7

AIR QUALITY

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7.1 INTRODUCTION

This remedial Environmental Impact Assessment Report [rEIAR] has been prepared to accompany a substitute consent application for an existing quarry at Philipstown and Red Bog, Co. Kildare. The Development is located within the administrative boundary of Kildare County Council, (KCC).

This chapter of the rEIAR has been prepared by WSP Ireland Consulting Ltd (WSP) and assesses the potential air quality impacts associated with the Development during the assessment period, (September 2020 to present).

The following assessment was prepared by Rachel Lansley (BSc, MSc), and Sophie Winters (BSc). Rachel is a Chartered Scientist (CSci), a Member of the Institution of Environmental Sciences (IES), and a Member of the Institute of Air Quality Management (IAQM) and has more than 15 years' experience in air quality assessment. Sophie is a Member of the Institute of Environmental Management and Assessment (IEMA) and has more than 5 years' experience in air quality assessment.

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 Project on the environment resulting from the emission of pollutants to air is provided. Given the retrospective nature of this rEIAR, the scope of this section is a review of monitoring records of operations that occurred at the Development from September 2020 to the present.

For quarry related activities, the most likely emission to the air environment is deposited dust, which arises predominantly from the excavation, processing and transport of materials. These sources are generally dispersed sources rather than specific point sources and this dictates the measures required to mitigate dust related impacts.

A qualitative assessment of dust impacts from the quarrying activities has been undertaken in line with Institute of Air Quality Management (IAQM); Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016.

A traffic screening assessment of effects from road traffic emissions has been undertaken in accordance with the UK Design Manual for Roads and Bridges (DMRB, 2020) and Environmental Protection UK/Institute of Air Quality Management guidance document 'Land –Use Planning & Development Control: Planning for Air Quality' (EPUK/IAQM 2017).

7.1.2 GEOGRAPHICAL AND TEMPORAL SCOPE

The geographical study area for the assessment covers the EIA site boundary (Site) (identified on Figure 7-1) and a buffer zone of 500 m from the EIA boundary (i.e. the study area), as it has been found that deposited dust does not generally travel beyond 400 m (IAQM, Appendix 2, 2016). This area includes the receptors with the potential to be impacted by quarry operations.

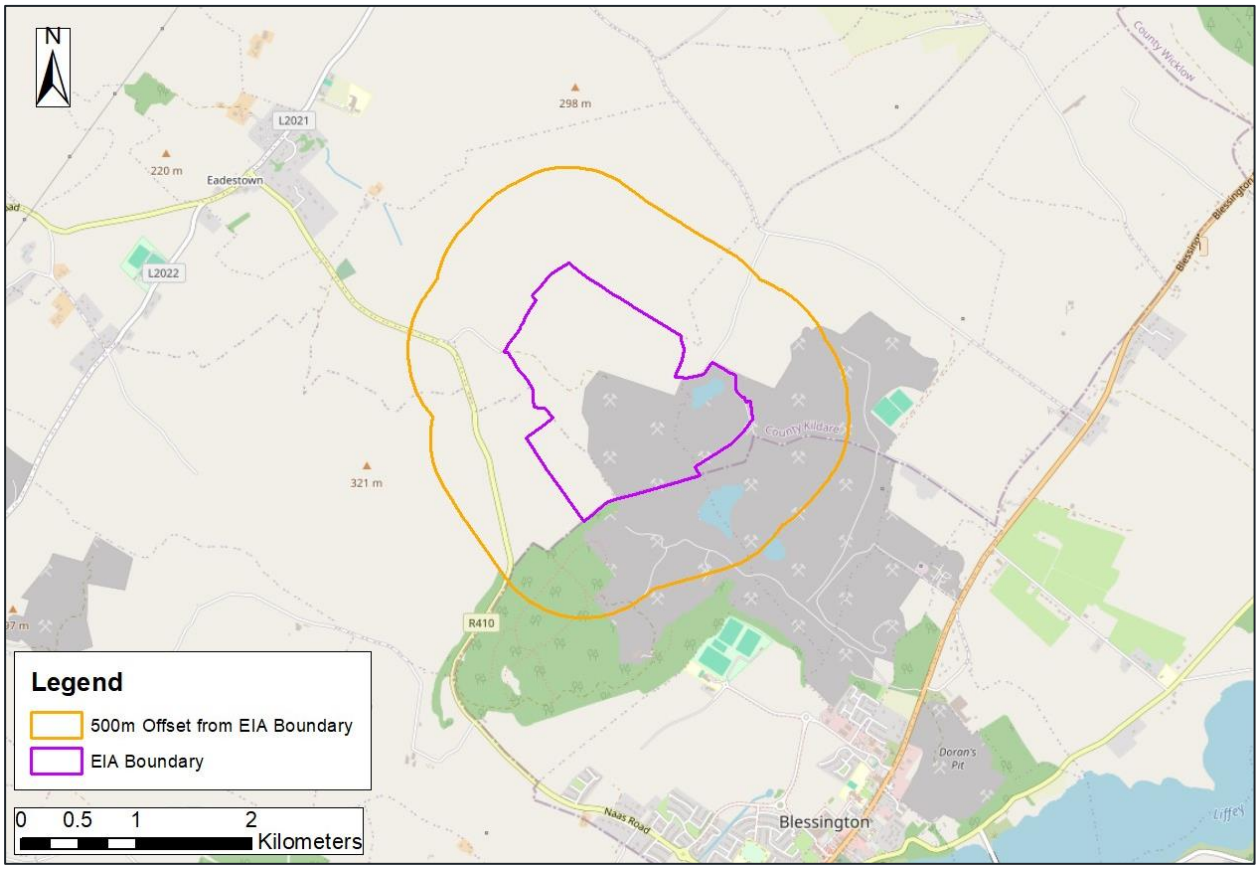


Figure 7-1 – EIA Site Boundary and 500m Offset

In the context of the rEIAR, the Site boundary contains lands which form the existing quarry site and some areas which extend beyond the working areas. The substitute consent (the Planning Application) boundary is shown on the drawing set which accompanies the planning application.

The baseline for this rEIAR has been set to September 2020, and the rEIAR process has assessed environmental impacts from that date to the present. This assessment period equates to approximately three and a half years and is identified as 'short-term' duration (those lasting one to seven years).

7.2 LEGISLATIVE AND POLICY CONTEXT

7.2.1 RELEVANT POLICIES AND PLANS

The Kildare County Development Plan 2023-2029 (KCDP) is the key strategy document which structures the proper planning and sustainable development of land-use across County Kildare over the six-year statutory time period of the plan. The KCDP seeks to ensure that proposals in the county take account of the need to prevent major accidents involving hazardous substances and safeguard the public, property and the environment.

The KCDP acknowledges the potential environmental effects of the aggregate industry and importance of protecting surrounding residential and natural amenities. The KCDP also identifies that gravel resources are important to the general economy and provide a valuable source of employment in some areas of the county. 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

KCDP identifies that planning policies should be carefully constructed to avoid adverse effects on aggregate resources and related extractive industries. The KCDP 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 has adopted policies and objectives within the development plan in relation to the protection of environs from adverse environmental impact from extractive industry.

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

7.2.2 RELEVANT GUIDANCE

This assessment has been undertaken with guidance from the Environmental Protection Agency's (EPA) 'Guidelines on the Information to be Contained in Environmental Impact Assessment Reports', (May 2022). Other guidance documents considered in this assessment include:

- IAQM; Guidance on the Assessment of Mineral Dust Impacts for Planning, 2016;
- EPA; Guideline Document entitled Environmental Management in the Extractive Industries, 2006;
- EPUK; Land-Use Planning and Development Control: Planning for Air Quality, 2017;
- European Commission; Climate Change and Major Projects, 2016;
- Quarries and Ancillary Activities – Guidelines for Planning Authorities – DOEHLG, April 2004;
- Process Guidance Note 3/16 (12) – Secretary of State's Guidance for Mobile Crushing and Screening, DEFRA (UK), June 2012;
- Process Guidance Note 3/08 (12) – Secretary of State's Guidance for Quarry Processes, DEFRA (UK), September 2012;
- Safe Quarry – Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008 – Health and Safety Authority, 2008; and
- Environmental Protection Agency's Annual Air Quality in Ireland Report 2022.

