

ATTACHMENT-7-1-3-1 EMISSIONS IMPACT ASSESSMENT – AIR

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1 EMISSIONS TO AIR

1.1 INTRODUCTION

This attachment assesses the predicted air impacts of the proposed soil recovery facility on the surrounding receiving environment. Additional detail on air quality impact assessment is included in Chapter 9 of the Environmental Impact Assessment Report (EIAR).

This attachment includes details of the Receiving Environment Report as well as the Emissions Impact Assessment for ease of reference.

As the soil recovery activity will occur simultaneously with the existing quarrying activity for a period of time, this attachment considers the combined implications of both activities.

This study will identify, describe and assess the impact of the subject site in terms of air quality during the operational/construction phase of the combined existing quarrying activity and the proposed soil recovery activity. Particular attention will be focused on sensitive receptors, such as residential areas adjacent to the site. Dust and increased traffic volumes associated with the subject site is likely to be the main impact source. When the activities cease post restoration there will be no potential for impact on air quality.

This assessment was prepared in accordance with the EIA Directive 2014/52/EC and having regard for the following guidance:

- Department of Environment, Heritage and Local Government (DoEHLG) (2004), *Quarries and Ancillary Activities, Guidelines for Planning Authorities*
- EPA (2006), Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals)
- EPA (2017) Guidelines on the Information to be Contained in Environmental Impact Assessment Reports, Environmental Protection Agency
- EPA (2015) Advice Notes for Preparing Environmental Impact Statements Draft, Environmental Protection Agency
- NRA (2011) Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes (Rev. 1) National Roads Authority (now Transport Infrastructure Ireland)
- EPA (2002) Guidelines on the Information to be contained in Environmental Impact Statements, Environmental Protection Agency
- EPA (2002) Advice Notes on Current Practice (in the Preparation of Environmental Impact Statements, Environmental Protection Agency

1.2 CHARACTERISTICS OF THE DEVELOPMENT

The site currently comprises an active quarry with an irregular configuration of 15.51Ha. It is located approximately 680m south of the N25 and is accessed from the L-3626 also known as Rocky Road. The site is subdivided by the L-3626 with the larger part of the site located on its north-eastern side and a smaller portion on its southwestern side. The proposed development will restore the quarry voids by backfilling them with imported soil and stones material. The estimated total volume of

material to be imported to the site is approximately 1.4M m³ (2.52M tonnes). Following restoration, the land will be returned to agricultural use.

The applicant has applied for permission with a duration of 18 years which allows for approximately 15 years of importation and 3 years of monitoring. Under the existing permissions for stone extraction and export at Midleton Quarry and the neighbouring Coppingerstown Quarry, a daily total of 172 HGV trips (86 each way; 1 load = 1 trip = 2 movements) are permitted to/from the site. It is proposed to maintain this level of vehicular movement for the combined operation of the 2 quarries and the proposed materials recovery activity and not to increase the traffic volumes. It is proposed to co-ordinate the exportation of quarrying activities and the importation of inert material for the soil recovery facility to maintain this level of traffic.

The proposed development also includes ancillary buildings and facilities required for the operation of the soils recovery facility. It is proposed to provide a weighbridge, wheelwash, car parking and a quarantine area to the southeast of Zone B (as shown on Drawing WL0008 in Attachment-3-2-1), adjacent to the link track to Coppingerstown Quarry thereby enabling use of the infrastructure for operations in both quarries (both recovery and quarrying) to increase efficiency of the overall business.

1.3 AIR QUALITY ASSESSMENT METHODOLOGY

Existing EPA air quality data and operator derived dust deposition monitoring data from the active quarry site has been examined in order to assess the background air quality in the area. It is used to identify the existing pollutant trends and to establish spatial information in order to determine compliance with relevant ambient air legislation.

The potential for dust emissions from the proposed development is addressed qualitatively in accordance with the dust risk assessment methodology presented in the NRA *Guidelines for the Treatment of Air Quality during the Planning and Construction of National Road Schemes* (Rev. 1) (NRA 2011).

Future air quality trends for the key traffic-derived pollutants (nitrogen dioxide and particulate matter) with and without the proposed development in place have been predicted using the screening air quality assessment from the U.K Highway Agency *Design Manual for Roads and Bridges* (DMRB) Volume 11, Section 3, Part 1 (May 2007), Air Quality.

