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INTRODUCTION

Background

8.1 This chapter of the Environmental Impact Assessment Report (EIAR), prepared by SLR Consulting Ireland, provides supporting information to accompany a planning application to Meath County Council by Kilsaran Concrete Unlimited Company (also referenced as Kilsaran or Kilsaran Concrete). It primarily addresses potential air quality related impacts from the proposed new sand and gravel extraction development at Naul townland, Ford-de-Fine, County Meath.

8.2 The development provides for:

- Extraction and processing on site, to include washing (with associated closed recycled washing plant and lagoon system), screening and crushing plant; storage; stockpiling and haulage of sand and gravel to service the existing readymix concrete plant operated by Kilsaran on the eastern side of the R108 regional road and permitted under P. Ref. 80/572 & 22/153 (ABP-314881-22);
- The total extraction proposal extends to an area of c. 6.2 hectares and will be worked (extracted and restored) on a phased basis for a period of 11 years plus 1 year to complete final restoration works (total duration of 12 years);
- Phased stripping and storage of topsoil and overburden materials for reuse in the restoration works. Restoration of the site will be to a beneficial agricultural after-use;
- Access to the site will be through the existing agricultural enterprise site entrance onto the R108 regional road with upgrade of same to consist of setting-back of the existing boundary wall to the north of the site access, and provision for the upgrade of the existing internal access track and sections of a new access track which will include a new weighbridge; and
- All associated site ancillary works within an overall application area of c. 14.9 hectares.

8.3 Further information on the site infrastructure, operations, environmental management systems, and controls at the proposed sand and gravel pit site is provided in chapter 2 of this EIAR.

8.4 The proposed development will have the potential to generate additional fugitive dust emissions and particulates (PM_{10}), which may result in impacts on local air quality.

8.5 Combustion emissions (primary PM_{10}, and oxides of nitrogen) from vehicle exhaust emissions associated with the extraction and transportation of aggregates will also have the potential to impact on local air pollution.

Scope of Work

8.6 The focus of this assessment is the potential impact on local amenity from increased fugitive dust emissions and particulate matter at the proposed sand and gravel pit (i.e. the proposed new development within the red line application area west of the R108 regional road) in combination with the existing Kilsaran concrete batching facility (established and permitted development to east side of R108 regional road).

8.7 The principal air quality impact associated with the proposed development through deposition on land is fugitive dust emission. Dust emissions are likely to arise in the course of the following activities:

- trafficking by onsite machinery and heavy goods vehicles (HGVs) over paved / unpaved surfaces;
- end-tipping, handling, and processing of material;

- stockpiling of aggregates;
- soils stripping, earthworks and stockpiling of topsoil pending final surface restoration works; and
- landscaping and final restoration activities.

8.8 With respect to the potential for air quality impacts, the key objective at the application site is to manage activities in order to ensure that air emissions are prevented where possible and the effects of any residual releases are minimised.

8.9 This EIAR chapter describes and assesses the existing air quality baseline characteristics of the area at and around the proposed sand and gravel pit based on site specific surveys and EPA data. Air emissions arising from the activities at the proposed pit site are then applied to these baseline conditions and the resulting air quality impacts assessed. Mitigation measures are identified where required, to eliminate and reduce these impacts insofar as practical.

8.10 The following sections of this chapter describe the potential air quality impacts associated with activities within the development. The following issues are addressed separately:

- relevant legislation, standards, and guidance;
- methodology used to assess the potential impacts of the activities at the proposed development on air quality at sensitive receptors;
- baseline conditions pertaining to the measured (or estimated) existing air quality levels around the site;
- assessment of the impacts;
- description of mitigation measures that are incorporated into the construction, design and operation of the proposed development to eliminate or reduce the potential for increased air quality impacts (if required);
- summary of any residual impacts;
- summary of cumulative impacts; and
- monitoring proposals.

Consultations / Consultees

8.11 In preparing the previous planning application (P. Ref. AA191263), a pre-planning consultation meeting was held between officials of Meath County Council and the applicant on the 2nd August 2019 at the offices of the Planning Authority. As the site is adjacent to the Meath-Dublin border, pre-planning consultation was also carried out with Fingal County Council at the time.

8.12 Although this planning application is for development broadly covering the same development as applied for previously under P. Ref. AA191263, owing to the lapse in time between planning applications, a further formal pre-planning meeting was held with Meath County Council Planning Department via Teams on the 30th May 2024.

8.13 Following a review of published development plans and the site survey, it was considered that there was no requirement for a separate formal consultation to be carried out regarding the potential air quality impacts of the proposed development.

Contributors / Author(s)

8.14 SLR Consulting Ireland undertook the impact assessment presented in this chapter on behalf of Kilsaran. The lead consultant for the study was Aldona Binchy MSc. Eng PIEMA Environmental Engineering and Conor Hughes MSc. Energy Science.

Limitations / Difficulties Encountered

8.15 This assessment is compiled based on published regional and local data, guidance documents, and site-specific field surveys. No difficulties were encountered in compiling the required information.

REGULATORY BACKGROUND

8.16 The following sections describe the main legislative policy requirements in respect of air quality associated with the proposed development.

Legislation

Air Quality Standards

8.17 The Government's policy on air quality within Ireland is set out in the Air Quality Standards (AQS) Regulations 2011. The CAFE Directive was transposed into Irish legislation by the Air Quality Standards Regulations 2011 (S.I. No. 180 of 2011). It replaces the Air Quality Standards Regulations 2002 (S.I. No. 271 of 2002), the Ozone in Ambient Air Regulations 2004 (S.I. No. 53 of 2004) and the EPA Act 1992 (Ambient Air Quality Assessment and Management) Regulations 1999 (S.I. No. 33 of 1999). The 4th Daughter Directive was transposed by the Arsenic, Cadmium, Mercury, Nickel and Polycyclic Aromatic Hydrocarbons in Ambient Air Regulations 2009 (S.I.no. 58 of 2009).

8.18 The AQS sets out a framework for reducing hazards to health from air pollution and ensuring that international commitments are met in Ireland.

8.19 The AQS sets standards and objectives for ten priority pollutants. Standards establish concentrations of pollutants in the atmosphere which can broadly be taken to provide a certain level of environmental quality. Objectives are policy targets, often expressed as maximum concentrations, not to be exceeded (either without exception, or with a limited number of exceedances within a specified timescale).

8.20 Under the AQS, the following pollutants are monitored and controlled:

- nitrogen oxides;
- sulphur dioxide;
- carbon monoxide;
- ozone;
- particulate matter (PM_{10}, $PM_{2.5}$ and black smoke);
- benzene and volatile organic compounds;
- heavy metals; and
- polycyclic aromatic hydrocarbons.

8.21 A summary of relevant air quality limit values normally associated with aggregate extraction and associated HGV traffic in relation to human health are presented in Error! Reference source not

found.. Air quality limit values in relation to vegetation protection are presented separately in Error! Reference source not found..

8.22 The air quality monitoring network is coordinated and managed by the EPA, as the National Reference Laboratory for air quality. The EPA co-ordinates and manages a nationwide network of over 110 monitoring stations which measures the levels of air pollutants and delivers this information to the public. The EPA is finalising the National Ambient Air Quality Monitoring Programme, which involves a greatly expanded national monitoring network providing enhanced real-time information to the public, as well as an increased local authority capacity to conduct indicative air monitoring. The results of the monitoring are compared to limit values set out in EU and national legislation on ambient air quality. Map-based assessments of air quality are prepared and published by the EPA.

Table 8-1
Relevant Air Quality Limit Values for Protection of Human Health[1]

Human Health	Limit or Target Value			Information & Alert Thresholds (Where Applicable)		Long Term Objective
Pollutant	Averaging Period	Value	Max No. of Allowed Occurrences	Period	Threshold value	
Nitrogen Dioxide (NO_2)	Hour Year	200 µg/m^3 40 µg/m^3	18 0	1 hour alert	400 µg/m^3 Exceeded for 3 consecutive hours	
Sulphur Dioxide (SO_2)	Hour Day	350 µg/m^3 125 µg/m^3	24 3	1 hour alert	500 µg/m^3 Exceeded for 3 consecutive hours	
Particulate matter with aerodynamic diameter of less than 10 µm (PM_{10})	Day Year	50 µg/m^3 40 µg/m^3	35 0			
Particulate matter with aerodynamic diameter of less than 2.5 µm ($PM_{2.5}$)	Year	25 µg/m^3 20 µg/m^3 (ECO)				0 8.5 to 18 µg/m^3

Table 8-2
Summary of Air Quality Limit Values: Protection of Vegetation[2]

Vegetation	Critical Level or Target Value		Long-term Objective	
Pollutant	Averaging Period	Value	Value	Date
Nitrogen dioxide (NOx)	Calendar year	30 µg/m^3		

[1] World Health Organisation (WHO) Air Quality Guidelines & Advice Note (IAN) prepared as a supplement for Volume 11, Section 3, Part 1 of the UK DMRB (Design Manual for Roads and Bridges) and now incorporated into HA 207/07)

[2] Institute of Air Quality Management (IAQM) 2019 A guide to the assessment of air quality impacts on designated nature conservation sites

Vegetation	Critical Level or Target Value		Long-term Objective	
Sulphur Dioxide (SO_2)	Calendar year and winter (October to March)	20 µg/m^3		

Planning Policy and Development Control

National Spatial Strategy (NSS) / National Planning Framework – Project Ireland 2040

8.23 The National Planning Framework (NPF) 2040[3] (published in February 2018) is a national planning framework for Ireland. The framework provides the policies for all regional and local plans. In the framework, the extractive industries are recognised as important for the supply of aggregates and construction materials to variety of sectors. It emphasises that the planning process will play a key role in realising the potential of the extractive industries and protecting reserves of aggregates and minerals. Aggregates and minerals extraction will continue to be enabled where this is compatible with protection of the environment.

8.24 There are no specific policies in relation to air emissions in the NPF for construction aggregates. The general objective is to facilitate the development while at the same time protect the environment.

Local Planning Policy – Meath County Development Plan 2021 – 2027

8.25 The current Meath County Development Plan (CDP) took effect from 3rd November 2021. The planning and development controls pertaining to the development site are still those outlined in the current Meath County Development Plan (2021 – 2027).

8.26 The development plan sets out the Council's role in relation to air quality which is to promote a reduction in air pollution, by means of relevant legislation and by providing advice and guidance on best practice.