7.2.3 RELEVANT LEGISLATION & AIR QUALITY STANDARDS

7.2.3.1 Coarse Particulates

The impact of dust is usually monitored by measuring rates of dust deposition. According to the EPA Guideline Document entitled Environmental Management in the Extractive Industries (April, 2006), there are currently no Irish statutory standards or EPA guidelines relating specifically to dust deposition thresholds for inert mineral dust. There are a number of methods to measure dust deposition but only the German TA Luft Air Quality Standards (TA Luft, 1986) specify a method of measuring dust deposition – the Bergerhoff Method (German Standard VDI 2119, 1972) – with dust nuisance.

On this basis, the EPA recommend a dust deposition limit value of 350 mg/m^2/day (Table 7-1) (when averaged over a 30-day period, +/- two days) be adopted at site boundaries associated with quarrying related activities.

Table 7-1 – Dust Limit Value

Procedures	Monitoring Frequency	Standard
Dust Emissions	Monthly	<350 mg/m^2/day;

7.2.3.2 Fine Particulates

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 (CAFE) 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.

The 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 EPA monitor the levels of various pollutants against the standards set out in EU and Irish legislation. The EPA are 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 an assessment purposes. Highly populated areas are classified as Zone A, with sparsely populated areas as Zone D. The Site is located within a designated Zone D for air quality (EPA maps, 2023 - https://gis.epa.ie/EPAMaps/).

The air quality standard (AQS) for PM_{10} and $PM_{2.5}$ are detailed in Table 7-2 below.

Table 7-2 – Fine particulate (PM_{10} and $PM_{2.5}$) Air Quality Standards

Procedures	Averaging Period	Standard
PM_{10}	Annual	25
	24-hour	50 (not to be exceeded more than 35 times a year)
$PM_{2.5}$	Annual Stage 1)	25
	Annual (Stage 2)	20

7.2.4 OTHER RELEVANT LEGISLATION

Legislative references considered specifically for the assessment of air quality and climate from quarrying activities, and relevant statutory instruments in a planning context include:

- European Communities (Environmental Impact Assessment Regulations) 1989 (S.I. No. 349 of 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, S.I. 296 of 2018; and
- Planning and Development Regulations 2001 (as amended).

Relevant statutory instruments in the context of quarrying include:

- Mines and Quarry Act 1965, 7 of 1965.

Legislative references considered specifically for the assessment of air quality and climate from combustion emissions include:

- Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011)

7.3 SOURCES OF EMISSIONS TO AIR

7.3.1 PARTICULATES

The main potential impact on ambient air quality associated with extraction activities and aggregate processing is that associated with deposition of dust generated by the rock extraction and material transfer operations.

Potential dust emissions associated with quarry workings are:

- Mechanical handling operations, including crushing and grading processes where in general the more powerful the machinery and the greater the volumes of material handled the greater the potential for dust emission;
- 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:
- Loading and movement of overburden to dump areas;
- Blasting and rock breaking;
- Wind blow from paved areas, material stockpiles, unsurfaced internal haul roads and quarry floors; and
- Import of soils for quarry restoration including transport and void filling.

7.3.2 TRAFFIC EMISSIONS

Traffic data for the Site during the assessment period indicates that there have consistently been around 148 HDV (Heavy Duty Vehicle) round trips per day during weekdays, and around 74 HDV round trips on working Saturdays.

These values are consistent with those recorded during the quarry operations prior to September 2020, so no changes in HDV AADT (Annual Average Daily Traffic) were observed. The UK Design Manual for Roads and Bridges (DMRB) specifies a HDV screening criteria of a change of 200 AADT, and the IAQM Land Use Planning Control: Planning for Air Quality (2017_ specifies a HDV screening criteria of 100 AADT. Considering that there has been no change in traffic flows associated with the operation of the site during the assessment period compared to previous operations, no detailed assessment is required and therefore traffic emissions have been screened out of this assessment as Not Significant.

7.3.3 ODOUR

Inert materials have been excavated from the Site during the assessment period, which are not odorous. Therefore, odour emissions from the operation of the Site during the assessment period are considered Not Significant.

7.3.4 COMBUSTION EMISSIONS

No combustion emissions or point source emissions to air are part of the operations of the site during the assessment period, and have therefore been screened out of this assessment as Not Significant.

7.4 ASSESSMENT METHODOLOGY AND SIGNIFICANCE CRITERIA

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

The residual source emissions are characterised based on the scale of the operations and the Site activities and are classified as either small, medium or large. Guidance on the appropriate scale of the residual source is provided in the IAQM guidance, Appendix 4 (2016). This source characterisation includes consideration of the routine management and mitigation measures which have been undertaken at the Site.

The pathway from the source to the receptor is assessed considering the distance and direction of receptors to the source relative to the prevailing wind and local meteorology. The local meteorological data is also used to assess the frequency of the winds in each direction. It has been found that deposited dust does not generally travel beyond 400 m (IAQM, Appendix 2, 2016), therefore all receptors within 500 m of the Site boundary are considered. The guidance states that it is commonly accepted that the greatest impacts will occur within 100 m of the source, with the potential for travel up to 400 m.

For full consideration of the effects of the access road, in the absence of any methodology within the IAQM minerals guidance, the IAQM Guidance on the Assessment of Dust from Demolition and Construction (2016) has been considered. This guidance states that human receptors within 50 m of the routes used by vehicles for 350 m from the Site exit point should be considered. For this reason, the haul road will be subject to a 50 m buffer, which will then extend 350 m out onto the N81

main road to account for the possibility of trackout from exiting vehicles. For conservatism, a 350 m length buffer has been applied from the point at which the Site exits onto the N81 public road.

The criteria for the categorisation of the frequency of potentially dusty winds (Table 7-3) and the receptor distance from source (Table 7-4) is used to define the pathway effectiveness (Table 7-5).

The residual source emissions and the pathway effectiveness are combined to predict the Dust Impact Risk as shown in Table 7-6.

Table 7-3 - Categorisation of Potentially Dusty Winds

Pathway Effectiveness	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 7-4 - Categorisation of Receptor Distance from Source

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

Table 7-5 – 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 7-6 – Estimation of Dust Impact Risk

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

The final step is to assess the likely magnitude of the dust effects since September 2020 (Table 7-7). 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 7-7 – 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
	Low Risk	Negligible Effect	Negligible Effect	Slight Adverse Effect
	Negligible Risk	Negligible Effect	Negligible Effect	Negligible Effect

7.5 BASELINE AND SUBSEQUENT CONDITIONS (2020 TO PRESENT)

7.5.1 THE SITE AND SURROUNDS

Since September 2020, the development use has been for the quarrying and production of sand, gravel and rock located in Co. Kildare.

The Site is located adjacent to the border with Co. Wicklow and approximately 2 km northwest of Blessington, Co. Wicklow.

The lands surrounding the Site can be characterised as rural in nature with low-density housing, and more concentrated residential housing in the town of Blessington. There are other quarry operations located immediately to the south and east of the Site which have also been operational during the assessment period. Further south, there is another quarry also operated by the applicant. The other Site owned by the Applicant contains the weighbridge which vehicles from the Application Site use prior to exit onto the N81 public road.

The quarry was first developed in the 1950s and has been operation since.

The EIA study boundary is detailed in Figure 7-1 earlier in this report.

7.5.2 STUDY AREA

It has been found that deposited dust does not generally travel beyond 400 m (IAQM, Appendix 2, 2016), therefore all receptors within 500 m of the Site boundary are considered. The guidance states that it is commonly accepted that the greatest impacts from particulates will occur within 100 m of the source, with the potential for travel up to 400 m.

For full consideration of the effects of particulates on the access road, in the absence of any methodology within the IAQM minerals guidance, the IAQM Guidance on the Assessment of Dust from Demolition and Construction (2016) has been considered. This guidance states that human receptors within 50 m of the routes used by vehicles for 350 m from the Site exit point should be considered. For this reason, the haul road has been subject to a 50 m buffer, which then extends 350 m out onto the N81 main road to account for the possibility of trackout from exiting vehicles. A 350 m length buffer has been applied from the point at which the Site exits onto the N81 public road.

7.5.3 CLIMATE AT THE SITE

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

The closes Met Éireann station is located at Casement Aerodrome, Baldonnell, Co. Dublin, ca. 10 km north-northeast of the Site. Monthly data from September 2020 to present have been averaged and are presented in Table 7-8.