1.3.1 Assessment Criteria

According to the *Quarries and Ancillary Activities*, Guidelines for Planning Authorities (Department of Environment, Heritage and Local Government (DoEHLG), (2004) and *Environmental Management Guidelines: Environmental Management in the Extractive Industry (Non-Scheduled Minerals)* (EPA, 2006) quarries by their nature, generate dust, with the main impact being disamenity due to dust deposition. However there is no Irish or European Union or Commission guideline or legislative limits for total suspended particles, so the limits provided by the TA Luft guidance *Technical Instructions on Air Quality Control* (TA Luft, 2002) are employed. Under this guidance the operator will be required to maintain monthly dust levels below the guideline limit of 350mg/m²/day as an annual average at sensitive residential receptors using the Bergerhoff Method. Below this threshold, the potential for

dust nuisance to impact people in the nearest residential, commercial or other structures will be minimised.

In May 2008, the European Commission introduced a revised Directive on ambient air quality and cleaner air for Europe (2008/50/EC), which has been transposed into Irish Legislation through the revised Air Quality Standards Regulations (S.I. 180 of 2011).

The Directive and Regulations specify limit values in ambient air for sulphur dioxide (SO₂), lead, benzene, particulate matter (PM₁₀ and PM_{2.5}), carbon monoxide (CO) and nitrogen dioxide (NO₂). These limits are mainly for the protection of human health and are largely based on review of epidemiological studies on the health impacts of these pollutants. In addition, there are limits that apply to the protection of the wider environment (ecosystems and vegetation). These limits are presented in **Table 1.1**.

Table 1-1: Limit Values in Ambient Air Quality

Pollutant	Criteria	Value
Nitrogen Dioxide	Hourly limit for protection of human health - not to be exceeded more than 18 times/year	200 µg/m ³ NO ₂
	Annual limit for protection of human health	40 µg/m ³ NO ₂
	Annual limit for protection of vegetation	30 µg/m ³ NO + NO ₂
Benzene	Annual limit for protection of human health	5 µg/m ³
Carbon Monoxide	Maximum daily 8-hour running mean	10 mg/m ³
Lead	Annual limit for protection of human health	0.5 µg/m ³
Sulphur Dioxide	Hourly limit for protection of human health - not to be exceeded more than 24 times/year	350 µg/m ³
	Daily limit for protection of human health - not to be exceeded more than 3 times/year	125 µg/m ³
	Annual limit for protection of vegetation	20 µg/m ³
Particulate Matter PM ₁₀	24-hour limit for protection of human health - not to be exceeded more than 35 times/year	50 µg/m ³ PM ₁₀
	Annual limit for protection of human health	40 µg/m ³ PM ₁₀
Particulate Matter PM _{2.5}	Annual target value for the protection of human health	25 µg/m ³ PM _{2.5}