8.27 The Meath CDP 2021 – 2027 has the following objectives in Chapter 6 *Infrastructure Strategy* in relation to air quality:

- **INF OBJ 71** *"To continue to monitor air and noise quality results submitted from selected locations throughout the County in co-operation with the Health Service Executive and the Environmental Protection Agency".*
- **INF OBJ 72** *"To support the collation or air quality and greenhouse gas monitoring data in support of a regional air quality and greenhouse gas emission inventory".*

Guidelines Extractive Industry Emissions Limit Values

8.28 In 1996, the Irish Concrete Federation (ICF), the trade body representing the interests of quarry operators and producers of construction materials, published the ICF Environmental Code which provided guidance for its members on best practice in the environmental management of quarries. The document was subsequently updated in 2005.

8.29 Section 261 of the Planning and Development Act 2000 (as amended), which regulates a significant proportion of established pit development, came into effect in April 2004. The Department of

[3] Draft First Revision to the National Planning Framework (issued July 2024)

Environment planning guidelines for the extractive industry 'Quarries and Ancillary Activities – Guidelines for Planning Authorities' (DoEHLG 2004) were published around the same time.

8.30 Separately, in 2006, the EPA published its Environmental Management Guidelines for Environmental Management in the Extractive Industry (Non-Scheduled Minerals).

Guidance Relating to Dust

8.31 Fractions of dust greater than 10 µm (micrometres) in diameter are not covered within the Air Quality Standards and typically relate to nuisance effects.

8.32 A range of monitoring techniques exist for dust deposition rates (i.e., Bergerhoff and Frisbee gauges). Extractive industry standard criteria levels for the gravimetric assessment of dust deposition which are generally used across extractive industry in Ireland include the DoEHLG (2004) planning guidelines for the extractive industry[4], the ICF Guidelines (2005) and EPA (2006) Environmental Management Guidelines.[5]

8.33 The Guidelines recommend the use of the Bergerhoff method for measuring dust deposition. In line with this approach, the guidelines recommend the TA Luft dust deposition limit value of 350 mg/m^2/day (total dust deposition averaged over a 30-day period), measured at site boundaries.

8.34 When the rate of accumulation of this coarser fraction of dust (referred to as deposited dust) is sufficiently rapid to cause fouling or discolouration, then it is generally considered to introduce a nuisance. The point at which an individual perceives dust deposition as a nuisance and causes a complaint is highly subjective.

8.35 The action of wind over dry ground will carry dust particles into the air. Although large emissions of dust occur naturally, man-made dust events are caused by a range of activities including agriculture, road traffic, construction works and by vehicles using paved and unpaved haul roads.

8.36 For operations involving the mechanical break up of solids, the most common concern regarding dust emissions is the potential nuisance effect from the larger fractions of dust.

Guidance on Assessment of Mineral Dust Impacts for Planning

8.37 Guidance on the assessment of the impacts of extractive operations on air quality has been prepared by the Institute of Air Quality Management (IAQM, 2016)[6]. This guidance uses a simple distance-based screening process to identify those operations where the dust impacts are unlikely to be significant and therefore require no further assessment. Where more detailed assessment is required, a basic assessment framework is presented which employs the Source-Pathway-Receptor approach to evaluate risk of impacts and effects.

Dust and Ecological Receptors

8.38 Much of the research on the effects of particulate matter on vegetation has focussed on the chemical effects of alkaline dusts. A summary of a review of available research on behalf of the UK's Department for the Environment Transport and Regions (DETR) concluded that:

8.39 *"The issue of dust on ecological receptors is largely confined to the associated chemical effect of dust, and particularly the effect of acidic or alkaline dust influencing vegetation through soils."*

[4] http://www.housing.gov.ie/sites/default/files/migratedfiles/en/Publications/DevelopmentandHousing/Planning/FileDownLoad%2C1606%2Cen.pdf

[5] https://www.epa.ie/pubs/advice/general/EPA_management_extractive_industry.pdf

[6] http://www.iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf

8.40 An Interim Advice Note (IAN) prepared as a supplement for Volume 11, Section 3, part 1 of the UK DMRB (Design Manual for Roads and Bridges) and now incorporated into HA207/07) suggests that only dust deposition levels above 1,000 mg/m^2/day are likely to affect sensitive ecological receptors. This level of dust deposition is approximately five times greater than the level at which most dust deposition may start to cause a perceptible nuisance to humans. It states that most species appear to be unaffected until dust deposition rates are at levels considerably higher than this.

A Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Area

8.41 Guidance on the assessment of the air quality impacts of development on designated nature conservation sites prepared by the Institute of Air Quality Management (IAQM, 2019). This guidance is also useful to evaluate the effects of air pollution on habitats and species using air quality assessment.

8.42 The predicted scale of dust effects may be classified as either 'significant', or 'not significant'. Where effects are predicted to be 'significant', further mitigation is likely required before the proposals are to be acceptable under planning policy.

Air Quality and Health Effects

8.43 The main health effects of air pollution can include stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma. These conditions can lead to sickness and ill health as well as premature mortality.

8.44 Two recent EPA reports, *Air Quality in Ireland 2021*[7] and *Ireland's Environment, An Assessment 2020*[8] detail the main air quality trends based on monitoring from the national ambient air quality network. There are monitored exceedances of the WHO guideline values for ozone, PM_{10} and $PM_{2.5}$ at several sites, though there are no current exceedances of the lower (less protective) EU standards at the existing monitoring locations in Ireland. The reports also highlight the main challenges of reducing air pollution from key sources such as particulate matter emissions from solid fuel burning (e.g., peat, coal, and wood) in the residential sector and NOx emissions from vehicles in the transport sector.

8.45 Europe as part of the Green Deal and the EU's Zero pollution visions for 2050 is revising its air quality standards to align them closely with the lower WHO recommendations.

8.46 A summary of relevant Air Quality limit values normally associated with aggregate extraction and associated HGV traffic in relation to human health was presented previously in **Table 8-1**.

Site Specific Emission Limits

8.47 The planning application site is currently a greenfield site.

8.48 Condition No. 4 of the planning permission ABP-314881-22 (P. Ref. 22/153) in relation to, inter alia the provision of a concrete reclaimer unit at the existing Kilsaran concrete batching plant states:

(a) "Dust levels at the site boundary shall not exceed 350 milligrams per square metre per day averaged over a continuous period of 30 days (Bergerhoff Gauge). Details of a monitoring programme for dust shall be submitted to, and agreed in writhing with, the planning authority prior to commencement of development. Details to be submitted shall include monitoring locations,

[7] Environmental Protection Agency, Air Quality in Ireland 2021 - Key Indicators of Ambient Air Quality. Available at: Monitoring & Assessment: Air Publications | Environmental Protection Agency (epa.ie)

[8] Environmental Protection Agency, Ireland's Environment, An Assessment 2020. Available at: State of the Environment | Environmental Protection Agency (epa.ie)

commencement date and the frequency of monitoring results, and details of all dust suppression measures

(b) A monthly survey and monitoring programme of dust and particulate emissions shall be undertaken to provide for compliance with these limits. Details of this programme, including the location of dust monitoring stations, and details of dust suppression measures to be carried out within the site, shall be submitted to, and agreed in writing with, the planning authority prior to commencement of use of the proposed concrete reclaimer unit. This programme shall include an annual review of all dust monitoring data, to be undertaken by a suitably qualified person acceptable to the planning authority. The results of the reviews shall be submitted to the planning authority within two weeks of completion. The developer shall carry out any amendments to the programme required by the planning authority following this annual review."

RECEIVING ENVIRONMENT

Study Area

8.49 The overall land interest is located c. 750 m northwest from the centre of Naul village on the northern side of the Delvin River. The Delvin River provides the county boundary between Meath and Dublin, with the village of Naul located within Dublin (Fingal administrative area) and the planning application site located in County Meath.

8.50 The R108 regional road passes to the east of the application site and runs from Dublin city centre to Drogheda, passing through Santry, Ballyboughal and Naul. The R122 passes to the south of the application site and runs from Balbriggan to the east, through Naul before turning south and meeting up with the R108 at St Margaret's to the west of Dublin airport.

8.51 Access to the national road network is via the local road network on the R122 regional road which provides access to both the M1 and M2 motorways.

8.52 The lands surrounding and within the existing land interest area comprise farm fields. The application site is not subject to any statutory or non-statutory nature conservation designations. Dwellings in the vicinity of application site are generally located along the local road network, both as isolated farmhouse structures and houses in clusters. The nearest dwellings to the landholding site boundary are identified on **Figure 8-1**.

Baseline Study Methodology

PM_{10} Monitoring

8.53 The application site and surrounding area fall into Air Quality Zone D, categorised as rural east Ireland. The air quality in each zone is assessed and classified with respect to upper and lower assessment thresholds based on measurements over eight years from 2014 to 2021. Upper and lower assessment thresholds are prescribed in legislation for each pollutant. The number of monitoring locations required is dependent on population size and whether ambient air quality concentrations exceed the upper assessment threshold, are between the upper and lower assessment thresholds, or are below the lower assessment threshold.

8.54 An active air quality monitoring location similar to the application site, and in a similar Zone D rural area, is located at Kilkitt, Co. Monaghan. As such, it is considered an appropriate dataset available for assessment of air quality baseline concentrations in the study area around the application site at Naul.

Site Baseline Dust Monitoring

8.55 Dust monitoring was conducted at and around the application site using the 'Bergerhoff method' referred to in the TA Luft Air Quality Standard. The deposition gauge used in the survey was the 'Bergerhoff' dust gauge, which comprises a plastic collection bottle and a post with protective basket, set at 1500 mm above ground level. The input of the atmospheric material into the bottle is determined over a planned period measurement (usually one month) by exposing the plastic collection bottle to the environment. The total dust collected in the bottle is expressed as deposition of insoluble particulate matter (mg/m^2/day) arising from fugitive actions in the area surrounding the application site.

Sources of Information

8.56 A desk study was carried out to examine all relevant information relating to air quality conditions around the application site. Met Eireann, the National Meteorological Service, was consulted in relation to the climate / weather data in respect of the study area (http://www.met.ie). The EPA website was examined to note information on baseline air monitoring data around the application site (http://www.epa.ie/air/quality/data/).