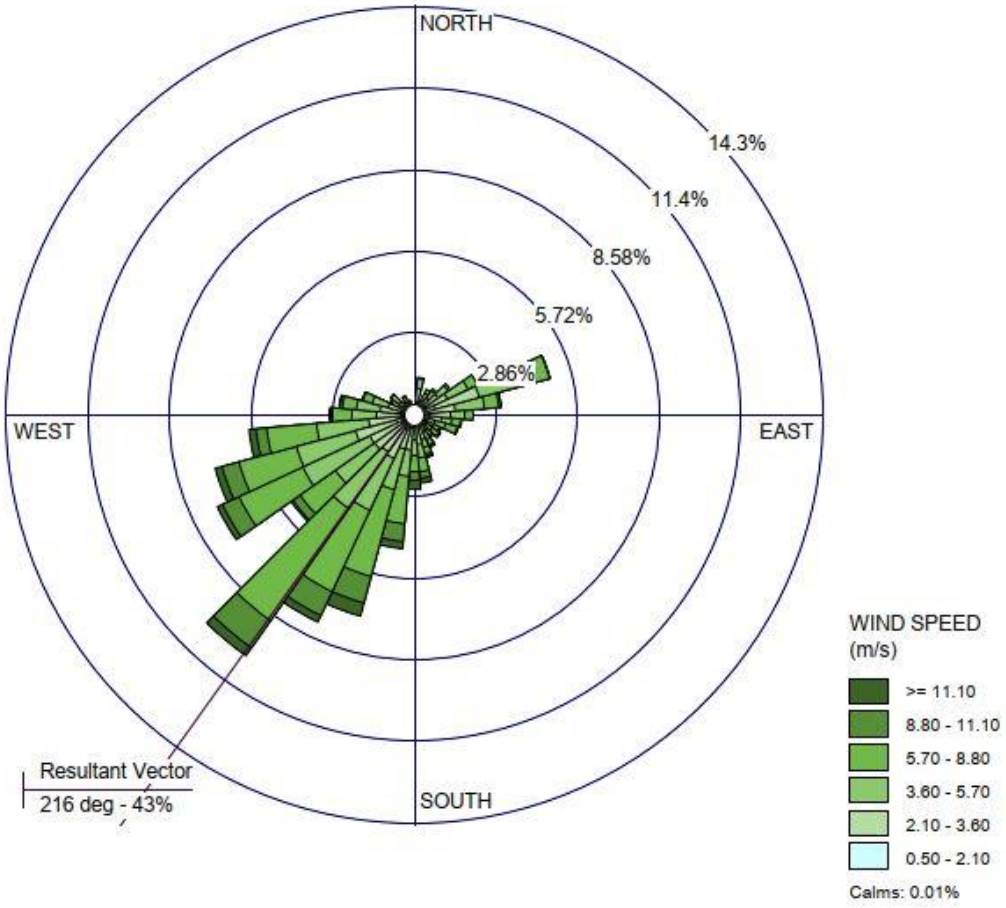
Table 7-8 – Casement, Co. Dublin Monthly Averaged Monthly Climate Information September 2020 to present.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Mean Air Temperature (°C)	5.0	6.7	7.4	7.9	11.4	14.7	16.3	15.7	14.0	11.2	8.0	5.1
Maximum Air Temperature (°C)	13.2	13.5	16.9	18.0	21.3	24.3	27.5	24.8	23.6	19.2	15.6	13.8
Minimum Air Temperature (°C)	-5.7	-1.7	-3.2	-3.2	1.1	5.3	7.7	6.9	2.7	2.0	-1.3	-4.0
Mean Maximum Temperature (°C)	8.0	9.6	11.2	12.4	16.1	19.1	20.5	20.0	18.0	14.5	11.0	7.9
Mean Minimum Temperature (°C)	2.1	3.7	3.6	3.5	6.8	10.3	12.1	11.3	9.9	7.8	5.0	2.2
Precipitation (mm)	56.3	61.6	59.7	44.0	65.5	47.0	86.2	50.2	80.5	93.9	42.0	82.2
Grass Minimum Temperature (°C)	-8.2	-5.2	-7.0	-7.3	-2.7	-0.1	3.1	4.0	0.3	-1.4	-5.0	-6.6
Mean Wind Speed (knots)	10.5	13.3	9.8	7.9	8.3	8.2	8.2	8.1	8.2	10.5	11.1	10.2
Highest Gust (knots)	46.3	50.3	46.3	39.0	38.0	33.0	34.3	41.7	42.5	44.3	49.5	50.0
Sunshine Duration (hours)	60.0	70.9	137.9	172.5	201.6	191.3	164.6	172.8	127.0	108.7	71.3	61.0

The information presented in Table 7-8 above provides an overview of the climatic conditions at the Site. Over the time period for which data is provided, the wettest months in terms of total rainfall for the period are July and October. High rainfall in these months provides natural dampening for potential dust emissions. The opposite impact occurs in dry and windy months, when there is increased potential for dust to be mobilised. The months with the highest mean wind speed are October to February and the driest months in the Site area are April, June and November.

An important meteorological parameter with regard to the dilution and dispersal of air pollutants is wind speed and direction. A full annual wind-rose for the Casement Aerodrome station is presented in Figure 7-2 for the period 01 January 2021 to 31 December 2022. The prevailing winds are from a south-westerly direction.

Figure 7-2 - Annual dominant wind direction at Casement Aerodrome using Hourly Wind Data (Assessment Period 1 January 2021 to 31 December 2022)



7.5.4 BACKGROUND AIR QUALITY

7.5.4.1 Primary Data – Site Monitoring Data

Dust monitoring has been undertaken at the site on a monthly basis from March 2019 to date using the Bergerhoff method, at a total of 10 locations which are described in Table 7-9 and shown on Figure 7-3 below.

Table 7-9 – Dust Monitoring Location Descriptions

Location	Description
D1K	Located in the northwest corner of the Site.
D2K	Located near the eastern boundary of the Site, adjacent to the main pit area.
D3K	Located near the eastern boundary of the Site and Site entrance.
D4K	Located near the southeastern boundary of the Site.
D5K	Located in the northern corner of the Site.
D6K	Located to the southwest of the Site, along the R410 (commissioned in August 2020 as baseline gathering and decommissioned in December 2022. No exceedances observed and not representative of emissions from the Applicant's quarry due to distance)
D7K	Located to the southwest of the Site, adjacent to the Glen Ding Woods (commissioned in August 2020 as baseline gathering and decommissioned in December 2022, as D2 was more representative and close to the Applicant's adjacent to the operational area)
D8K	Located to the east of the Site, adjacent to a residential dwelling beside the Applicant's haul route (commissioned in August 2020 as baseline gathering and decommissioned in December 2022 as not representative of the Applicant's quarry due to it's distance from the Site and proximity to another operator)
D9K	Located to the northeast of the Site boundary, north of the Red Bog SAC (commissioned in December 2022)
D10K	Located along northern boundary of the Site (commissioned in December 2022)

