May 2025].

Health and Safety Authority (2008). Safe Quarry - Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations [online]. Available at: https://www.hsa.ie/eng/your_industry/quarrying/quarries_in_ireland/safe_quarry_guidance/#:~:text=The%20Safe%20Quarry%20Guidance%20assists,interests%20in%20the%20quarrying%20industry. [Accessed May 2025].

DeHLG (2004). Quarries and Ancillary Activities - Guidelines for Planning [online]. Available at: https://www.opr.ie/wp-content/uploads/2019/08/2004-Quarries-and-Ancillary-Activities.pdf [Accessed May 2025].

Environmental Protection Agency (2022). Guidelines on the Information to be Contained in Environmental Impact Assessment Reports [online]. Available at: https://www.epa.ie/publications/monitoring--assessment/assessment/EIAR_Guidelines_2022_Web.pdf [Accessed May 2025]

European Commission (2016). Climate Change and Major Projects [online]. Available at: https://climate.ec.europa.eu/system/files/2016-11/major_projects_en.pdf [Accessed May 2025

Defra (2012). Process Guidance Note 3/16 (12) - Statutory guidance for mobile crushing and screening [online]. Available at: https://assets.publishing.service.gov.uk/media/5a7f778a40f0b62305b87529/mobile-crushing-and-screening-process-guidance-note-3-16_12_.pdf [Accessed May 2025].

Environmental Protection Agency (2023). EPA Geoportal [online]. Available at: https://gis.epa.ie/EPAMaps/ [Accessed May 2025].

Environmental Protection Agency (2012). Report on Ambient Air Quality in Celbridge [online]. Available at: https://www.epa.ie/publications/monitoring--assessment/air/ambient-air-monitoring/report-on-ambient-air-quality-in-celbridge.php [Accessed May 2025].

Appendix 7A

DUST LOG REPORT FORM

Dust Log					
Date **Site** **Name**	**Weather**	Dry		Wet	
	Wind Direction (from)	N	S	E	W
		NE	NW	SE	SW
	Wind Speed	Calm	Low	Moderate	High

Daily Site Activities
This section should outline the planned daily activities on the site for the day.

Incidents/Complaints/Alerts
Record details of the incident/complaint/alert, to whom and how it was reported and what time. What was the cause of the incident/complaint/alert and where did it take place? Add detail to Dust Complaint Form.

Action Undertaken
Who undertook the site inspection, at what time and was the elevated dust due to site activities or off-site activities? What was done to minimise the dust levels and was this effective?

Follow-Up Action
Where there any follow up actions undertaken such as informing stakeholders, re-training staff, request for an updated to the DMP or contacting the complainant if necessary?