MILLER GOODALL
ACOUSTICS - AIR QUALITY - LIGHTING

AIR QUALITY ASSESSMENT

on behalf of

POTTERS-BALLOTINI LTD.

for

STAIRFOOT GLASSWORKS

REPORT DATE: 28TH MARCH 2024

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Summary

This air quality report has been prepared to accompany a planning application for a proposed 'End of Waste Glass Recycling and Repurposing Facility' at the land of Stairfoot Glassworks. It assesses the potential changes in air quality due to the construction and operation of the proposed development and whether these potential changes would significantly alter air quality.

The assessment of dust soiling and human health impacts during the construction phase of the development results in the proposal of dust mitigation measures. The implementation of these will ensure that residual dust impacts during the construction phase are not significant.

Concentrations of NO_2 and PM_{10} are below their respective short-term objectives at the proposed development site which is therefore considered suitable for proposed use with regards to air quality. Concentrations of $PM_{2.5}$ are predicted to be below the annual mean target.

The proposed development is not expected to have a significant impact on local air quality. Mitigation will be in place which meets the BMBC Air Quality and Emissions Good Practice Planning Guidance requirements.

There is, therefore, no reason for this application to be refused on the grounds of air quality.

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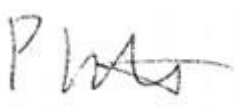
Signed		Signed	
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1	February 2023	First issue	UE
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1 Introduction

1.1 Miller Goodall Ltd has been instructed to prepare an air quality assessment to accompany a planning application for Stairfoot Glassworks, proposed Change of use of site to glass and metal recycling business and erection of associated buildings and outside yard areas at Stairfoot Brickworks. The site lies within the administrative boundary of Barnsley Metropolitan Borough Council (BMBC).

1.2 The report provides a review of the existing air quality in proximity to the proposed development site and assesses the potential impact of the proposed development on local air quality following Local Air Quality Management Technical Guidance[1] and EPUK and IAQM guidance[2].

1.3 The report provides an assessment of the potential air quality impacts associated with the construction and operational phases of the proposed development. The suitability of the site for the intended use is also assessed.

1.4 The main pollutants of health concern from road traffic exhaust releases are nitrogen dioxide (NO_2) and fine particulates, normally assessed as the fraction of airborne particles of mean aerodynamic diameter less than ten micrometres (PM_{10}) and 2.5 micrometres ($PM_{2.5}$) since these pollutants are most likely to approach their respective air quality objectives in proximity to major roads and congested areas. This assessment has therefore focused on the impact of the proposed development on concentrations of NO_2, PM_{10} and $PM_{2.5}$.

2 Site Description

2.1 The site was previously the Stairfoot Brickworks and is located east of A633 Wombwell Lane, Stairfoot, Barnsley S70 3NS.

2.2 The site is bounded to the north east by restored quarries comprising open land, woodland and a pond. The Trans Pennine Trail runs along the north and eastern boundary across which there is vacant land. A Geological SSSI lies at the eastern most point. The southeastern half of the site is a historic landfill site. To the west, the site is bound by Wombwell Lane with the Stairfoot Retail Park beyond.

2.3 The closest existing residential dwellings are on Wombwell Lane to the south of the site. There is an outline permission granted for residential dwellings to the northeast of the site, to the east of Sandygate Lane. The site location is shown in **Appendix A**.

3 Proposed Development

3.1 The proposed development is for the 'End of Waste Glass Recycling and Repurposing Facility'. The site infrastructure will include an office block, car park and landscaping, weighbridge, several exterior storage bays (eastern end of concrete hard standing), inert storage, skip store, lorry park, offices and parking and a main factory building and adjacent workshop.

[1] Department for the Environment Food and Rural Affairs (2022) '*Local Air Quality Management Technical Guidance Document LAQM.TG (22)*', London: Defra.

[2] EPUK and IAQM (January 2017) Land Use Planning and Development Control: Planning for Air Quality (v1.2)

3.2 The development will merge two existing operations; the client's 'Northern Cullet' Barnsley operation located at Borough Flint Glassworks and another site which is currently situated at Groveport, Scunthorpe.