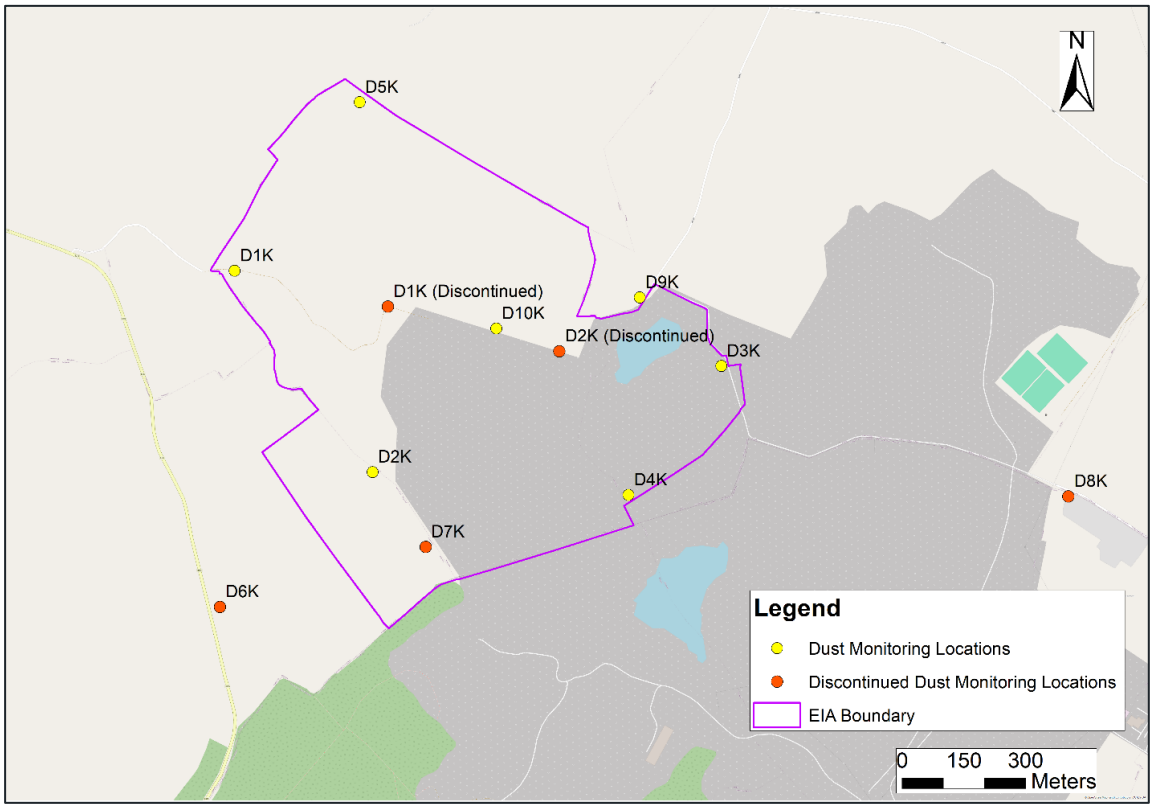


Figure 7-3 – Dust Monitoring Location Plan

The recommended dust deposition value when using the Bergerhoff method is 350 mg/m^2/day, as specified in Table 7-1 of this assessment. This value is recommended by the EPA in their guidance - Environmental Management in the Extractive Industries (April 2006).

Dust monitoring was undertaken on a monthly basis as locations D1K – D10K, with some monitoring locations being commissioned and/or decommissioned during the assessment period, as detailed in Table 7-9 above. The results of the monitoring are summarised in Table 7-10 and presented in Figure 7-4 below.

Table 7-10 – 2019 – 2023 Dust Deposition Monitoring Results

Dust Monitoring Location	Annual Dust Deposition Range (mg/m^2/day) per year of Monitoring				
	2019	2020	2021	2022	2023
D1K	27 – 10,114.4 (2 limit value breaches, 1 due to organic matter)	48 – 633 (2 limit value breaches, 1 due to organic matter)	48 – 380 (1 limit value breach)	85 – 759 (6 limit breaches, all 6 due to organic matter)	31 - 118
D2K	24 – 1,763.7 (3 limit value breaches, 2 due to organic matter)	47 – 633 (2 limit value breaches, 1 due to organic matter)	39 – 227	29 – 823 (1 limit breach, due to organic matter)	14 - 135
D3K	31 – 4,384 (2 limit value breaches, 1 due to organic matter)	25 – 464 (1 limit value breach)	42 – 431 (2 limit breaches)	68 – 698 (3 limit breaches, 2 due to organic matter)	10 - 150
D4K	39 - 335	61 – 371 (1 limit value breach)	51 – 694 (1 limit breach)	43 – 397 (3 limit breaches, 1 due to organic matter)	59 - 226
D5K	10 – 1,662 (1 limit value breach, due to organic matter)	39 – 394 (1 limit value breach)	17 – 1,125 (1 limit breach)	26 – 152	28 - 103
D6K		62 – 185	14 – 333	14 – 180	
D7K		62 – 432 (1 limit value breach)	46 – 326	32 – 419 (1 limit breach, due to organic matter)	
D8K		50 - 178	25 – 1,194 (3 limit breaches)	1 - 160	
D9K				91 (1 sample only)	36 - 213
D10K				193 (1 sample only	26 - 294

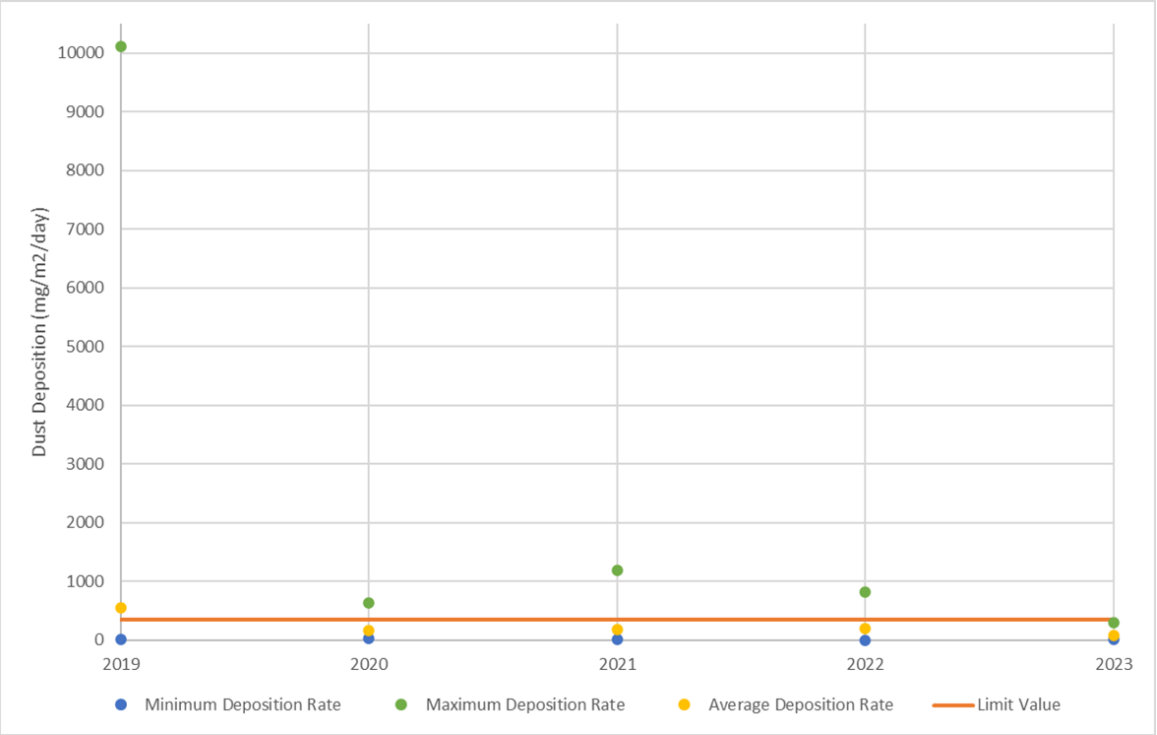


Figure 7-4 - 2019 – 2023 Dust Deposition Monitoring Results Summary Graph

Commentary on Concentrations Greater than the Limit Value

It should be noted that monitoring locations D1K and D2K were relocated in May 2019, both the discontinued and new locations are shown in Figure 7-3 above. High exceedances were experienced at both locations during the first month of monitoring (March – April 2019, D1K: 10,114.4 mg/m^2/day, D2K: 1,763.7 mg/m^2/day) due to poor positioning; D1K was located next to the main pit and main haul road, and D2K was located adjacent to the haul road. The sample obtained at D1K contained coarse sand particles, which is highly unlikely to be truly representative of the typical conditions at the Site. It is thought that a large wind event may have caused these exceedances, carrying coarse sand particles from the haul road into the sample jars due to their close proximity.

Many of the remaining samples with exceedances were noted during analysis as having major discolouration and turbidity due to organic matter. This is likely a result of agricultural activities on the neighbouring lands, as opposed to quarry activities. This is particularly relevant at D1K, D2K and D5K, as they were all located around the northwest boundary of the site in the prevailing wind direct of the surrounding agricultural land.

Exceedances observed at D3K and D4K are likely related to their close proximity to the quarry entrance and position in the prevailing wind direction from the quarry pit.

Exceedances were identified at D3K from 06/03/2020 to 20/05/2020. The longer duration of monitoring was due to Covid-19 travel restrictions preventing the sample from being retrieved. A number of factors may have contributed to the exceedance at this location during this period. It is again likely that the exceedances at D3K were related to the proximity to the quarry entrance and also the prevailing wind direction. Furthermore, reduced work practices and dust suppression on

the site during the national lockdown coupled with the dry weather may have also contributed to the exceedances, as no personnel were available on site to operate dust suppression measures.