8.57 Information published on its website by the National Parks and Wildlife Service (NPWS) (http://webgis.npws.ie/npwsviewer/), part of the Department of the Environment, Community and Local Government (DoECLG), in respect of designated ecological sites, protected habitats and species was also reviewed, together with Ordnance Survey maps and aerial photography (http://map.geohive.ie/mapviewer.html).

Background Air Quality

8.58 An appropriate quality monitoring location similar to the application site, and in a similar Zone D area, is located at Kilkitt, Co. Monaghan.

8.59 The monitoring stations continuously monitor concentrations of particulate matter with an aerodynamic diameter of less than 10 µm (PM_{10}). Previous annual mean concentrations monitored at Kilkitt (published on the EPA website[9]) are presented in **Table 8-3** below.

Table 8-3
Background PM_{10} Concentrations

Year	Annual Mean (µg/m^3)	Number of Days >50 µg/m^3
2014	9	2
2015	9	1
2016	8.1	0
2017	7.8	0
2018	9	0
2019	7	1
2020	8.0	0
2021	7.8	0
2022	8.5	0

[9] Secure Archive for Environmental Research Data – http://erc.epa.ie/safer/.

8.60 **Table 8-3** illustrates that PM_{10} concentrations monitored at the Kilkitt monitoring site are below the annual mean Air Quality Standards (AQS) of 40 µg/m^3 and comply with the requirement that a 24-hour mean of 50 µg/m^3 should not be exceeded more than 35 times in a calendar year.

8.61 For rural areas, such as those surrounding the application site, the primary source of PM_{10} would be residential solid fuel emissions and local agricultural or rural based activities for deposited dust.

Field Survey / Monitoring / Inspection Works

8.62 Dust deposition surveys were undertaken at and around the application site for the periods between February and July 2019; March and May 2024; refer to **Figure 8-1** for monitoring locations. The dust deposition monitoring results recorded over this period are reviewed as part of this assessment. A survey of the extent of existing residential housing around the application site was also undertaken.

8.63 The locations of the baseline dust deposition monitors are shown on **Figure 8-1**:

- Location **D1** – to the southeast of the sand and gravel extraction area;
- Location **D2** – to the northeast of the sand and gravel extraction area;
- Location **D3** – to the northwest of the sand and gravel extraction area;
- Location **D4** – to the southwest of the sand and gravel application area; and
- Location **D5** – adjacent to the existing Kilsaran concrete batching facility.

Dust Deposition Monitoring

8.64 The results of the dust deposition monitoring are presented in **Table 8-4** below.

Table 8-4
Dust Deposition Monitoring Results

Monitoring Period	D1 (mg/m^2/day)	D2 (mg/m^2/day)	D3 (mg/m^2/day)	D4 (mg/m^2/day)	D5 (mg/m^2/day)
14/02/19 to 11/03/19	117	62	57	66	-
11/03/19 to 08/04/19	64	309	64	38	-
08/04/19 to 14/05/19	231	71	64	70	-
14/05/19 to 12/06/19	124	106	118	64	-
12/06/19 to 09/07/19	*	123	69	77	-
09/07/19 to 12/08/19	207	130	480	77	-
30/03/23 to 26/04/23	94	79	63	54	199
26/04/23 to 22/05/23	124	2355	291	155	108
22/05/23 to 29/06/23	88	90	51	101	168
29/06/23 to 26/07/23	91	*	124	232	54
26/07/23 to 23/08/23	269	122	332	440	356
23/08/23 to 21/09/23	132	31	101	57	290
21/09/23 to 16/10/23	77	47	193	2554	245
16/10/23 to 17/11/23	123	259	128	78	181

Monitoring Period	D1 (mg/m²/day)	D2 (mg/m²/day)	D3 (mg/m²/day)	D4 (mg/m²/day)	D5 (mg/m²/day)
17/11/23 to 15/12/23	67	42	64	42	82
15/12/23 to 15/01/24	102	61	94	90	148
15/01/24 to 19/02/24	80	59	72	52	121
19/02/24 to 19/03/24	95	119	245	212	345
19/03/24 to 18/04/24	62	68	304	77	160
18/04/24 to 14/05/24	75	38	231	14	121
* Broken or Missing Dust Jar					

8.65 As is noted from **Table 8-3**, most recorded baseline dust deposition rates at the site are low and generally well below 350 mg/m²/day, with the exception of five occasions:

- D3 Jul/Aug 2019;
- D2 Apr/May 2023;
- D4 Jul/Aug and Sep/Oct 2023; and
- D5 July/Aug 2023.

8.66 The periodic exceedances at locations D2 to D4 are likely due to seasonal agricultural activities such as ploughing and harvesting as there are no other dust sources in the immediate vicinity of the monitoring stations. These types of agricultural activities are commonplace in rural Ireland and are typical of the Irish countryside. There was only one slight exceedance at D5 during the monitoring period and it should be recognised that the location of D5 is at a shared entrance to both the readymix concrete plant and the neighbouring waste recovery/landfill operations. A further contributor to the elevated reading could be traffic generated dust on the adjacent public road.

Meteorology: Dispersion of Emissions

8.67 The most important climatological parameters governing the atmospheric dispersion of particles are as follows:

- **wind direction** determines the broad transport of the emission and the sector of the compass into which the emission is dispersed; and
- **wind speed** will affect ground level emissions by increasing the initial dilution of particles in the emission. It will also affect the potential for dust entrainment.

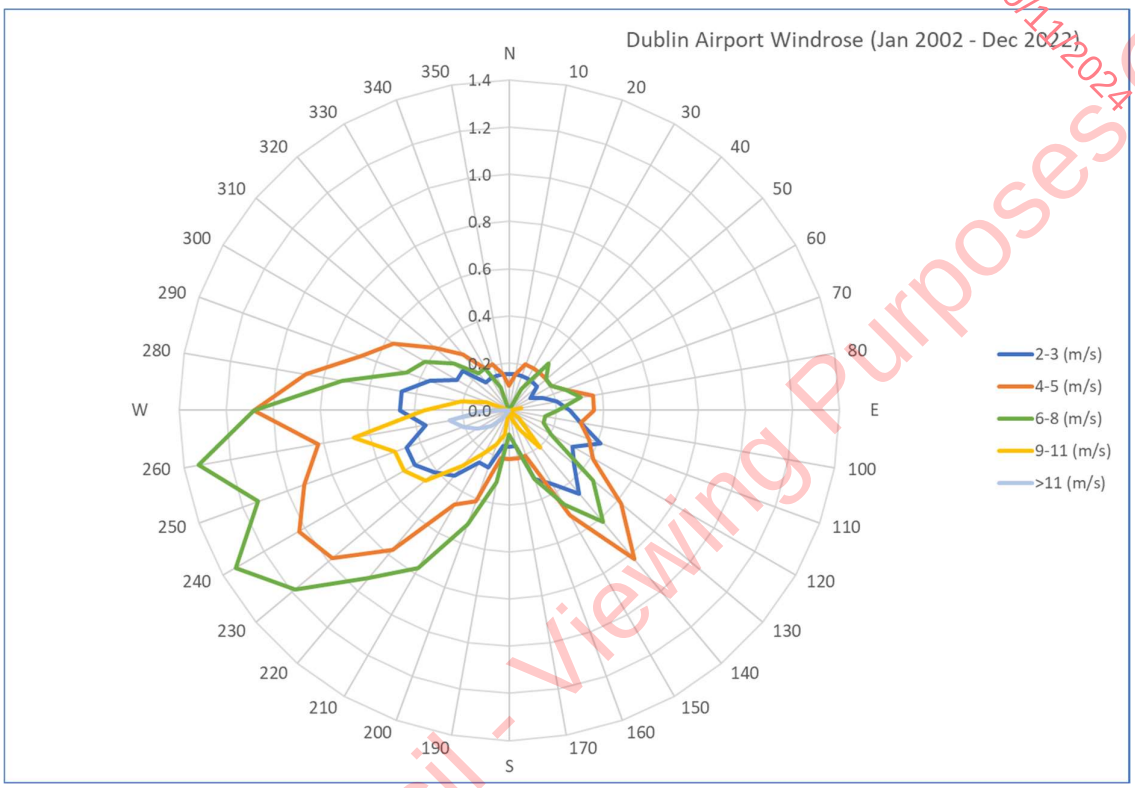
8.68 Rainfall is also an important climatological parameter in the generation of dust; enough rainfall can suppress dust at the source and eliminate the pathway to the receptor. According to Arup (1995) rainfall greater than 0.2 mm per day is sufficient to suppress dust emissions.

Local Wind Speed and Direction Data

8.69 A weather station with sufficient records of wind direction and wind speed considered representative of conditions experienced at the application site is Dublin Airport Meteorological Station. A windrose for the average conditions recorded at Dublin Airport over a twenty-year period from 2002 - 2022 is presented in **Plate 8-1**. The predominant wind direction is from the south-western quadrant with the

annual incidence of winds between 200° and 280° being 52.8%. Moderate to high-speed winds (>2 m/s) occur for approximately 94% of the time.

Plate 8-1
Windrose for Dublin Airport Meteorology Station



Rainfall Data

8.70 Relevant rainfall data applicable to the overall site has been obtained from the Irish Meteorological Service website for the Dublin Airport Metrological Station, located approximately 18 km south of the application site. The annual average days with rainfall greater than 0.2 mm is 191 days per year. Natural dust suppression (from rainfall) is therefore considered to be effective for 52% of the year.

Sensitive Receptors

Ecological Receptors

8.71 The application site is not subject to any statutory nature conservation designation.

8.72 Based on the nature, size, and scale of the planned development, it is considered that the maximum distance for which the project should be evaluated in terms of Natura 2000 and designated sites is up to a maximum radius of 2 km from the application site unless there are any potential source-pathway-receptor links between the proposed development at Naul and any Natura 2000 and designated site(s) beyond this distance. The distance is considered conservative for this type of development, as the

IAQM mineral dust guidance[10] notes that dust impacts tend to occur mainly up to 400m of an operation and the level of dust likely to lead to a change in vegetation is very high at over 1,000mg/m²/day.

8.73 At a distance greater than 2 km, and in the absence of any potential source-pathway-receptor link, it is considered that no Natura 2000 and designated sites would be affected by any direct loss of habitat or impacted upon by the effects of dust.