3.3 The proposals comprise the change of use of site to glass and metal recycling business and erection of associated buildings and outside yard areas.

3.4 The transport consultant for the proposed development, Ramboll[3], advises that the proposed development is expected to generate 149 Annual Average Daily Traffic (AADT) with 64.5% HDVs.

4 Policy Context

4.1 Air Quality Objectives

4.1.1 The standards and objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations 2002; the Air Quality Standards Regulations 2010 set out the combined Daughter Directive limit values and interim targets for Member State compliance.

4.1.2 The United Kingdom left the European Union on 31st January 2020 and is no longer a member state. However, the current framework of air quality legislation was converted into domestic law through the European Union (Withdrawal) Act 2018[4].

4.1.3 The relevant air quality standards and objectives are presented in **Table 1**. Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health.

Table 1: Air Quality Strategy Objectives (England) for the Purposes of Local Air Quality Management

Pollutant	Air Quality Objective	
	Concentration	Measured As
Nitrogen dioxide (NO_2)	200 µg/m^3	1-hour mean not to be exceeded more than 18 times per year
	40 µg/m^3	Annual mean
Particles (PM_{10})	50 µg/m^3	24-hour mean not to be exceeded more than 35 times per year
	40 µg/m^3	Annual mean
Particles ($PM_{2.5}$)	25 µg/m^3	Annual mean (target)

[3] Email from Ramboll to MGL on 4th January 2024

[4] UK Parliament (2018): http://www.legislation.gov.uk/ukpga/2018/16/contents/enacted

4.1.4 Where an air quality objective is unlikely to be met by the relevant deadline, local authorities must designate those areas as Air Quality Management Areas (AQMAs) and take action to work towards meeting the objectives. Following the designation of an AQMA, local authorities are required to develop an Air Quality Action Plan (AQAP) to work towards meeting the objectives and to improve air quality locally.

4.1.5 Possible exceedances of air quality objectives are generally assessed in relation to those locations where members of the public are likely to be regularly present and are likely to be exposed for a period of time appropriate to the averaging period of the objective.

4.2 BMBC Air Quality Action Plan 2017-2021

4.3 The BMBC Air Quality Action Plan 2017-2021 provides information in respect of the actions planned by the Barnsley Metropolitan Borough Council in relation to declared AQMAs. Action Plans are the mechanism by which the local authorities, in collaboration with national agencies and others, outline their plans for working towards achieving the air quality objectives through the powers available to them.

5 BMBC (2020) Air Quality and Emissions Good Practice Planning Guidance

5.1 The BMBC (2020) Air Quality and Emissions Good Practice Planning Guidance document provides a method by which to classify a development site to determine the type of assessment and mitigation needed for it. The process follows a three-stage system that considers parameters such as the location of the development, size of the development, potential for new exposure and mitigation.

5.2 The site has been classified using the three-stage approach and the results of this assessment are shown in **Table 2**.

Table 2: Site classification assessment

Step	Outcome	Justification
Stage 1 Development Type Classification	Medium Development	The proposed development will lead to an increase of 149 Annual Average Trips with 64.5% of these being HDV. Even though more than 10% of trip generation is HDVs, we propose the development is medium. Additionally, it does not trigger > 100 HDV criteria of outside of an AQMA. The proposed development is not within an AQMA, will not trigger > 30 two way vehicle movements per hour and does not propose > 100 parking spaces.
Stage 2 Air quality impact assessment	Screening assessment	The proposal will not introduce additional exposure.
Stage 3 Mitigation and Compensation	Type 1 and Type 2 Mitigation	

5.3 The BMBC Air Quality and Emissions Good Practice Planning Guidance document requires “Type 1” and “Type 2” mitigation measures to offset any impacts that could occur due to the ‘medium’ classification.

6 Methodology

6.1 Data Sources

6.1.1 The air quality assessment has been undertaken and prepared with reference to information from several sources, as detailed in **Table 3**.