Location D6K was established to acquire baseline levels and decommissioned at the end of 2022 as the location was not representative of the quarry activities, and exceedances are considered likely to be more representative of the road itself. Location D7K was decommissioned at the same time. This was not considered a representative location for the quarry operations and within an area where organic matter would likely contaminate the samples. Exceedances seen at D7K are attributed to organic matter from the forest location. Location D8K was also decommissioned at the end of 2022, again it was not considered representative of the quarry activities as it was located next to another quarry owned and operated by a separate operator (not the Applicant). Again, it is thought that exceedances observed here are related to the location of the monitoring point, being close to another quarry and therefore not being solely representative of the Applicant's Site.

Assessment of Values and Limit

In general, the average concentrations of deposited dust during the assessment period were 231.2 mg/m^2/day, which includes the recorded exceedances. This amounts to 66% of the limit value of 350 mg/m^2/day.

It should be noted that there is some variability in the concentrations recorded across the monitoring months and locations. As such, the quarry's contribution of recorded deposited dust cannot be clearly distinguished within the monitoring data. This suggests that deposited dust from the operation of the quarry has been deposited within the site or very close to the site, rather than being carried far off-site.

7.5.4.2 Secondary Data – EPA Monitoring

A review of publicly available information identifies that the Irish EPA historically undertook background monitoring at three locations in Kildare; Celbridge, Naas and Newbridge. None of these are currently active and none are located in the vicinity of the Development. The most recent monitoring was undertaken at Celbridge, located approximately 17 km north from the Development, although monitoring at this location ceased in 2011. The last reported data from EPA, Ambient Air Monitoring at Celbridge Co. Kildare 12th July 2010 - 10th April 2011 (http://www.epa.ie/pubs/reports/air/monitoring/ambientairmonitoringcelbridge.html) is summarised in Table 7-11 below. No $PM_{2.5}$ monitoring was undertaken at this location.

Table 7-11 - 2010/ 2011 Background Monitoring Data for PM10 at Celbridge

	Averaging Period	Concentration (µg/m^3)
PM_{10}	Annual Average	19.5
	90.4%ile daily average	37.3

In the absence of local background data, the most recent annual mean $PM_{2.5}$ and PM_{10} data from other monitoring locations in Zone D areas from the Air Quality monitoring network is detailed in Table 7-12. These locations are part of the EPA National Ambient Air Quality Monitoring Network and data is reported to Europe. All monitored concentrations are below the annual AQS. There are monitoring stations located at Naas and Newbridge, but these have been omitted from this table as unsuitable due to their Zone B location.

Table 7-12 - Annual Mean Monitoring Data for Zone D Stations (Air Quality – Summary Results 2022, 2023 https://www.epa.ie/publications/monitoring--assessment/air/air-quality-in-ireland-2022.php)

	Monitoring Location	Concentration (mg/m^3)
PM_{10}	Birr	14.5
	Carrick-on-Shannon/Askeaton	9.4
	Castlebar	11.2
	Cavan	11.0
	Claremorris	7.9
	Cobh Carrignafoy	13.2
	Cobh Cork Harbour	14.4
	Edenderry	17.7
	Enniscorthy	15.0
	Kilkitt	8.5
	Killarney, Co. Kerry	9.1
	Longford	16.0
	Macroom	16.1
	Mallow	13.5
	Roscommon Town	11.2
	Tipperary Town	13.9
	Average	**12.7**
$PM_{2.5}$	Birr	9.5
	Carrick-on-Shannon/Askeaton	6.3
	Cavan	7.3
	Claremorris	6.1
	Cobh Carrignafoy	7.6
	Edenderry	13.4
	Enniscorthy	10.2
	Killarney, Co. Kerry	5.6
	Longford	10.9
	Macroom	11.0
	Mallow	7.5
	Roscommon Town	7.6
	Shannon Estuary/Askeaton, Co. Limerick	5.5
	Tipperary Town	9.1
	Average	**8.4**

7.5.5 SENSITIVE HABITATS AND ECOSYSTEMS

There is the potential for dust from quarries and extractive sites to potentially cause ecological stress on some vegetation species and communities. During prolonged dry periods deposited dust can result in direct physical impacts through inhibited photosynthesis. Generally, more alkaline dusts e.g., cement dust from construction processes can increase the surface alkalinity, which can in turn hydrolyse lipid and wax components, penetrate the cuticle, and denature proteins, finally causing the leaf to wilt (IAQM, 2016). Such alkaline dusts are not present on the Site.

Advice provided within the Design Manual for Roads and Bridges (DMRB) suggests that the most sensitive species appear to be affected by dust deposition at levels above 1,000 mg/m^2/day. Most species appear to be unaffected until dust deposition rates are at levels considerably higher than this.

Accordingly, given that the average dust deposition recorded at the Site is less than a quarter of the trigger level of 1,000 mg/m^2/day, it is considered unlikely that dust deposition will have had an impact on any nearby Natura 2000 designations, including Red Bog SAC. It is noted that there have been results recorded above this value, however these are believed to either be contaminated by organic material, or a result of poor positioning and therefore are not representative of the Applicant's site alone.

7.6 CHARACTERISTICS OF THE DEVELOPMENT

The extraction rate of aggregate at the quarry throughout the assessment period has been on average below 1,000,000 tonnes per year. Overburden has been stripped by machinery and used to construct perimeter berms and stockpiled for reuse in the staged restoration program for the quarry. In terms of the detailed operation of the quarry; sand and gravel, and rock, has been extracted by two separate methods. The first method involves the extraction of overlying sand and gravel by mechanical means (excavation by mobile excavator). An excavator loads the material onto dump trucks, which transports the material to the fixed aggregate processing plant on the quarry surface. This aggregate processing plant has operated a wet process where the aggregate is washed and screened before being segregated into stockpiles of different sized product. The aggregate processing plant has operated a closed circuit washing system where water is recirculated. This system has resulted in significantly lower fugitive dust emissions compared with dry screening processes. The second method has extracted rock by blasting followed by rock-breaking (excavator attachment), and crushing and screening on the pit floor, (carried out by mobile crushing and screening units). The screened rock has also been segregated into stockpiles of different sized product. Front-end loaders load the aggregate products at both locations onto trucks for onward transportation to market.

All trucks have passed through the wheelwash prior to leaving the Site. The hours of operation of have been:

- Excavation and processing of material between 0800 hours and 1800 hours, Monday to Friday and between 0800 hours and 1300 hours on Saturdays.
- Loading and transporting of processed material between 0700 hours and 1800 hours: Monday to Friday and between 0700 hours and 1300 hours on Saturdays.
- No activities on Sundays or public holidays

The following activities associated with the quarry-pit are the most likely dust generating sources:

- Movement of full and empty trucks along haul roads;
- Stripping of subsoil and overburden;
- Loading and movement of overburden to dump areas;
- Blasting and rock breaking;
- Extraction of materials;
- Loading of materials;
- Unloading of overburden for restoration; and
- Wind erosion at dump areas and exposed faces.

7.7 POTENTIAL EFFECTS

7.7.1 SOURCES

The activities associated with the operation of the Development throughout the assessment period that are the most likely dust generating sources are listed in Section 7.3 of this assessment.

The following residual source classifications can be attributed based on the sources and management and assessment methodology outlined above and in Section 7.4 (IAQM, Appendix 4, 2016):

Site preparation/restoration is classified as a large magnitude source due to the size of the working area. The land subject to this rEIAR extends ca. 95.8 ha. reflecting historic operational site information. The actual working area may have been smaller, but this conservative value has been used in the assessment.

Mineral extraction is classified as a medium magnitude source due to the large average annual extraction rate of up to ca. 1,000,000 t/yr of aggregate within the working area, and a low dust potential due to sand and gravel processing being a wet process.

Materials handling is classified as a medium magnitude source as although there has been >10 heavy plant, they have operated within the quarry void and on a material of low dust potential.

On-site transportation is classified as a large magnitude source as there has been >250 on-site HGV trips per day on unpaved haul roads up to 1.5 km in length.

Mineral processing is classified as a medium magnitude source due to there being mobile processing plant on the pit floor processing rock, and also a fixed processing plant on the surface screening sand and gravel in a wet process.

Stockpiles (of aggregate) and exposed surfaces are classified as a medium magnitude source due to the large average annual quarry production of 1,000,000 t/yr, combined with the fact that stockpiles have been temporary and located within the void on the pit floor, and all bunds have been seeded.