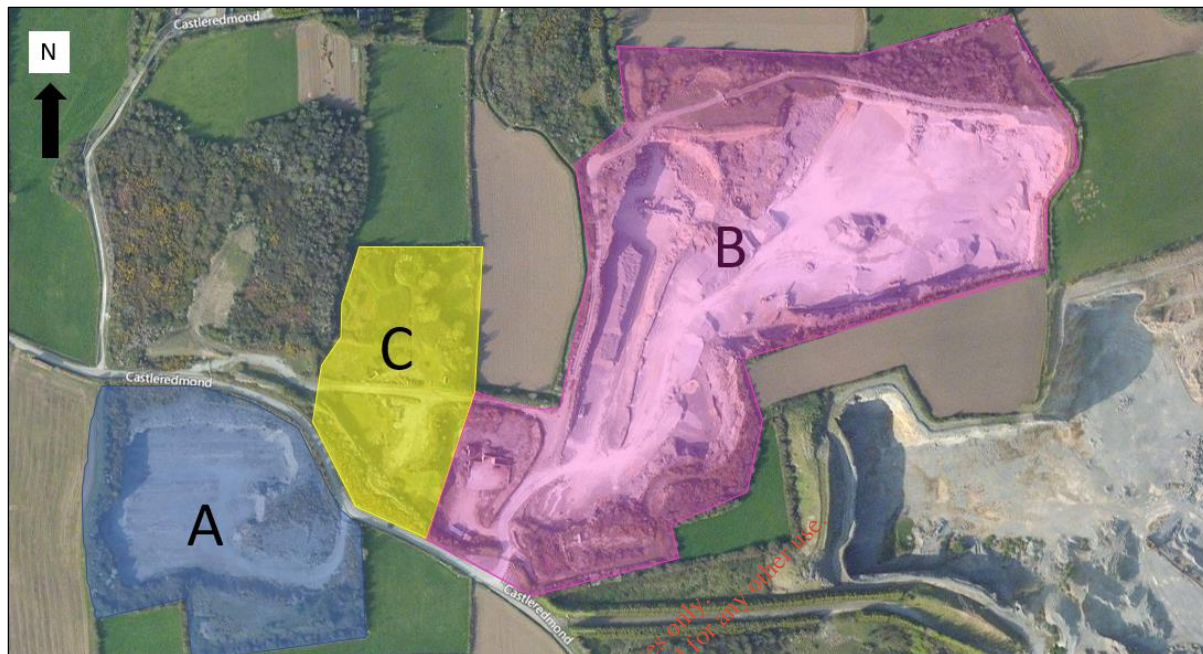
1.4 RECEIVING ENVIRONMENT

The subject site is in the townlands of Castleredmond, Coppingerstown and Carrigshane to the south west of Midleton, Co. Cork. The site is subdivided by the L-3626 with the larger part of the site located on its north-eastern side and a smaller portion on its southwestern side. Quarrying activity was permitted at the site by An Bord Pleanála (CCC Reg. Ref. 06/10088 and ABP Reference PL04.224250).

There is residential housing to the northwest along the L-3626, the closest of which is approximately 100m to the boundary of Zone A (see Figure 1.1) with agricultural land in between. There are a number of individual detached dwellings and farmyards to the north of Zone B and C (see Figure

1.1), the closest of which is approximately 120m north of the site. There are detached residences and farmyards to the south east of the site. The closest residence to the south east is approximately 230m from the subject site.

Figure 1.1 Zones A, B and C



The existing operations carry out monthly dust deposition monitoring at a series of seven locations around the site and area. The average of all valid monthly dust levels recorded in the period January 2012 to March 2018 are shown in **Table 1.2** and the locations of the dust monitors on site are presented in **Figure 1.2**.

The results show that all average dust levels at all seven locations are within the TA Luft guidelines for dust nuisance. Based on these results, dust impact from the current operation would pose a low risk to generating dust nuisance at the site.

Table 1-2: Average Dust Deposition at the Site

Reference	Average Deposition Level (mg/m ² /day)
D1	115
D2	246
D3	125
D4	347
D5	138
D6	271
D7	205
Guideline	350

Figure 2.2 Dust Monitoring Locations



Table 1-3 Dust Monitoring Location Coordinates

Name	Easting	Northing
D1	187757	72353
D2	189680	72555
D3	189990	72667
D4	190272	72715
D5	190145	72282
D6	190621	72460
D7	190592	72130

Air quality data available from the Environmental Protection Agency (EPA) monitoring network was also assessed. Four air quality zones have been defined for Ireland as follows:

- Zone A - Dublin Conurbation
- Zone B - Cork Conurbation
- Zone C - Other cities and large towns comprising Galway, Limerick, Waterford, Clonmel, Kilkenny, Sligo, Drogheda, Wexford, Athlone, Ennis, Bray, Naas, Carlow, Tralee, Dundalk, Navan, Letterkenny, Celbridge, Newbridge, Mullingar and Balbriggan
- Zone D- Rural Ireland i.e. the remainder of the state excluding Zones A, B and C

The subject site is located within air quality Zone D – Rural Ireland, however, due to the proximity of the proposed development to the N25 and the town of Midleton, the ambient air quality data from Zone B – Cork Conurbation has been employed to demonstrate a conservative assessment of the air quality in the locality. From the EPA report on ambient air quality in 2016 the most representative monitoring station in terms of the subject site is South Link Road in the AQIH Region. The South Link Road site is located on the south side of Cork City at the entrance to Tramore Valley Park. Monitoring is undertaken using continuous monitors for sulphur dioxide, nitrogen oxides, carbon monoxide and particulates (PM₁₀).

Table 1.3 shows the annual mean value concentrations measured for SO₂, PM₁₀, NO₂ and CO in the Zone B site the South Link Road, Cork and a representative rural site in Zone D (Enniscorthy) for 2016. The table compares the annual mean measured levels with the limit values defined in the National Air Quality Standards Regulations 2011 (S.I No. 180 of 2011).

Table 1-4: Mean value concentrations in Zone B (South Link Road) & Zone D (Enniscorthy) for 2016

Pollutant	Unit	Annual Mean Concentration in 2016		Annual Limit for Protection of Human Health
		Zone B	Zone D	
Sulphur Dioxide (SO ₂)	µg/m ³	6.1	2.5	20
Particulate Matter (PM ₁₀)	µg/m ³	17.9	17.3	40
Nitrogen Dioxide (NO ₂)	µg/m ³	22.7	9.6	40
Carbon Monoxide (CO)	mg/m ³	0.3	0.6	10

In summary, existing baseline levels of pollutants based on data from the EPA monitoring network in Zone B - Cork Conurbation and for Zone D – Rural Ireland are currently below ambient air quality limit values and by extension the levels in the vicinity of the subject site are also considered to be below the limit values.