Human Receptors

8.74 Sensitive locations are those where people may be exposed to dust from existing or planned activities. Locations with a high sensitivity to dust include hospitals and clinics, hi-tech industries, painting and furnishing and food processing. Locations classed as being moderately sensitive include schools, residential areas, and food retailers.

8.75 Receptors have been identified within a 1km distance of the application site boundary at Naul as shown in **Figure 8-1**. Of these, the receptors within 500m of the application site are listed in **Table 8-5**. As residences are clustered in some areas, receptors have been identified at the nearest location to the application site boundary.

8.76 The analysis has been separated into two, with the sand and gravel pit forming one dust receptor analysis; and the site entrance application area and the existing permitted concrete batching facility being the other as receptors R1 – R27 & R47 fall outside the 500 m boundary for the sand and gravel pit and receptors R32 – R46 fall outside the 500 m boundary for the entrance/existing batching plant area. The road joining the two is considered trackout.

8.77 There are c. 47 sensitive receptors (residence and non-residence) identified within 500m of the proposed sand and gravel extraction area (red line application area) and the existing permitted Kilsaran concrete batching facility to which the sand and gravel will supply, see **Table 8-5**.

Table 8-5
Sensitive Receptors within the 500m of the Application Area

Receptor Reference	Receptor	Dust Sensitivity	Approx. Distance (m) / Direction from Sand & Gravel Extraction Site (Red Line Boundary)	Approx. Distance (m) / Direction from Site Entrance / Existing Kilsaran Batching Plant
R1	Residential	Medium	>500 (NE)	500 (N)
R2	Residential	Medium	>500 (NE)	450 (N)
R3	Residential	Medium	>500 (NE)	320 (N)
R4	Residential	Medium	>500 (NE)	310 (N)
R5	Residential	Medium	>500 (NE)	350 (N)
R6	Residential	Medium	>500 (E)	165 (N)
R7	Residential	Medium	>500 (E)	160 (N)
R8	Residential	Medium	>500 (E)	130 (N)
R9	Residential	Medium	>500 (E)	60 (N)
R10	Residential	Medium	>500 (E)	75 (N)
R11	Residential	Medium	>500 (E)	75 (N)

[10] https://iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf

Receptor Reference	Receptor	Dust Sensitivity	Approx. Distance (m) / Direction from Sand & Gravel Extraction Site (Red Line Boundary)	Approx. Distance (m) / Direction from Site Entrance / Existing Kilsaran Batching Plant
R12	Residential	Medium	>500 (E)	0 (S)
R13	Residential	Medium	>500 (E)	0 (S)
R14	Residential	Medium	>500 (E)	20 (S)
R15	Residential	Medium	>500 (E)	315 (SE)
R16	Residential	Medium	>500 (E)	210 (SE)
R17	Residential	Medium	>500 (E)	220 (SE)
R18	Residential	Medium	>500 (E)	200 (SE)
R19	Residential	Medium	>500 (E)	150 (SE)
R20	Residential	Medium	>500 (E)	140 (S)
R21	Residential	Medium	>500 (E)	180 (S)
R22	Residential	Medium	>500 (E)	190 (S)
R23	Residential *(Housing Development c. 80 residences)*	Medium	>500 (E)	245 (S)
R24	Residential	Medium	>500 (SE)	285 (S)
R25	Amenity (GAA Pitch)	Medium	>500 (SE)	320 (SW)
R26	Educational (Montessori / Pre-school)	Medium	>500 (SE)	215 (SW)
R27	Residential *(Housing Development c. 11 residences)*	Medium	>500 (SE)	130 (S)
R28	Residential	Medium	415 (SE)	170 (SW)
R29	Residential	Medium	430 (SE)	205 (SW)
R30	Residential	Medium	370 (SE)	315 (SW)
R31	Residential	Medium	410 (SE)	455 (SW)
R32	Residential	Medium	465 (S)	>500 (SW)
R33	Residential	Medium	395 (S)	>500 (SW)
R34	Residential	Medium	425 (S)	>500 (SW)
R35	Residential	Medium	435 (S)	>500 (SW)
R36	Residential	Medium	455 (S)	>500 (SW)
R37	Residential	Medium	455 (SW)	>500 (SW)
R38	Residential	Medium	250 (W)	>500 (W)
R39	Residential	Medium	220 (W)	>500 (W)
R40	Residential	Medium	240 (W)	>500 (W)
R41	Residential	Medium	295 (W)	>500 (W)
R42	Residential	Medium	320 (W)	>500 (W)
R43	Residential	Medium	320 (W)	>500 (W)

Receptor Reference	Receptor	Dust Sensitivity	Approx. Distance (m) / Direction from Sand & Gravel Extraction Site (Red Line Boundary)	Approx. Distance (m) / Direction from Site Entrance / Existing Kilsaran Batching Plant
R44	Residential	Medium	365 (W)	>500 (W)
R45	Residential	Medium	445 (NW)	>500 (NW)
R46 –	Residential	Medium	315 (SW)	>500 (SW)
R47 –	Residential	Medium	>500 (SE)	195 (SE)
Grey shading	= receptors ≤ 500m : used in assessment			
No shading	= receptors ≥ 500m : excluded			

IMPACT ASSESSMENT - METHODOLOGY

Evaluation Methodology

8.78 Fugitive dust emissions and particulate matter arising from the application site activities has the potential to affect existing sensitive receptors in the area due to a potential increase in airborne dust deposition.

8.79 Increased combustion emissions (primarily oxides of nitrogen) from vehicle exhaust emissions associated with the proposed sand and gravel extraction activities also have the potential to contribute to local air pollution.

8.80 The significance of impacts due to emissions from the application site are dependent upon the magnitude of the emissions, the prevailing meteorological conditions for the location, and the proximity of sensitive locations to the emission sources.

8.81 The impact assessment is based upon a comparison of the baseline (both current and projected without the development proposals) situation against the air quality impacts resulting from the 'with development' proposal scenario. The potential for 'in-combination' effects from other planned or proposed sources or air pollutants in the area has also been considered.

8.82 Each of the activities associated with extraction development have been assessed for potential air quality impacts including:

- emission from preparatory works, stripping, placement and stockpiling of soil (earthworks and trackout);
- emissions from sand and gravel extraction and processing;
- emissions from material stockpiling, placement, and restoration;
- PM_{10} contribution from operational activities; and
- traffic exhaust emissions.

8.83 The methodology used in each assessment is presented in the sub-sections below which also provide an explanation of the significance criteria to describe the impacts of the proposed development on air quality.

8.84 For the purposes of environmental assessment of releases of dust from construction and mineral activities, the classifications of PM_{10} and 'deposited dust' are typically applied. The impacts

associated with PM_{10} are related to potential health impacts while deposited dust is related to potential nuisance effects. The assessment of the potential impacts of each fraction has, therefore, been undertaken separately.

Significance Criteria

8.85 The following air quality specific significance criteria have been used to assess the significance of air quality impacts in preference to overall descriptors of significance.

8.86 To determine the significance of particulate matter effects associated with the development, an evaluation of the sensitivity of the surrounding area is required. Receptors can demonstrate different sensitivities to changes in environment and are classified as per **Table 8-6** below (and IAQM Construction Dust Guidance[11]).

Table 8-6
Methodology for Defining Sensitivity to Dust and PM_{10} Effects

Sensitivity of Area	Examples	
	Human Receptors	Ecological Receptors[(a)]
Very High	Very densely populated area More than 100 dwellings within 20 m Local annual mean PM_{10} concentrations exceed the Objective. Works continuing in one area of the site for more than 1-year	European Designated sites
High	Densely populated area. 10-100 dwellings within 20 m of site. Local annual mean PM_{10} concentrations close to the Objective (36 – 40 µg/m^3)	Nationally Designated sites
Medium	Suburban or edge of town Less than 10 receptors within 20 m Local annual mean PM_{10} concentrations below the Objective (30 – 36 µg/m^3)	Locally designated sites
Low	Rural area; industrial area No receptors within 20 m Local annual mean PM_{10} concentrations well below the Objective (<30 µg/m^3) Wooded area between site and receptors	No designations
Notes: (a) Only applicable if ecological habitats are present which may be sensitive to dust effects.		

8.87 **Table 8-7** illustrates how the interaction of magnitude and sensitivity results in the significance of an environmental effect, with the application of mitigation measures as per the IAQM Construction Dust Guidance.

Table 8-7
Impact Significance Matrix – Dust Effects (With Mitigation)

[11] http://www.iaqm.co.uk/text/guidance/mineralsguidance_2016.pdf

Sensitivity of Surrounding Area	Risk of Site Giving Rise to Dust or PM_{10} Effects		
	High	Medium	Low
Very High	Slight Adverse	Slight Adverse	Negligible
High	Slight Adverse	Negligible	Negligible
Medium	Negligible	Negligible	Negligible
Low	Negligible	Negligible	Negligible

Soil Stripping, Placement and Restoration - Methodology

8.88 The Institute of Air Quality Management (IAQM) assessment of risk is determined by considering the predicted change in conditions because of the proposed development. The risk category for potential effects arising from site works is divided into the following potential activities:

- earthworks;
- HGV traffic egress (trackout)

8.89 Based on the scale and nature of the works including areas, soils and operations at the site, a dust emission class is defined for each of the activities. These dust emission classes are then used to determine the risk categories presented below. These risk categories determine the potential risk of dust soiling effects assuming no mitigation measures are applied.

8.90 **Table 8-8** illustrates how the interaction of distance to the nearest receptor and the dust emission class results in the determination of risk category from *earthworks activities*.

Table 8-8
Determination of Risk Category from Earthworks Activities

Distance to Nearest Receptor		Dust Emission Class		
Human (m)	Ecological (m)	Large	Medium	Small
<20	-	High Risk Site	High Risk Site	Medium Risk Site
20 – 50	-	High Risk Site	Medium Risk Site	Low Risk Site
50 – 100	<20	Medium Risk Site	Medium Risk Site	Low Risk Site
100 – 200	20 – 40	Medium Risk Site	Low Risk Site	Negligible
200 – 350	40 – 100	Low Risk Site	Low Risk Site	Negligible

8.91 **Table 8-9** illustrates how the interaction of distance to the nearest receptor and the dust emission class results in the determination of risk category from *trackout movements*.