Off-site transportation is classified as a medium magnitude source as there have been no changes in AADT during the assessment period compared to prior (approximately 148 outward HDV movements per day), and the fact that the wheel wash has been used by all exiting HDVs, tractors

and trailers, a fixed sprinkler system is in place between the weighbridge and public road for drier periods, as well as daily clearing of debris from the exit to the public road.

7.7.2 SITE PARAMETERS

The risks of potential dust emissions associated with the Application Site being transported off-site are largely determined by the local atmospheric conditions surrounding the Site and 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 site boundary;
- Wind direction, to identify the areas over which particles are likely to travel.

As detailed in Section 7.5.3, the closest Met Éireann station to the Site is located at Casement, Co. Dublin, ca. 10 km north-northeast of the Application Site. Wind speed and wind direction are measured hourly by the station and a wind-rose has been presented in Figure 7-2. The total monthly rainfall data has also been summarised in Table 7-8. The wind and rainfall data both cover the period from September 2020 to November 2023.

The prevailing wind direction is from the southwest, with a large portion of mid wind speeds between 5 - 7 m/s and some higher wind speeds of >7 m/s.

The receptors identified in Table 7-12 and presented in Figure 7 4 and Figure 7-5, with their associated distance and direction, are located within 500 m of the site activities. Residential receptors have been categorised as high sensitivity receptors. The remaining non-residential (industrial) receptors have been categorised as medium sensitivity receptors. The category of receptor distance is defined based on the criteria in Table 7-6 of the methodology and the frequency of dusty winds is determined based on the criteria in Table 7-5 of the methodology. The receptor distance category and the frequency of dusty winds are then combined using Table 7-7 of the methodology to define the pathway effectiveness.

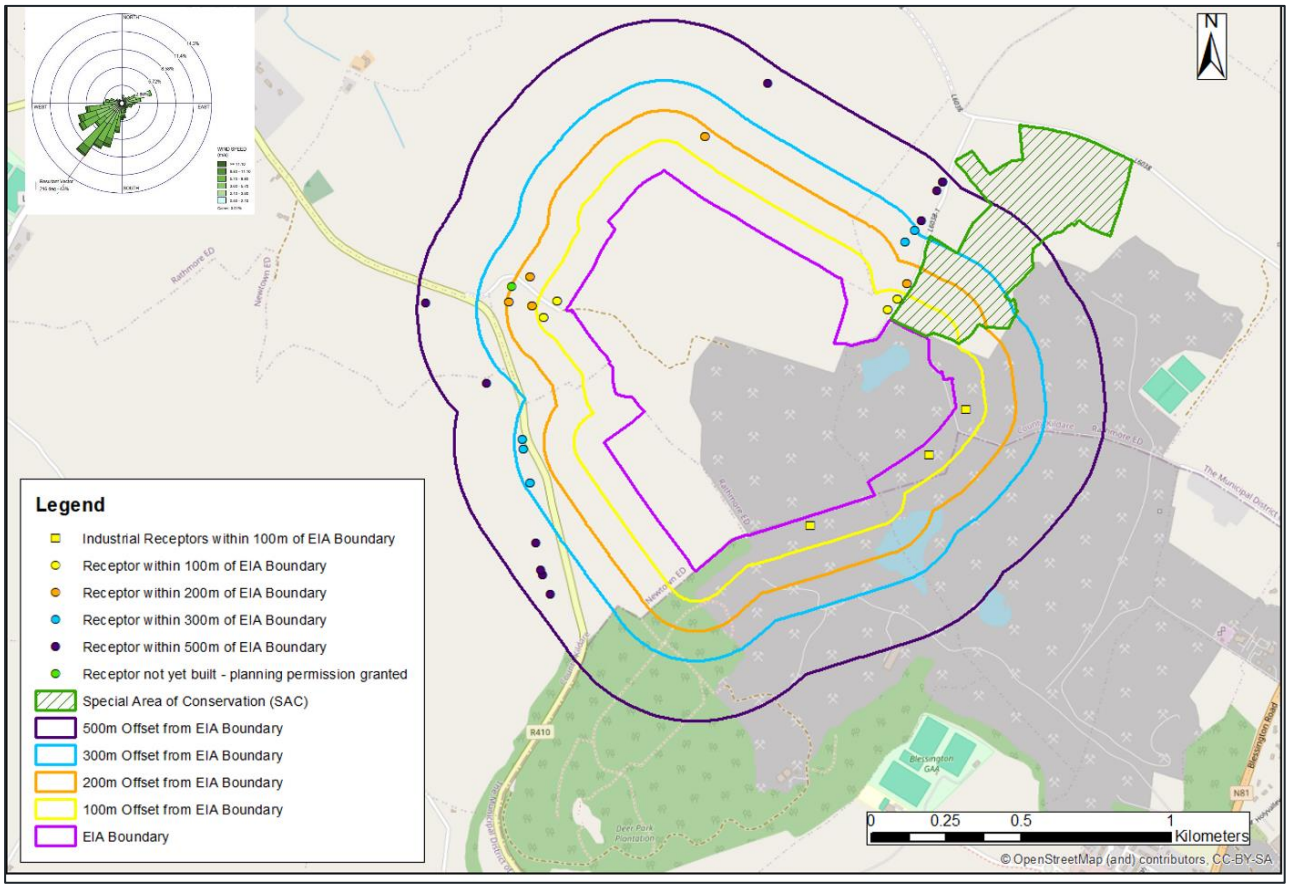


Figure 7-5 - Location of receptors within 500 m of the Site (including Application Site Boundary) and prevailing wind direction

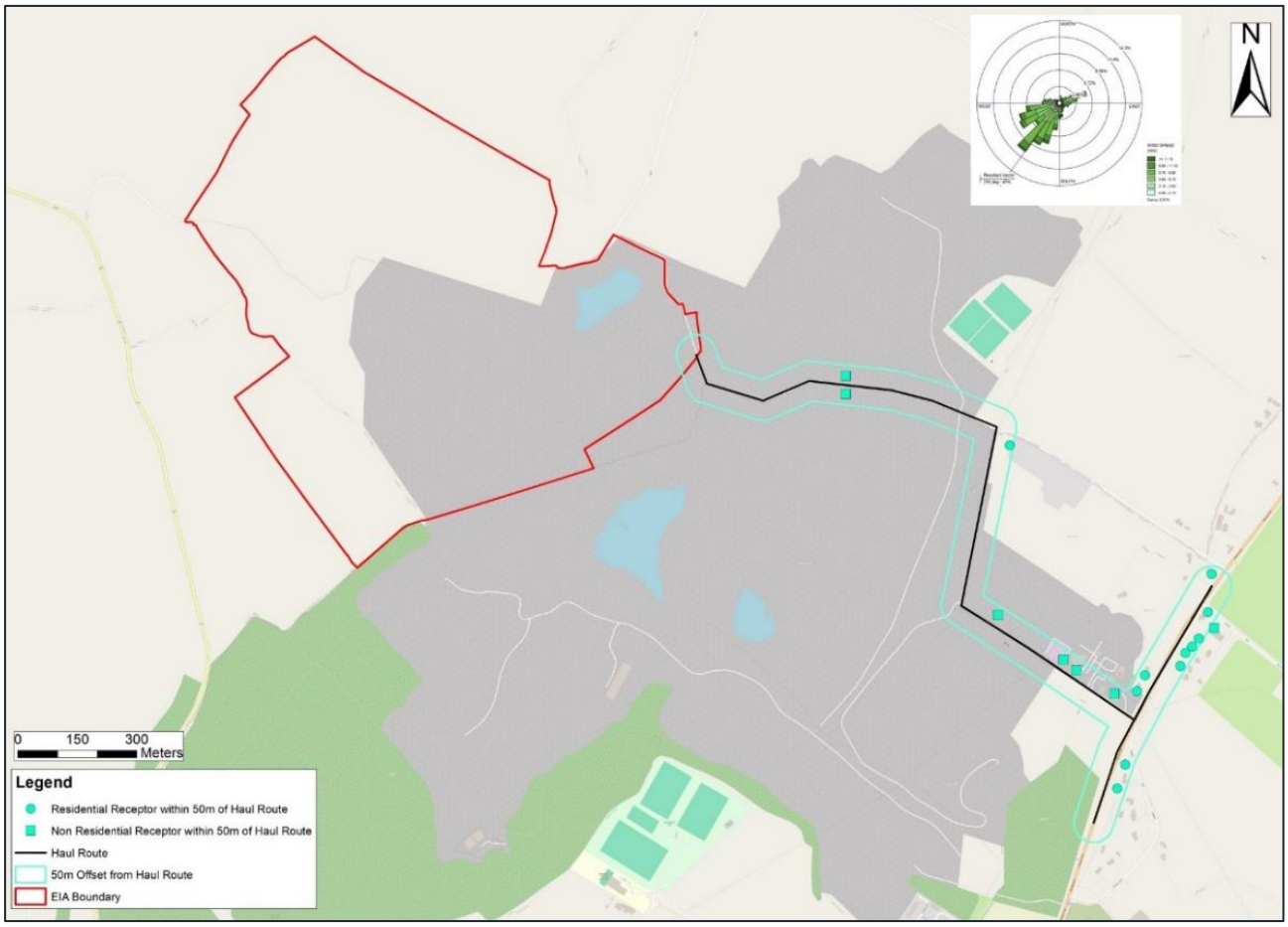


Figure 7-6 - Location of receptors within 50 m of the shared haul road, and within 50 m for a distance of 350 m along the public road from the point of exit of the haul road, in both directions.