Table 3: Key Information Sources

Data Source	Reference
Barnsley Metropolitan Borough Council (BMBC)	BMBC (2021) *2021 Air Quality Annual Status Report* BMBC (2020) *Air Quality and Emissions Good Practice Planning Guidance* BMBC (2017, updated 2019) *Air Quality Action Plan*
Institute of Air Quality Management (IAQM)	IAQM (2014) *Assessment of Dust from Demolition and Construction* (v1.1)
Department for Environment Food and Rural Affairs (Defra)	Defra *Local Air Quality Management Technical Guidance TG(22), 2022*
Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM)	EPUK and IAQM (January 2017) *Land Use Planning and Development Control: Planning for Air Quality (v1.2)*
Ministry of Housing, Communities & Local Government	Planning Practice Guidance: Air Quality, November 2019 National Planning Policy Framework (NPPF), December 2023
Defra's LAQM Support Tools	Local Air Quality Management 1 km x 1 km grid background pollutant maps
Ramboll	Traffic Data
Greater London Authority (GLA)	Greater London Authority *The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance* (July 2014)

6.2 Consultation

6.2.1 The proposed air quality assessment methodology was sent to BMBC[5]. At the time of writing no reply had been received.

[5] Email from Miller Goodall to BMBC at pollutioncontrol@barnsley.gov.uk, dated February 2023

6.2.2 There was no objection regarding air quality matters in the preapplication response (2019/ENQ/00799). It was advised that the applicant joins the Eco Stars scheme in accordance with the BMBC good practice guidance and in accordance with the Sustainable Travel SPD, 10% of parking should be provided with EV charging points.

6.2.3 The air quality assessment has been prepared to the latest legislation, guidance and best practice.

6.3 Construction Dust Assessment

6.3.1 The BMBC Air Quality and Emissions Good Practice Planning Guidance document states that developments should adhere to the London Best Practice Guidance[6]. It provides the assessment of air quality impacts arising from construction and demolition activities and has been used in this assessment. This section follows a risk assessment to determine the likely impact of the development on nearby receptor location during the construction phase and goes on to recommend mitigation measures that should be implemented to reduce any impact. The methodology for the assessment is shown in **Appendix B.** The study area in relation to the construction dust and the buffer zones of <20 m, 20 m – 50 m and 50 – 100 m from the site are shown in **Appendix C**.

6.3.2 Therefore, the recommended mitigation outlined in **Appendix D** follows the London guidance[6]. The risks and mitigation are broadly identical in both guidance documents.

6.4 Simple Air Quality Assessment

6.4.1 A simple assessment of air quality in terms of the impact of the development and suitability of the site, which relies on already published information, has been completed using sources such as the Local Authority's monitoring network and the Defra LAQM support tools.

7 Baseline Air Quality

7.1 Local Air Quality

7.1.1 Baseline air quality at the proposed development has been established by examining monitoring data produced by BMBC (provided in the 2021 Annual Status Report) and background concentration maps provided by Defra for the grid squares covering the proposed development.

7.1.2 The development is not located within an Air Quality Management Area (AQMA); the closest AQMA is located approximately 2.5 km to the east of the site, incorporating the southbound carriageway of the A61 Sheffield Road adjacent to the junction with the A6133 Cemetery Road.

7.2 Air Quality Monitoring

Nitrogen Dioxide (NO_2)

7.2.1 BMBC monitors NO_2 at two automatic monitoring stations and numerous diffusion tube monitoring sites across the borough. The closest monitoring sites are located to the north of the proposed development site, all of which

[6] Greater London Authority (GLA) (2014) '*The Control of Dust and Emissions during Construction and Demolition Supplementary Planning Guidance*' (July 2014)

are diffusion tubes. The results from these diffusion tubes are shown in Table 4 and the monitor locations are shown in **Appendix A**.