1.5 POTENTIAL IMPACTS

1.5.1 Construction / Operational Phase

1.5.1.1 Operational Dust

Dust is considered a risk of pollution to the atmosphere from the proposed development both in its own right and also in combination with the existing quarrying operation. In accordance with the NRA Guidelines, where there are operations at a construction, quarrying or dust risk site, there is a risk that dust may cause an impact at sensitive receptors in close proximity to the source of the dust generated. The distances identified within which impacts may arise are presented in **Table 1.4** (source NRA Guidelines, May 2011 Revision).

Table 1-5: NRA Assessment Criteria for the Impact of Dust Emissions from Construction Activities, (with standard mitigation in place)

Source		Potential Distance for Significant Effects (Distance from source)		
Scale	Description	Soiling	PM ₁₀	Vegetation Effects
Major	Large Construction sites, with high use of haul routes.	100m	25m	25m
Moderate	Moderate Construction sites, with moderate use of haul routes.	50m	15m	15m
Minor	Minor Construction sites, with minor use of haul routes.	25m	10m	10m

Residential housing to the north west of the proposed boundary at Zone A is located within 100 metres of the works and potentially the proposed operations in this area. Operation related dust from the proposed development at these properties is likely to result in a ‘**Medium-Term Slight Adverse**’ impact without additional mitigation measures in place. Where dust related impacts are anticipated avoidance and mitigation measures will be put in place to reduce the impact level.

1.5.1.2 Operational Traffic

Traffic emissions are considered the principal off-site risk of pollution to the atmosphere from the proposed development in operation with the existing quarrying operation. This activity will generate levels of typical exhaust emission compounds including nitrogen oxides, carbon dioxide, particulate matter and hydrocarbons such as benzene.

The traffic impact analysis of the following scenarios is presented in Chapter 7 of the EIAR:

- Current Quarrying Operation in scenario years 2019, 2024 and 2034.
- Proposed ‘Do-Something’ Scenario years 2019, 2024 and 2034.

This traffic analysis presented both the baseline levels from the current operation coupled with the cumulative impact of the proposed development. The predicted traffic on the local road network can impact on properties along this network and analysis of this impact is presented for the following receptors:

- R1: Properties adjacent to the junction of the N25 and the L-3626.
- R2: Properties along the N25 corridor.

The results of the DMRB modelling for these receptors (including the Zone B, Cork City background levels) are presented in **Table 1.5** and indicate that the levels of road traffic pollution for each property group will only marginally increase with the proposed development in operation over the current impact of the quarrying operation both in 2019, 2024 and 2034. Using the NRA terminology, these changes in road traffic pollution associated with the proposed development would be classed as “**Negligible**”.

Table 1-6: Local Impact to Air Quality as a result of Operational Traffic – Conservative Assessment

Property	Scenarios	Speed (kph)	Nitrogen Dioxide ($\mu\text{g}/\text{m}^3$)	Particulates (PM_{10}) ($\mu\text{g}/\text{m}^3$)	
			Annual Average NO_2	Annual Average PM_{10}	No. of days $> 50\mu\text{g}/\text{m}^3$
R1 N25/L-3626	2019 Current Quarrying Operation	10	23.14	18.9	1.47
	2019 Proposed 'Do-Something'	10	23.35	18.14	1.51
	2024 Current Quarrying Operation	10	23.14	18.9	1.47
	2024 Proposed 'Do-Something'	10	23.35	18.14	1.51
	2034 Current Quarrying Operation	10	23.14	18.9	1.47
	2034 Proposed 'Do-Something'	10	23.35	18.14	1.51
R2 N25	2019 Current Quarrying Operation	50	24.70	18.67	1.97
	2019 Proposed 'Do-Something'	50	24.70	18.67	1.97
	2024 Current Quarrying Operation	50	24.86	18.73	2.02
	2024 Proposed 'Do-Something'	50	24.86	18.73	2.02
	2034 Current Quarrying Operation	50	25.14	18.81	2.10
	2034 Proposed 'Do-Something'	50	25.14	18.81	2.10
Statutory Limits			40	40	25

1.5.2 Post-Restoration Phase

Post restoration, the operational sources of pollution (i.e. dust and traffic) would be eliminated and there would cease to be any potential impact to air quality for this phase. As such the post restoration phase would result in a “Negligible” impact on air quality.

1.5.3 'Worst Case' Scenario

Complete separation of truck use between the soil recovery and stone extraction works would result in worst case scenario for the proposed project. This would result in a significant extension of the project to approximately 15.3 years.