Table 7-13 - Receptors within 500 m of the Site

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 within 50 m (of haul route)	11	Close	11	Moderate	Moderate
Residential within 100 m	4	Close	2	Moderate	Moderate
Residential within 200 m	6*	Intermediate	2	Moderate	Moderate
Residential within 300 m	5	Distant	2	Moderate	Ineffective
Residential within 500 m	10	Distant	4	Moderate	Ineffective
Non-Residential within 50 m (of haul route)	7	Close	6	Moderate	Moderate
Non-Residential within 100 m	3	Close	2	Moderate	Moderate
Non-Residential within 200 m	0	Intermediate	0	Moderate	Moderate
Non-Residential within 300 m	0	Distant	0	Moderate	Ineffective
Non-Residential within 500 m	0	Distant	0	Moderate	Ineffective
Red Bog SAC within 300 m	1	Distant	1	Moderate	Ineffective
Glen Ding Woods within 100 m	1	Close	0	Moderate	Moderate

* Includes 1 residential property which is not yet built but has planning permission

7.7.3 ASSESSMENT OF COARSE PARTICLES

Assessment of the dis-amenity dust associated with the operation of the Site during the assessment period is summarised for each receptor in Table 7-14. Following the IAQM guidance the nature of the Site and the existing mitigation measures (outlined in Section 7.7.5) suggest that the magnitude of any deposited dust effects will range from ‘moderately adverse’ to ‘negligible’, with the majority of receptors receiving ‘slight adverse’ effects.

Table 7-14 - Assessment of Dust Dis-amenity 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 within 50 m (of haul route)	Large	Moderate	Medium Risk	High	Moderate Adverse effect
Residential within 100 m	Large	Moderate	Medium Risk	High	Moderate Adverse effect
Residential within 200 m	Large	Moderate	Medium Risk	High	Moderate Adverse effect
Residential within 300 m	Large	Ineffective	Low Risk	High	Slight Adverse effect
Residential within 500 m	Large	Ineffective	Low Risk	High	Slight Adverse effect
Non-Residential within 50 m (of haul route)	Large	Moderate	Medium Risk	Medium	Slight Adverse effect
Non-Residential within 100 m	Large	Moderate	Medium Risk	Medium	Slight Adverse effect
Non-Residential within 200 m	Large	Moderate	Medium Risk	Medium	Slight Adverse effect
Non-Residential within 300 m	Large	Ineffective	Low Risk	Medium	Negligible effect
Non-Residential within 500 m	Large	Ineffective	Low Risk	Medium	Negligible effect
Red Bog SAC within 300 m	Large	Ineffective	Low Risk	High[1]	Slight Adverse effect
Glen Ding Woods within 100 m	Large	Moderate	Medium Risk	Low	Negligible effect

[1]High-risk receptor due to SAC designation

7.7.4 ASSESSMENT OF FINE PARTICLES

The IAQM recommend that if the PM_{10} background concentration is less than 17 µg/m^3 there is little risk that the process contribution (PC) from the Site would lead to an exceedance of the annual-mean objective. The background data from other equivalent Zone D areas is detailed in Section 7.5.4.2 of this report. The annual average of the Zone D stations is 12.7 µg/m^3 which is less than 17

µg/m^3. It is therefore unlikely that the PC from the Site would have led to an exceedance of the AQS.

Fine particulate PC can also be assessed using the calculation of concentration with distance from source (for conservatism the site boundary is used) as detailed in LAQM TG03. The guidance document also states that the likely PM_{10} contribution from fugitive dusts, stockpiles, quarries and construction is variable but up to 5 µg/m^3. Therefore, the likely concentration at the receptor locations can be estimated using the calculation considering the distance from source. As $PM_{2.5}$ is a sub-fraction of PM_{10}, the contribution of $PM_{2.5}$ will be lower but if it is conservatively assumed that all of the PM_{10} is $PM_{2.5}$, the increase in concentration due to the changed location of the extraction area is low. The assessment assumes that no mitigation is applied, where in reality the Site has historically employed a number of mitigation measures for the duration of the assessment period.

When combining the likely concentration with the average historical background value (12.7 µg/m^3) for Zone D areas, the maximum annual PM_{10} predicted environmental concentration (PEC) would be 14.2 µg/m^3 which is approximately 57% of the AQS and the annual $PM_{2.5}$ PEC would be 57% of the Stage 1 AQS and 71% of the Stage 2 AQS, at the closest receptor, and less than this for all other receptors in the vicinity of the Site. The PEC is predicted to be below the annual AQS, with headroom. The impact from fine particle PC from the Site is considered to be Negligible to Slight without mitigation, which would reduce to negligible due to the mitigation measures employed historically by the Site.

Table 7-15 - Assessment of Fine Particulates at Closest Downwind Receptors

Receptor Type and Distance Band	Number of Receptors in Distance Band	Number of Receptors in Prevailing Wind Direction (NE of Boundary)	Distance from source (m)	Relative concentration (with fallout from source)	Estimated concentration (µg/m^3) at receptor band, assuming source emission of 5 µg/m^3
Residential within 0 m - 100 m of source	15	13	50	30%	1.5
Residential within 100 m - 200 m	6*	2	100	18%	0.9
Residential within 200 m - 300 m	5	2	200	8%	0.4

* Includes 1 residential property which is not yet built but has planning permission

7.7.5 MITIGATION MEASURES EMPLOYED DURING ASSESSMENT PERIOD

Details of mitigation measures that have been employed at the Site for the duration of the assessment period are summarised below. The aim of these measures has been to reduce the impact of potential dust emissions on the surrounding area and identified sensitive receptors.

- Dust monitoring at designated monitoring locations on a monthly basis. Exact locations have changed over the course of the assessment period due to being inappropriate or due to work locations changing, but in these cases monitoring locations have been repositioned within the Site boundary at the closest location to the relevant sensitive receptor;
- The timing of operations is optimised in relation to meteorological conditions, for example overburden has not been stripped during dry periods to reduce potential dust emissions;
- Material in outdoor stockpiling is located away from sensitive receptors and prevailing wind to minimise dust erosion;
- A water bowser is available on Site for dust suppression/dampening to minimise dust blow during working hours;
- There is also a water bowser deployed on the haul road between the Applicant's Kildare and Wicklow sites. A fixed water spray system is also available on the Applicant's own section of the haul route during drier periods;
- HGV's carrying fine aggregate are covered prior to exiting the quarry;
- A sprinkler system is in place between the weighbridge and public road and available during drier periods. This route is cleared daily from loose dirt and debris at the exit point to the public road;
- Plant is regularly maintained;
- On site speed restrictions (<30 kph) are maintained in order to limit the generation of fugitive dust emissions; and
- All vehicles exiting the existing site exit through the existing wheel-wash to minimise trackout.

Table 7-16 assesses the potential impacts from the operation of the Development during the assessment period on the local air quality both with and without the establishment of appropriate mitigation measures detailed above. The duration of these effects will occur in the medium term during the quarry's phased operations (i.e., during stripping, extraction and restoration). Definitions of effect significance are as defined in the EPA's 2022 'Guidelines on the information to be contained in environmental impact assessment reports'.

Without mitigation measures it is considered that dust impacts from extraction activities may not affect the character of an environment but would have 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 sensitivities.