Table 8-9
Determination of Risk Category from Trackout Movements

Distance to Nearest Receptor		Dust Emission Class		
Human (m)	Ecological (m)	Large	Medium	Small
<20	-	High Risk Site	Medium Risk Site	Medium Risk Site
20 – 50	<20	Medium Risk Site	Medium Risk Site	Low Risk Site

Distance to Nearest Receptor		Dust Emission Class		
Human (m)	Ecological (m)	Large	Medium	Small
50 – 100	20 – 100	Low Risk Site	Low Risk Site	Negligible

8.92 Mitigation measures are recommended based on the evaluation of risk in accordance with the IAQM Dust and Air Emissions Mitigation Measures Guidance.

Sand & Gravel Extraction - Methodology

8.93 A staged approach has been adopted to the assessment of operations stage impacts generated by the proposed development (i.e. sand & gravel extraction and processing). This ensures that the approach taken for the assessment of risk is proportional to the risk of an unacceptable impact being caused. As such, where a simple review of the situation shows that risk of a health or nuisance impact is negligible, this will be sufficient. In cases where the risk cannot be regarded as insignificant, a more detailed assessment may be required, such as a quantitative screening assessment or an advanced dispersion modelling exercise as appropriate.

8.94 Guidance on the assessment of the impacts of extractive operations on air quality has been prepared by the Institute of Air Quality Management (IAQM). This guidance uses a simple distance-based screening process to identify those operations where the dust impacts are unlikely to be significant and therefore require no further assessment. Where assessment that is more detailed is required, a basic assessment framework is presented which employs the Source-Pathway-Receptor approach to evaluate risk of impacts and effects.

8.95 The predicted scale of dust effects may be classified as either 'significant', or 'not significant'. Where effects are predicted to be 'significant', further mitigation is likely required before the proposals are to be acceptable under planning policy.

8.96 A semi-quantitative assessment of fugitive dust emissions from the proposed development has been undertaken. The assessment has been undertaken by constructing a conceptual model that takes into consideration the potential sources, surrounding receptors, and the pathway between source and receptor to assess the magnitude of risk of impact on local amenities.

8.97 The distance from the source to the sensitive receptor is crucial. The initial risk screening stage (Tier 1) focuses upon the potential for dust generation at the site and the distance between source and receptors. In Tier 1 of the assessment, a representative selection of dust sensitive receptors in each direction of the application site is identified within 1 km of the study area.

8.98 Further assessment is required for those receptors within 500m of dust generating activities. Receptors within 500m of dust generating processes progress onto a Tier 2 assessment.

8.99 Tier 2 involves identifying source-pathway-receptor linkages and a semi-quantitative assessment of the likelihood and magnitude of any effects that could be associated with each pollutant linkage. This assessment takes account of:

- wind direction and speed data (to estimate frequency of exposure);
- proximity to source (to estimate magnitude of exposure);
- sensitivity of receptor; and
- occurrence of natural dust suppression (rainfall patterns).

8.100 This information is used to inform a semi-quantitative assessment of the likely magnitude of impact and is based upon professional experience of the assessor as the issue of dust nuisance on local

receptors is a subjective issue, where public perception on what constitutes 'acceptable' levels varies from one person to the next. Assigning significance to nuisance impacts is qualitative and involves a judgement based on the likely magnitude, frequency, duration, and reversibility (or recovery) of the impact. In this context, significant impact is taken to mean what is generally not publicly acceptable and desirable.

8.101 Note that the Tier 2 risk screening assessment **does not consider proposed mitigation measures** to be implemented at the proposed development. These will include provision of perimeter screening berms, dust suppression measures etc., refer to the section dealing with Mitigation Measures later in this chapter.

8.102 Following the results of the risk assessment, mitigation measures are detailed, and the residual impact assessed. The detailed methodology used within the assessment is described in **Appendix 8-A**.

PM_{10} Contribution from Extraction Activities - Methodology

8.103 In terms of whether the PM_{10} concentration in the local area is likely to exceed the AQS, the following information has been reviewed:

- existing PM_{10} concentrations; and
- expected additional contribution of PM_{10} from site operations.

8.104 In terms of estimating the potential magnitude of impact from site operations, a UK edition of the LAQM Technical Guidance (LAQM.TG(03)) stated that fugitive dust from stockpiles, quarry operations can potentially contribute up to 5 µg/m^3 towards annual mean background concentrations of the coarse fraction (2.5 – 10 µm diameters) of particulates in the immediate area.

8.105 Given the nature and scale of the proposed activities, the potential PM_{10} impact of increased intake is similar or lower. However, to ensure a robust assessment of potential PM_{10} impacts, the upper limit of 5 µg/m^3 has been applied to represent the development contribution to annual ambient PM_{10} concentrations. This value has then been added to existing background levels to assess whether the Air Quality Standards objective is likely to be exceeded.

Traffic Emissions - Methodology

8.106 Atmospheric emissions related to site proposals are primarily associated with the exhaust emissions from heavy duty vehicles (HDVs also termed heavy goods vehicles HGV's). The decision as to whether an assessment of potential impact is required is based upon the criteria set out in the DMRB (Design Manual for Roads and Bridges).

8.107 The criterion for assessment of air quality contained within the latest DMRB guidance (LA 105) focuses on roads with relatively high changes in flows or high proportion of HDV / HGV traffic. Affected roads are defined as those that meet any of the following criteria:

- road alignment will change by 5 m or more; or
- daily traffic flows will change by 1,000 Annual Average Daily Traffic (AADT) movements or more; or
- HDV / HGV flows will change by 200 AADT or more; or
- daily average speed will change by 10 km/hr or more; or
- peak hour speed will change by 20 km/hr or more.

8.108 The proposed development annual extraction rate will be ca. 120,000 tonnes of sand and gravel per year. Based on 249 working days per year[12], together with an average payload of 27 tonne, this will result in an average of 18 loaded aggregates haulage vehicles over the working day.

ASSESSMENT OF IMPACTS

Construction Stage: Soils Stripping, Placement and Restoration - Assessment

8.109 An overview of the sources and processes associated with the site preparatory works, soil stripping operations, and their respective potential for dust deposition (both dust and smaller particles) is presented below in **Table 8-10**.

Table 8-10
Site Activities: Sources of Dust Emissions

Activity	Source	Emission Potential	Comments
Earthworks and Trackout Activities	Excavators / Dozers / HGV	High - dry or fine materials during strong windy weather	Temporary, variable from day to day depending on prevailing meteorological conditions, level, and location of activity.
		Low – coarse or wet materials during conditions of low wind speed	
Construction works	Excavators / Dozers / HGV	High - dry or fine materials during strong windy weather	Temporary, variable from day to day depending on prevailing meteorological conditions, level, and location of activity.
Temporary stripping & placement work & restoration works	Excavators / HGV	High - dry or fine materials during strong windy weather	Temporary, variable from day to day depending on prevailing meteorological conditions, level, and location of activity. Soils placed directly into storage area or in progressive works.

8.110 During site preparatory works, earthworks, materials transfer, restoration works, and trackout will be largely confined within the application and given the proximity to receptors the dust risk category is 'low risk' to 'negligible'.

8.111 During the site stripping and restoration phases, given the limited number of vehicle movements and the limited length of off-road routes, the trackout dust risk category is 'negligible'.

8.112 A summary of the determined risk category for proposed operation identified is presented within **Table 8-11**.

Table 8-11
Site Activities: Risk of Dust Emissions

Source	Risk of Dust Soiling and PM_{10} Effects	Ecological Effects
Earthworks	Low Risk to Negligible	Negligible
Construction	Low Risk to Negligible	Negligible

[12] Refer to EIAR Chapter 14 Traffic: Section 14.51 for operational days rationale

Source	Risk of Dust Soiling and PM_{10} Effects	Ecological Effects
Trackout	Negligible	Negligible

8.113 While the overall risk category has been assessed as 'negligible, if the soils stripping activities were not mitigated, the effects of dust during dry and windy conditions could possibly lead to occasional increases in nuisance dust immediately surrounding the application area. However, these are not considered to be significant given the limited duration of such meteorological conditions, and the limited change in the extent and scale of the proposed activities.

Operational Stage: Sand & Gravel Extraction & Processing - Assessment

8.114 An overview of the sources and processes associated with the operational stage, and their respective potential for dust deposition, is presented below in **Table 8-12**.

Table 8-12
Sources of Particulate Emissions

Activity	Source	Emission Potential	Comments
Sand & Gravel transfer to processing area	Onsite vehicle, dry loose material.	High when dry material being handled during strong windy weather	Emissions due to prevailing meteorological conditions and amount of dry loose material. Emissions due to re-suspension of loose material on surfaces.
Processing of Sand & Gravel	Processing plant, wet material	Low due to damp material	Emissions due to prevailing meteorological conditions (high winds).
Material storage	Dry loose material in stockpiles	High when dry material being stored during strong windy weather	Emissions due to prevailing meteorological conditions (high winds).
Material Loading to HGV	Onsite vehicle, dry loose material	High when dry material being handled during strong windy weather	Emissions due to prevailing meteorological conditions and amount of dry loose material. Emissions due to re-suspension of loose material on surfaces.
Transfer to the site & traffic off site	HGV / Road vehicles	Low - on paved road surfaces	Dependant on the amount of loose material on road surface available for re-suspension and track out.

Human Receptors

8.115 Approximately 47 sensitive receptors were identified within the c. 500m of (one of the two) study area around the application site.

8.116 Using the tiered assessment methodology, all receptors located within 500m have progressed onto a Tier 2 assessment as they are considered to have a greater risk of dust impact. Each receptor identified in **Table 8-5** above is assessed against the frequency of exposure and the distance from the source to the receptor (i.e., the pathway). The methodology is described fully in **Appendix 8-A**.

8.117 The frequency of exposure of each receptor is based upon the frequency of winds capable of carrying dust particles blowing in the direction, from the source to the receptor, on days when rainfall does not inhibit dust from becoming airborne. Representative data on the local wind climate is therefore required for this section of the assessment.

8.118 A wind-rose for the site is presented in **Plate 8-1** for Dublin Airport Meteorological Station and illustrates the predominant wind directions from the south-west. The potential for the generation of airborne dust will increase with wind speed, with winds greater than 3m/s capable of carrying airborne dust[13].

8.119 The wind rose shows the frequency of winds at wind speeds of greater than 2 m/s with the individual frequencies for each 10-degree compass sector used within the assessment. In this assessment, wind speeds over 2 m/s were used; as this is how the data on percentage occurrence of wind frequency and wind speed is calculated and presented by Met Eireann.