This would entail trucks arriving empty to extract stone and leave empty after depositing soil. Based on existing extraction demand of 55 trucks arriving at the quarries then this will allow scope for only 31 trucks to arrive a day with soil in order to ensure that the total number of daily trucks on the L-3626 Rocky Road remains at the 172 truck movements (86 in each direction). This scenario will then only allow an approx. $91,450\text{m}^3$ (164,610 tonnes) annual intake of soil.

While the predicted daily traffic volumes would remain unchanged, the resultant air quality impact would remain “Negligible” but over a longer 15-year timeframe relative to the 8-year proposed scenario (as outlined in Section 7.5.1 of the EIAR). Similarly, the dust impact would remain a ‘Medium-Term Slight Adverse’ impact without additional mitigation measures in place.

1.6 MITIGATION MEASURES

1.6.1 Dust

In order to mitigate dust emissions during the construction / operational phase, a dust minimisation plan will be prepared as part of the Environmental Management System. The dust minimisation plan will be prepared with regard to the industry guidelines such as the Building Research Establishment document entitled '*Control of Dust from Construction and Demolition Activities*' and the Construction Industry Research and Information Association (CIRIA) '*Environmental Good Practice on Site*', 3rd Edition, 2010.

The dust minimisation plan will include the following mitigation measures:

- Site roads will be regularly cleaned and maintained as appropriate. Hard surface roads will be swept to remove mud and aggregate materials from their surface while any un-surfaced roads will be restricted to essential site traffic only.
- Any site roads with the potential to give rise to dust will be regularly watered, as appropriate, during dry and/or windy conditions (also applies to vehicles delivering material with dust potential).
- All vehicles exiting the site will make use of a wheel wash facility prior to entering onto public roads, to ensure mud and other wastes are not tracked onto public roads. Wheel washes will be self-contained systems that do not require discharge of the wastewater to water bodies.
- Public roads outside the site will be regularly inspected for cleanliness and cleaned as necessary.
- Material handling systems will be designed and laid out to minimise exposure to wind.
- Water misting or sprays will be used as required if particularly dusty activities are necessary during dry or windy periods.
- The transport of very fine soils should be undertaken in covered vehicles.

If the Applicant / Operator adheres to good working practices and the dust mitigation measures outlined above, the levels of dust generated are assessed to be minimal and are unlikely to cause an environmental nuisance. The Applicant / Operator will be required to maintain monthly dust levels below the guideline of 350mg/m²/day as a 30-day average at sensitive receptors using standard Bergerhoff gauges. Where dust levels are measured to be above this guideline the mitigation measures in the area must be reviewed as part of the dust minimisation plan.

1.6.2 Road Traffic

The collection of EU Directives, known as the Auto Oil Programme, have outlined improved emission criteria which manufacturers are required to achieve from vehicles produced in the past and in future years. This is a trend which has been in operation for many years and is destined to continue in future years for both cars and heavy-duty vehicles. The introduction of the National Car Test (NCT) has also helped to reduce transport emissions by ensuring that all vehicles on Irish roads over 4 years old undergo an emissions test.

No project specific mitigation measures have been identified but emissions of pollutants from road traffic can be controlled by either controlling the number of road users or by controlling the flow of

traffic. For the majority of vehicle-generated pollutants, emissions rise as speed drops, although the opposite is true at very high speeds (i.e. speeds greater than 120 km/hr). Emissions also tend to be higher under stop-start conditions when compared with steady speed driving. The free flow of traffic on routes such as the N25 will allow for the generation of lower concentrations of traffic related pollutants due to more steady speed driving. As outlined in the DMRB assessment presented in Table 9.5 above, with the development operational, compliance with all the relevant limit values will be achieved at the nearest sensitive receptors.

1.6.3 Monitoring

Monitoring on dust deposition is to continue at the seven existing monitoring locations (as per the existing quarrying permission) and shown in Figure 1.2 to assess the potential impact of the combined materials recovery and quarry activities and to inform the dust minimisation plan.

1.7 CUMULATIVE IMPACT

The cumulative impact of the existing quarry operation and the proposed infilling has been assessed in terms of dust impact and traffic impact in **Section 1.5.1**. Cumulative dust impacts are considered "**Medium-Term Slight Adverse**" while traffic impacts are considered "**Negligible**".

1.8 RESIDUAL IMPACT

With the additional dust management measures presented in **Section 1.6.1**, the residual dust impact will be "**Negligible**" once monitoring regime shows levels remaining below the TA Luft Guideline. Residual road traffic impacts are considered "**Negligible**".

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