Table 7-16 - Assessment of Impacts to Local Air Quality and Mitigation Measures Employed

Impact	With / Without the establishment of Mitigation Measures	Type of Effect	Quality of Effects	Significance of Effects	Duration of Effects
Dust from excavation	Without	Direct	Negative	Moderate	Short term
Dust from excavation	With	Direct	Negative	Slight	Short term
Dust from transfer on haul roads	Without	Direct	Negative	Moderate	Short term
Dust from transfer on haul roads	With	Direct	Negative	Slight	Short term
Dust from transfer on public roads	Without	Direct	Negative	Moderate	Short term
Dust from transfer on public roads	With	Direct	Negative	Slight	Short term
Dust from on-site processing (crushing and screening)	Without	Direct	Negative	Moderate	Short term
Dust from on-site processing (crushing and screening)	With	Direct	Negative	Slight	Short term

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).

7.8 REMEDIAL MEASURES REQUIRED

Taking into consideration the mitigation measures which have been employed at the site throughout the assessment period, as detailed above in Section 7.7.5, it is not considered necessary that any additional remedial measures are put in place.

7.9 RESIDUAL EFFECTS

Residual impacts of deposited dust and particulates generated during the operations at the Site since September 2020 on air quality are considered to be slight. During long spells of dry weather,

dust emissions may have had the potential to be elevated, however dust nuisance from the operation is expected to have been unlikely as the above mitigation measures were implemented during construction and operation. The overall impact from the operation of the Site since 1990, in terms of dust emissions and particulates, is considered 'slight' to the air environment and Not Significant.

7.10 CUMULATIVE EFFECTS

Research has shown that the greatest proportion of dust predominantly deposits within the first 100 m away from the source (The Environmental Effects of Dust from Surface Mineral Workings, Volume 1 DETR, HMSO 1995) as dust has a higher deposition velocity than finer particles (i.e. PM_{10} and $PM_{2.5}$). The finer particles of less than 10 microns aerodynamic diameter may remain airborne for longer and therefore travel larger distances, although a large proportion may still deposit within 200 m of the source.

The assessment undertaken has considered publicly available background monitoring data and incorporated this into the assessment, therefore the assessment includes a consideration for other Sites operating in the area i.e. those immediately adjacent.

The Site and the adjacent quarry operations have a shared section of the haul road. Vehicles from the Site split off and have a separate section of haul road and exit onto the N81 public road via the Applicant's Wicklow site. The Applicant's sites also have a shared weighbridge which is located on the Wicklow site, therefore traffic from the Site must pass through the Wicklow site in order to use it. The mitigation measures outlined in Section 7.7.5 which have been undertaken throughout the assessment period are deemed to have provided sufficient mitigation against significant effects from the Site. These mitigation measures are also deemed to have provided a level of cumulative mitigation for the shared haul road, as the Applicant deploys a water bowser to suppress dust on this shared haul route. There is also a sprinkler system which has been available for drier periods and daily road sweeping has been undertaken at the exit to the N81 public road, which is shared by the two Hudson Brothers Ltd sites, and other businesses located on this access road. It is assumed that the quarries owned by other operators to the east and south have also employed mitigation measures throughout their operations over the assessment period as good practice, however the measures outlined in this document will have provided some cumulative mitigation as mentioned. Therefore, it is considered unlikely that there has been a notable cumulative impact relating to air quality from these sites in terms of the haul road.

The same conclusion is made for the quarries, because good practice measures similar to those outlined in Section 7.7.5 should have been in place at the surrounding sites, therefore minimising the likelihood of significant cumulative impacts relating to air quality. However, should this not have been the case, the level of mitigation which has been employed at the Site for example covered aggregate trucks, dampening, ceasing particularly dusty activities during dry weather, and perimeter bunds, are sufficient as to have prevented a significant level of dust from interacting with other quarries, therefore acting to prevent cumulative impacts as far as is practicable from the Site.

7.11 DIFFICULTIES ENCOUNTERED

During this assessment the following have been noted which have caused difficulty in assessing the potential impacts of air quality on the environment retrospectively, although they are not considered likely to have affected the outcome of the assessment:

- Sampling jars at dust monitoring locations found to be missing or smashed upon collection, as such data for certain months is absent from the data set. To note, the Applicant now employs plastic jars to negate the latter issue.
- Due to restrictions in place as a result of the Covid-19 pandemic, the sample jars set out in March 2020 could not be collected after 28 days, and instead were collected in May 2020. As a result the obtained dust deposition results may not be full representative as the averaging period was doubled.

7.12 CONSIDERATION OF THIRD-PARTY SUBMISSIONS MADE DURING THE HBL 2020 PLANNING APPLICATION (KCC REG. REF.: 20/532)

Following the submission of the 2020 planning application (KCC Reg. Ref.: 20/532) a number of third-party submissions were received by KCC. These third-party submissions were considered as part of the Further Information response submitted to KCC prior to the invalidation of the application in September 2020. In the compilation of this section these submissions, concerns and points of note have been addressed in this assessment. Table 7-17 below provides a general summary of submissions relevant to this section and details where or how this item has been considered.

Table 7-17 - KCC Reg. Ref.: 20/532 Third-Party Submissions Items Relevant to the Air Quality Assessment

Submission Item Summary	Comment
Residential amenity	There are no deteriorating trends in air quality, see sections 7.5.4 and 7.5.5
Noise, dust & air pollution	The potential impact from dust has been discussed and assessed throughout this chapter, with the overall impact categorised as 'Not Significant'.
Generation of dust on haul roads must be fully considered and addressed through appropriate and detailed mitigation measures	Dust generation from the haul road is fully considered as part of the existing mitigation measures which have been implemented
Dust monitoring to be to be undertaken at the location of the nearest occupied dwellings in addition to locations at the site boundary. Monitoring should be considered at locations of sensitive receptors along haul routes, including where appropriate at schools, houses, creches and outdoor sports facilities or playing fields	Dust monitoring locations have been chosen in order to be representative of sensitive receptors, see section 7.5.4.1
Include steps to be undertaken where noise, air water quality exceedances occur	Steps for air quality exceedances are managed on site under the HBL Environmental Management System.
On air and dust monitoring should take place at sensitive receptors along haul routes where appropriate including schools, houses, creches and outdoor sport facilities or playing fields;	Dust monitoring locations have been chosen in order to be representative of sensitive receptors, see section 7.5.4.1

7.13 SUMMARY AND CONCLUSIONS

This rEIAR chapter has assessed the potential impacts of the operation of the Site between September 2020 and the present day on Air Quality. The possible sources of emissions to air were identified as particulates only.

The impact of coarse particulates (dust) on the surrounding area as a result of the previous activities at the Site is considered to have been 'slight' and therefore Not Significant. The assessment considered the employed mitigation measures which have been and will continue to be in place. With regards to fine particulates, it is considered that there may have been the potential for an increase in PM_{10} and $PM_{2.5}$ concentrations at the residential receptors downwind in the vicinity of the Site, due to the moving of the extraction area, but the PEC is still predicted to be below the annual AQS, with headroom. The impact of fine particle PC from the Site is therefore considered to be imperceptible and therefore Not Significant.

7.14 REFERENCES

Annual Air Quality in Ireland Report 2022 (Environmental Protection Agency, 2023).

Climate Change and Major Projects (European Commission, 2016).

Design Manual for Roads and Bridges (UK) (DMRB, 2020).

Environmental Code 2nd Edition (Irish Concrete Federation, 2005).

Environmental Protection UK / Institute of Air Quality Management (EPUK/IAQM, 2017) Land-Use Planning and Development Control: Planning for Air Quality,v1.2, 2017.

Guideline Document entitled Environmental Management in the Extractive Industries, (EPA, 2006).

Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, (EPA, 2022).

Institute of Air Quality Management (IAQM, 2016) Guidance on the assessment of mineral dust for Planning.

Process Guidance Note 3/08 (12) – Secretary of State's Guidance for Quarry Processes (DEFRA (UK), 2012).

Process Guidance Note 3/16 (12) – Secretary of State's Guidance for Mobile Crushing and Screening (DEFRA (UK), 2012).

Quarries and Ancillary Activities – Guidelines for Planning Authorities (DOEHLG, 2004).

Safe Quarry – Guidelines to the Safety, Health and Welfare at Work (Quarries) Regulations 2008 (Health and Safety Authority, 2008).

The Environmental Effects of Dust from Surface Mineral Workings, Volume 1 DETR, HMSO 1995.

The Kildare County Development Plan 2023-2029 (KCDP), (Kildare County Council, 2023).