For this reason, the impact assessment presented herein is considered to be conservative.

8.120 A summary of the risk assessment of dust impacts at the selected Tier 2 receptors / locations (i.e. locations within 500m) arising from the proposed development activities (**in the absence of any mitigation measures**) is presented in **Table 8-13** and **Table 8-14** below.

Table 8-13
Dust Risk Assessment Screening Sand and Gravel Pit (Without Mitigation Measures)

Receptor	Distance from Operations (m)	Relevant. Wind Direction [A]	Potential Exposure Duration [B]	Relative Wind / Distance Rank [C]	Risk Evaluation
R28	400	250 - 300	7.1	3x2 (6)	Insignificant
R29	420	260 -300	5.5	2x2 (4)	Insignificant
R30	370	260 - 310	6.0	2x3 (6)	Insignificant
R31	360	270 - 320	4.7	2x3 (6)	Insignificant
R32	465	320 - 10	1.2	1x2 (2)	Insignificant
R33	395	320 - 10	1.2	1x3 (3)	Insignificant
R34	425	330 - 10	0.9	1x2 (2)	Insignificant
R35	435	340 - 20	0.8	1x2 (2)	Insignificant
R36	455	340 - 20	0.8	1x2 (2)	Insignificant
R37	505	10 - 50	1.1	1x1 (1)	Insignificant
R38	250	10 - 80	2.1	1x4 (4)	Insignificant
R39	205	10 - 90	2.5	1x4 (4)	Insignificant
R40	220	20 - 100	2.7	1x4 (4)	Insignificant
R41	260	30 - 110	3.0	1x4 (4)	Insignificant
R42	270	30 - 110	3.0	1x3 (3)	Insignificant
R43	285	40 - 120	3.2	2x3 (6)	Insignificant
R44	365	60 - 130	3.3	2x3 (6)	Insignificant
R45	445	80 - 130	2.8	1x2 (2)	Insignificant
R46	315	0-50	1.2	1x3 (3)	Insignificant

[13] Department of the Environment, Transport and the Regions, 1995. *The Environmental Effects of Dust from Surface Mineral Workings* – Volume 2. Technical Report. December 1995.

Table 8-14
Dust Risk Assessment Screening Site Entrance/Existing Concrete Batching Plant (Without Mitigation Measures)

Receptor	Distance from Operations (m)	Relevant. Wind Direction [A]	Potential Exposure Duration [B]	Relative Wind / Distance Rank [C]	Risk Evaluation
R1	500	150 - 160	1.1	1x1 (1)	Insignificant
R2	450	150 - 160	1.1	1x2 (2)	Insignificant
R3	320	150 - 170	1.3	1x3 (3)	Insignificant
R4	310	150 - 170	1.3	1x3 (3)	Insignificant
R5	350	140 - 160	2.1	1x3 (3)	Insignificant
R6	165	150 - 180	1.6	1x5 (5)	Insignificant
R7	160	130 - 160	2.8	1x5 (5)	Insignificant
R8	130	120 - 160	3.2	2x5 (10)	Acceptable
R9	60	110 - 150	3.3	2x8 (16)	Slight Adverse
R10	75	130 - 180	3.3	2x8 (16)	Slight Adverse
R11	75	80 - 130	2.8	1x8 (8)	Acceptable
R12	0	300 - 210	11.0	2x8 (16)	Slight Adverse
R13	0	340 - 110	3.8	2x8 (16)	Slight Adverse
R14	20	350 - 90	2.8	1x8 (8)	Acceptable
R15	315	270 - 290	3.3	2x3 (6)	Insignificant
R16	210	270 - 290	3.3	2x4 (8)	Acceptable
R17	220	280 - 300	2.4	1x4 (4)	Insignificant
R18	200	290 - 310	1.8	1x4 (4)	Insignificant
R19	150	300 - 320	1.4	1x5 (5)	Insignificant
R20	140	310 - 330	1.1	1x5 (5)	Insignificant
R21	180	320 - 350	1.0	1x5 (5)	Insignificant
R22	190	330 - 360	0.8	1x5 (5)	Insignificant
R23	245	310 - 330	1.0	1x4 (4)	Insignificant
R24	285	350 - 20	0.6	1x4 (4)	Insignificant

Receptor	Distance from Operations (m)	Relevant. Wind Direction (A)	Potential Exposure Duration (B)	Relative Wind / Distance Rank (C)	Risk Evaluation
R25	320	10 - 40	0.8	1x3 (3)	Insignificant
R26	215	360 - 30	0.7	1x4 (4)	Insignificant
R27	130	360 - 50	1.2	1x5 (5)	Insignificant
R28	170	30 - 70	1.3	1x5 (5)	Insignificant
R29	205	20 - 60	1.2	1x4 (4)	Insignificant
R30	315	30 - 60	1.0	1x3 (3)	Insignificant
R31	455	30 - 50	0.8	1x2 (2)	Insignificant
R47	195	10 - 50	1.1	1x5 (5)	Insignificant

Table Note:

(**A**) – relevant wind direction based on upwind sector which would potentially convey from site towards the receptor.

(**B**) – Potential duration of exposure based on frequency of moderate to high wind speed (adjusted for dry days only) as described in the methodology in **Appendix 8-A**.

(**C**) – Ranking as per methodology in **Appendix 8-A**

Refer to **Figure 8-1** for Receptor Locations

8.121 It can be seen from **Table 8-13** and **Table 8-14** that the risk of impact associated with dust deposition is highest at receptors located to the north of the application area or within a proximity to the west. Dust receptors R9, R10, R12, and R13 were evaluated to be slight adverse. All other receptors evaluated in both assessments are expected to have either an acceptable or insignificant of deposited dust impacts.

8.122 The assessment does not consider the mitigating effects of dust control measures implemented during the operations or the effective barrier created by the vegetation along the local hedgerows (which will be retained) and any screening berms. The effectiveness of the vegetation belt as both a windbreak in reducing the momentum of the incident wind and as a surface for the capture of airborne particles is considered to significantly reduce the generation of airborne dust beyond the site development boundary.

8.123 Details of dust mitigation measures to reduce dust deposition impact levels at receptors to levels of 'lower risk' are described in the 'Mitigation' section of this chapter.

Ecological Receptors

8.124 The application site is not subject to any statutory nature conservation designation.

8.125 Based on the nature, size, and scale of the planned activity at Naul, it is considered that the maximum distance for which the project should be evaluated in terms of Natura 2000 sites is up to a maximum radius of 2 km from the application site, unless there are any potential source-pathway-receptor links between it and any Natura 2000 site(s) beyond this distance.

8.126 Fugitive dust from quarry/pit sites is typically deposited within 100 to 200 m of the source; the greatest proportion of which, comprising larger particles (greater than 30 microns) is deposited within 100 m. Where large amounts of dust are deposited on vegetation over a long timescale (a full growing season for example) there may be some adverse effects upon plants restricting photosynthesis, respiration, and transpiration.

8.127 The EPA environmental management guidelines for the sector recommend a limit of 350 mg/m^2/day (averaged over a thirty-day period) for dust deposition at the site boundary. A programme of dust deposition monitoring at the application site indicates that the levels of dust are below the recommended limit levels and well below the level of 1000 mg/m^2/day, where it is considered that dust could be likely to have a significant effect on sensitive ecosystems.

8.128 Based on the above, it is concluded that operations at the application area have had and will have insignificant dust deposition impact on ecological receptors.

Traffic Emissions - Assessment

8.129 For the purposes of assessment, the projected traffic movements associated with the development will result in an average of 18 loaded aggregates haulage vehicles over the working day.

8.130 Therefore, as none of the roads in the surrounding local road network meet any of the traffic / alignment criteria set out in HA 207/07, then the impact of the scheme can be 'negligible' in terms of local air quality and no further air quality assessment is deemed necessary.

8.131 On this basis, the impact of the proposed pit can be screened out and combustion emissions (primarily oxides of nitrogen) from vehicle exhaust emissions associated with the transportation of materials will not have the potential to contribute to local air pollution.

PM_{10} Contribution from Quarry Activities - Assessment

8.132 In terms of PM_{10}, the maximum annual mean measured baseline background concentration was 9 µg/m^3 in 2014, 2015, and 2018 at the Kilkitt, Co. Monaghan monitoring station. Therefore, the potential contribution up of 5 µg/m^3 towards annual mean background concentrations of the coarse fraction (2.5 – 10 µm diameters) of particulates (in the immediate area of the site) is insignificant and well below the annual objective of 40 µg/m^3.

8.133 Therefore, the potential impacts in relation to increase in ambient PM_{10} concentrations can be classified as 'negligible' when the limited duration of conditions and the magnitude of change in the extent and scale of activities are considered to significantly reduce the generation of airborne PM_{10} beyond the site development boundary.

Unplanned Events (i.e., Accidents)

8.134 Accidents, malfunctions, and unplanned events refers to events or upset conditions that are not part of any activity or normal operation of the proposed extraction as has been planned by Kilsaran. Even with the best planning and the implementation of preventative measures, the potential exists for accidents, malfunctions, or unplanned events to occur during sand and gravel extraction activities.

8.135 Many accidents, malfunctions and unplanned events are, however, preventable and can be readily addressed or prevented by good planning, design, emergency response planning, and mitigation.

8.136 Considering the sand and gravel extraction activities, there is no need to use any warning sirens or warning sounds in relation to unplanned events.

8.137 In terms of air quality impacts the following unplanned events could influence the local area:

- equipment malfunction;
- vehicle collision;
- dry and windy weather conditions with dust suppression equipment malfunction;
- accidental material spillages during transport.

8.138 If unplanned events were not mitigated, the effects of dust during dry and windy conditions could possibly lead to occasional increases in nuisance dust and 24-hour mean PM_{10} concentration immediately surrounding the sand and gravel extraction area and access road. However, these are not considered to be significant given the limited duration of such meteorological conditions and the limited scale of activities.

Cumulative / Synergistic Impacts

8.139 In essence, cumulative impacts are those which result from incremental changes caused by other past, present or reasonably foreseeable actions together with the proposed development. Therefore, the potential impacts of the proposed development cannot be considered in isolation but must be considered in addition to impacts already arising from existing or planned development.

8.140 There is an existing permitted concrete batching facility with all aggregates delivered to the facility from other sites carried in HGVs and/or articulated trucks which travel through existing roads and junctions within the Naul village.

8.141 Aggregate extraction at the proposed sand and gravel pit will reduce the number of the HGVs and/or articulated trucks which will travel through the village as the haulage of aggregates from other sites operated by Kilsaran can be eliminated. This can be deemed as a positive impact on the sensitive receptors.

8.142 Local existing and planned developments were reviewed as part of this assessment. The review shows a permitted C&D facility (P. Ref. 180893) adjacent to the existing concrete batching facility, subject to a grant of licence by the EPA. As the operation is now functional and a waste licence has been granted by the EPA, it can be considered that the project is accounted for within the baseline assessments undertaken.

8.143 At present air quality monitoring shows that there are no exceedances of the Air Quality Objectives at any location in the study area, including at monitoring location D5 adjacent to the existing operational concrete batching facility and third party C&D facility.

8.144 This assessment shows that the proposed development at Naul will not have the potential to contribute to local air pollution. The cumulative effects of both developments if not mitigated, in dry and windy conditions could possibly lead to occasional increases in nuisance dust and 24-hour mean PM_{10} concentration immediately surrounding the area. However, these are not considered to be significant given the limited duration of such meteorological conditions and the limited scale of construction activities.

Interaction with Other Impacts

8.145 The potential impact on air quality by the project on sensitive receptors including sensitive ecological receptors and people living in the area has been fully assessed in this chapter. The overall impact of the project on these receptors is further considered in Chapter 4 Population and Human Health and Chapter 5 Biodiversity.

MITIGATION MEASURES

8.146 A range of mitigation measures are recommended for implementation at the proposed site at Naul.

Soil Stripping, Construction & Restoration Activities

8.147 Specific mitigation measures are listed in **Table 8–15**

Table 8-15
Soil Stripping & Restoration Activities – Particulate Emission Mitigation Measures

Source	Emission Potential	Recommended Mitigation Measures	Effectiveness
Excavator/HGV	High – dry or fine silty material during strong windy weather	Minimise drop heights when handling material. Materials placed directly into screening storage area or in progressive works. Avoid working in adverse/ windy conditions.	High
	Low – soils of high moisture content during conditions of low wind speed	Minimise drop heights when handling material, protection from wind where possible.	High

Sand and Gravel Processing

8.148 Kilsaran will implement the mitigation measures outlined in **Table 8-16** to reduce particulate matter emissions during sand and gravel extraction and processing. It should be acknowledged that the processing proposed is washing which is by its nature a wet process. The washed resultant aggregates maintain a certain moisture content within the stockpiles which assists in reducing fugitive dust.

Table 8-16
Sand and Gravel Extraction and Processing – Particulate Emission Mitigation Measures

Source	Emission Potential	Recommended Mitigation Measures	Effectiveness
Excavators / HGV Loading	High – dry material during strong windy weather	Minimise drop heights when handling material. Water sprays to moisten handled material.	High
	Low – wet material during conditions of low wind speed	Minimise drop heights when handling material, protection from wind where possible.	High
	High when travelling over un-surfaced and dry site roads.	Minimise distances of onsite haul routes.	High
Onsite Vehicles	High when travelling over un-surfaced and dry site roads. Low / Moderate on paved road surfaces	Use of water sprays / tractor & bowser to moisten surfaces during dry weather.	High
		Restrict vehicle speeds through signage / staff training.	High
		Location of haul routes away from sensitive receptors.	High
		Use of road sweeper to reduce the amount of available material for re-suspension.	Moderate / High
	Low / Moderate on paved road surfaces	Pave the access road.	High

Source	Emission Potential	Recommended Mitigation Measures	Effectiveness
Road Vehicles (transfer offsite)	High when dry or fine material being stored or handled during strong windy weather	Seed surfaces of completed mounds / bunds of topsoil.	High
Stockpiles	High when dry or fine material being stored or handled during strong windy weather	Limit mechanical disturbance.	High
		Avoid working in adverse weather conditions and faulty dust filters	High
Acceptable Risk Receptors Slight Adverse Risk Receptors	High – during dry and strong windy weather	Avoid working in adverse weather conditions	High High
		Retention of hedgerows	High
		Proposed perimeter berms	High

Trackout Measures

8.149 When adverse conditions apply (dry, windy weather), water from a bowser will be sprayed on dry unpaved road / track surfaces to minimize dust rise. Any paved surfaces around the site and/or along the access road leading in and out of the Sand and Gravel Pit will also be sprayed as required.

Good Practice Measures

8.150 Effective site management practices are critical to demonstrate the willingness of the operator to control dust emissions. Monitoring of dust deposition and recording of any complaints shall be carried out to take appropriate measures to reduce emissions in a timely manner.

8.151 Training on dust mitigation measures shall be provided to site-based staff. Training will also cover an 'emergency preparedness plan' to react quickly in case of any failure of dust mitigation measures.

8.152 A water bowser will be made available at required times to dampen down stockpiled / particulate materials and/or unpaved surfaces when adverse (dry, windy) conditions apply.

RESIDUAL IMPACT ASSESSMENT

8.153 With the range of mitigation measures to be implemented and design measures to be incorporated into the working scheme, it is considered that the risk of dust impact at receptors from the proposed development reduces further.

8.154 After an assessment of potential adverse effects produced by the development it was concluded that there would be no significant adverse air quality effects. Overall the effects of the proposed development on air quality have been considered to be insignificant to acceptable.

8.155 A summary of the residual dust risk impact assessment is provided in **Table 8-17**.

Table 8-17
Residual Dust Risk Assessment (With Mitigation Measures)

Receptor Reference	Risk Evaluation without Mitigation Measures	Risk Evaluation with Mitigation Measures
R1	Insignificant	Insignificant
R2	Insignificant	Insignificant

Receptor Reference	Risk Evaluation without Mitigation Measures	Risk Evaluation with Mitigation Measures
R3	Insignificant	Insignificant
R4	Insignificant	Insignificant
R5	Insignificant	Acceptable
R6	Insignificant	Acceptable
R7	Insignificant	Insignificant
R8	Acceptable	Insignificant
R9	Slight Adverse	Acceptable
R10	Slight Adverse	Acceptable
R11	Acceptable	Insignificant
R12	Slight Adverse	Acceptable
R13	Slight Adverse	Acceptable
R14	Acceptable	Insignificant
R15	Insignificant	Insignificant
R16	Acceptable	Insignificant
R17	Insignificant	Insignificant
R18	Insignificant	Insignificant
R19	Insignificant	Insignificant
R20	Insignificant	Insignificant
R21	Insignificant	Insignificant
R22	Insignificant	Insignificant
R23	Insignificant	Insignificant
R24	Insignificant	Insignificant
R25	Insignificant	Insignificant
R26	Insignificant	Insignificant
R27	Insignificant	Insignificant
R28	Insignificant	Insignificant
R29	Insignificant	Insignificant
R30	Insignificant	Insignificant
R31	Insignificant	Insignificant
R32	Insignificant	Insignificant
R33	Insignificant	Insignificant
R34	Insignificant	Insignificant
R35	Insignificant	Insignificant

Receptor Reference	Risk Evaluation without Mitigation Measures	Risk Evaluation with Mitigation Measures
R36	Insignificant	Insignificant
R37	Insignificant	Insignificant
R38	Insignificant	Insignificant
R39	Insignificant	Insignificant
R40	Insignificant	Insignificant
R41	Insignificant	Insignificant
R42	Insignificant	Insignificant
R43	Insignificant	Insignificant
R44	Insignificant	Insignificant
R45	Insignificant	Insignificant
R46	Insignificant	Insignificant
R47	Insignificant	Insignificant

8.156 Based on the assessment presented above, it is concluded that the proposed development, with the range of mitigation measures to be implemented and design measures incorporated into the working scheme, will not have a significant dust deposition impact on any assessed receptors.

MONITORING

8.157 Dust deposition monitoring will continue to be undertaken at the application site. Five monitoring locations were included in the baseline survey and will be monitoring for the duration of the development – refer to **Figure 8-1** for locations.

8.158 The dust monitoring gauges will be located close to emission sources or potentially sensitive receptors located beyond the site boundary. It is proposed that the dust monitoring stations will remain in place for the duration of extraction and processing operations at the site and be monitored on a monthly basis similar to Condition No. 4 of the planning permission ABP-314881-22 (P. Ref. 22/153) in relation to the existing Kilsaran concrete batching plant.

8.159 Dust monitoring locations shall be reviewed and revised where and as/when necessary. The results of the dust monitoring shall be submitted to Meath County Council on an annual basis for review and record purposes.

Appendices

Appendix 8-A

Dust Risk Screening Assessment Methodology

The methodology applied in the assessment is a semi-quantitative risk assessment methodology, in which the probability of an impact occurring and the magnitude of the impact, if it were to occur, are considered. This methodology is the Tier 2 assessment of the dust assessment methodology. In the event that identified dust sensitive receptors are not screened out within Tier 1, this approach provides a mechanism for identifying the areas where mitigation measures are required, and for identifying mitigation measures appropriate to the risk presented by the development, (i.e., the assessment does not take account of proposed mitigation being put in place).

The magnitude of the potential risk at each receptor is classified depending on the frequency of exposure and the distance from the site to the receptor. Frequency of exposure is represented by the percentage of moderate to high winds (over 3 m/s) from the direction of the site.

The screening assessment tool assesses the significance of the distance from site and the frequency of exposure of each receptor by assigning a ranked number. Receptors with a higher potential for dust impacts would therefore result in a higher value whilst receptors with lower potential would expect to carry a lower value. The value corresponding to an evaluation of risk is a product of the significance of the distance and frequency of exposure, each is assigned a value representing its significance. The multiplication of the two values assigned gives a total, which is then corresponded to a qualitative term of risk magnitude.

Frequency of Exposure Criterion

The potential for any site to emit dust is greatly influenced by weather. Increased wind speed increases the potential for the generation of airborne dust due to the suspension and entrainment of particles in airflow. A worst-case situation would be strong, warm, drying winds which increase the rate at which dust is lifted from an untreated surface and emitted into the air. Wind can also have the effect of spreading dust over a large area. Conversely, rainfall decreases dust emissions, due to both surface wetting and increasing the rate at which airborne dust is removed from air. An article on dust generation from quarry/pit operations[14] suggests that rainfall of greater than 0.2 mm per day is considered sufficient to effectively suppress windblown dust emissions.

The frequency of exposure to dust emissions represents the percentage of time that wind speeds capable of carrying airborne dust (greater than 3 m/s) are blowing from the site to the direction of the receptor. Frequencies are calculated based on meteorological data. For screening assessment wind speeds greater than 2 m/s were considered as this is how data on percentage occurrence of wind frequency and wind speed is calculated and presented by Met Eireann. For this reason, the assessment is considered to be conservative.

For the screening assessment, a value of 1 mm would be used for the criteria to classify days as 'dry' or 'wet'; five times the recommended value, using annual average rainfall data. The average number of days when rainfall exceeds 1 mm would be provided for each month and calculated over the year to provide an average.

The resulting frequency of moderate to high wind speeds with the potential of carrying airborne dust towards receptors would then be classified into the criteria in **Table 8 A-1** with the respective rank value assigned.

[14] Leeds University. Good Quarry. http://www.goodquarry.com/article.aspx?id=55&navid=2

Table 8 A-1
Frequency of Exposure – Risk Classification

Risk Category	Criteria
1	Frequency of winds (>2 m/s) from the direction of the dust source on dry days are less than 3%
2	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are between 3% and 6%
3	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are between 6% and 9%
4	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are between 9% and 12%
5	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are between 12% and 15%
6	The frequency of winds (>2 m/s) from the direction of the dust source on dry days are greater than 15%

Distance to Source Criterion

In assessing dust impacts, the distance from the source to the sensitive location is crucial, as airborne and deposited dust tend to settle out close to the emission source. Smaller dust particles remain airborne for longer, dispersing widely and depositing more slowly over a wider area.

Guidance indicates that larger dust particles (greater than 30 µm) will largely deposit within 100 m of sources. Smaller particles (less than 10 µm) are only deposited slowly. Concentrations decrease rapidly on moving away from the source, due to dispersion and dilution.

To allow for this effect of distance, buffer zones are often defined by mineral planning authorities around potentially dusty activities to ensure that sufficient protection is provided. They have not been established in any rigorous scientific way, but usually range from 50 m to 200 m. The 1995 UK DoE Guidance on dust from surface mineral working's, however, recommends a stand-off distance of 100 to 200 m from significant dust sources (excluding short-term sources), although it is recognised that these distances can be reduced if effective mitigation measures are identified and implemented. In terms of identifying sensitive locations therefore, and to represent an extreme worst-case scenario, consideration only needs to be given to sensitive receptors within 500 m of the site boundary. Receptors at a distance greater than 500 m have therefore been screened out in Tier 1 of the assessment.

The criteria for classifying the distance from receptor to source and thus assigning a rank value has therefore been based on the various references to dust behaviour described above. The rank classifications are presented below in **Table 8 A-2**. A risk category is maintained for receptors more than 500 m for circumstances where although a receptor is beyond 500 m from the dust source, its sensitivity for example is sufficient for it to be taken onto a Tier 2 assessment.

Table 8 A- 2
Distance to Source – Risk Classification

Risk Category	Criteria
1	Receptor is more than 500 m from the dust source
2	Receptor is between 400 m and 500 m from the dust source
3	Receptor is between 300 m and 400 m from the dust source
4	Receptor is between 200 m and 300 m from the dust source
5	Receptor is between 100 m and 200 m from the dust source
8	Receptor is less than 100 m from the dust source

Sensitivity of Receptors

Sensitive locations are those where the public may be exposed to dust from the site. Locations with a high sensitivity to dust include hospitals and clinics, hi-tech industries, painting and furnishing and food processing. Locations classed as being moderately sensitive include schools, residential areas, and food retailers. **Table 8 A-3** below[15] shows examples of dust sensitive facilities.

Table 8 A-3
Examples of Dust Sensitive Facilities

High Sensitivity	Medium Sensitivity	Low Sensitivity
Hospitals and clinics	Schools and residential areas	Farms
Retirement homes	Food retailers	Light and heavy industry
Hi-tech industries	Greenhouses and nurseries	Outdoor storage
Painting and furnishing	Horticultural land	
Food processing	Offices	

Evaluation of Risk

Once a rank value has been assigned to the frequency of exposure and distance to source, an overall risk can be evaluated by combining the two risk categories, along with consideration of the sensitivity of the receptor. For low sensitivity receptors the risk of dust impact is considered to be significantly lower than for medium and high sensitive receptors. Therefore, a factor of 0.5 would be applied to the final risk evaluation ranking.

For each receptor, the relative magnitude of risk is given by identifying which of the score categories in **Table 8 A-4** it falls into. This final evaluation represents the risk of dust impacts prior to control and mitigation measures being employed on site.

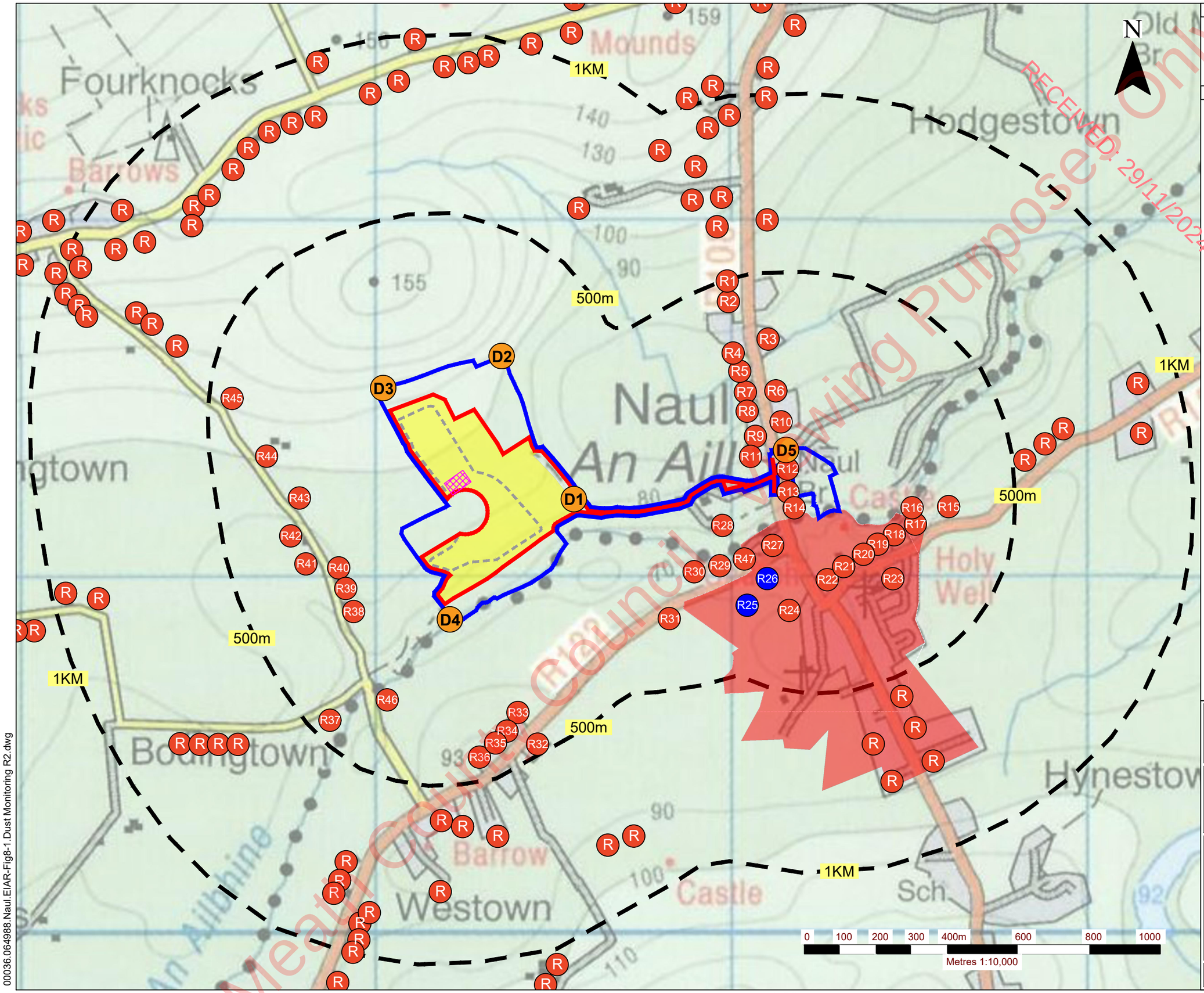
Table 8 A-4
Risk Evaluation Ranking (Without Mitigation)

Magnitude of Risk	Score
Insignificant	7 or less
Acceptable	8 to 14
Slight Adverse	15 to 24
Moderate Adverse	25 or more

[15] **Ireland M. (1992)** "Dust: Does the EPA go far enough?", Quarry Management, pp23-24.

FIGURES

Figure 8-1
Receptor and Dust Monitoring Locations



NOTES

1. Extract from Ordnance Survey Discovery Series Map No. 43
2. Ordnance Survey Ireland Licence No. CYAL50381397 (c) Tailte Éireann - Surveying

LEGEND

- LAND INTEREST AREA c.25 HECTARES (c.61.8 ACRES)
- APPLICATION AREA c.14.9 HECTARES (c.36.8 ACRES)
- EXISTING KILSARAN BATCHING PLANT P.REFS. 80/572 & 22/153 (ABP-314881-22)
- PROPOSED SAND AND GRAVEL PIT OPERATIONAL SITE AREA
- 500M & 1KM OFF-SET BOUNDARY TO APPLICATION SITE AREA (RED LINE) & EXISTING CONCRETE PLANT (CYAN AREA)
- RESIDENCE / RECEPTOR LOCATIONS
- NAUL VILLAGE
- PROPOSED EXTRACTION AREA c.6.2 HECTARES (c.15.3 ACRES)
- PROPOSED PROCESSING AREA (ON PIT FLOOR)
- D1 BASELINE DUST MONITORING LOCATIONS

Kilsaran
ideas taking shape

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ENVIRONMENTAL IMPACT ASSESSMENT REPORT

SAND & GRAVEL DEVELOPMENT
AT NAUL TOWNLAND, CO. MEATH

DUST MONITORING LOCATIONS

FIGURE 8-1

Scale	Date
1:10,000 @ A3	OCTOBER 2024

00036.064988.Naul.EIAR-Fig8-1.Dust Monitoring R2.dwg