Table 4: Annual Mean NO_2 Concentrations Monitored by BMBC within the Study Area

Site ID	Location		Annual Mean NO2 Concentrations (µg/m3)				
			2016	2017	2018	2019	2020
DT46 (kerbside)	437554	405291	**46.7**	**48.1**	38.4	**42.2**	29.0
DT49 (kerbside)	437528	405675	**48.7**	**46.4**	39.0	**41.9**	30.2
DT55 (roadside)	437369	405456	**-**	**-**	**-**	**42.6**	27.0
DT57 (roadside)	437242	405772	**-**	**-**	-	38.9	29.1
DT58 (roadside)	437250	405813	**-**	**-**	-	37.4	26.1
Annual Mean NO_2 air quality objective					40 µg/m^3		

7.2.2 The monitoring results in **Table 4** indicate that annual mean NO_2 concentrations at DT57 and DT58 were below the NO_2 annual mean objective during the period shown. Annual mean NO_2 concentrations at DT46, DT49 and DT55 have recorded exceedances of NO_2 annual mean objective during the period shown.

7.2.3 The results indicate that the short-term objective for NO_2 was unlikely to be exceeded, as monitored annual mean concentrations were well below the indicative screening concentration of 60 µ/gm^3 during the period shown.

Particulate Matter (PM_{10} & $PM_{2.5}$)

7.2.4 BMBC does not undertake $PM_{2.5}$ monitoring. There is one PM_{10} monitoring site in Barnsley, CM1. This monitoring station is approximately 1.5 km northwest of the proposed development site. CM1 is not representative of conditions at the development site, however, it is confirmed there have been no exceedances of the PM_{10} annual mean objective.

7.3 Background Concentrations

7.3.1 There are no background monitoring locations in the vicinity of the proposed development site.

7.3.2 Background concentrations of NO_2, PM_{10} and $PM_{2.5}$ obtained from the background concentration maps provided by Defra for the grid squares covering the proposed development and receptor locations[7] are shown in **Table 5**.

[7] http://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018

Table 5: Background Pollutant Concentrations Obtained for the 1km x 1km Grid Squares Covering the Site*

Grid Square	Pollutant	2023 ($\mu g/m^3$)
437500, 405500	NO_2	10.38
	PM_{10}	12.07
	$PM_{2.5}$	6.96
437500, 404500	NO_2	8.71
	PM_{10}	11.80
	$PM_{2.5}$	6.82

** Background concentrations obtained from the latest 2018 based background maps*

8 Construction Dust Impact Assessment

8.1 Step 1 – Requirement for a Detailed Assessment

8.1.1 There are sensitive receptors located within 350m of the site boundary, therefore, a detailed assessment of the construction phase of the development has been undertaken. There are no ecological designations within 50m of the site boundary or trackout routes which require assessment.

8.2 Step 2 – Assess the Risk of Dust Impacts

Step 2A Dust Emission Magnitude

8.2.1 The potential dust emission magnitude in relation to the development has been determined using the criteria detailed in **Table B1** in **Appendix B**. The scale and nature of works onsite were considered to determine the potential dust emission magnitude for earthwork activities, construction and trackout activities. Demolition is not required at the development site. Information to determine the classification has been estimated from the site plans, Google Earth and information provided by the Applicant. The dust emission magnitude is outlined in **Table 6.**

Table 6: Dust Emission Magnitudes for Each Activity

Activity	Dust Emission Magnitudes	Justification for Sensitivity Classification
Earthworks	Large	• the site area is > 10,000 m^2
Construction	Medium	• total building volume to be constructed is predicted to be between 25,000 m^3 and 100,000 m^3
Trackout	Medium	• there are likely to be 10 - 50 HDV outward movements in any one day

Step 2B Sensitivity of the Receptors to Dust Soiling and Health Effects

8.2.2 Dwellings are located within a distance of 20 m from the site boundary and 20 m of road edges used by traffic associated with the site construction. In accordance with the criteria in **Table B2** in **Appendix B** and the GLA guidance, the sensitivity of human receptors is **high**.

Step 2B Sensitivity of the Area to Dust Soiling and Human Health Effects of PM_{10}

8.2.3 The sensitivity of the area for dust soiling and human health effects has been determined using the criteria detailed in **Table B3 and Table B4** respectively in **Appendix B.**

8.2.4 The sensitivity of the area to dust soiling and human health for each activity is summarised in **Table 7**.

Table 7: Outcome of Defining the Sensitivity of the Area

Pollution	Activity	Sensitivity of the Surrounding Area	Justification for Sensitivity Classification
Dust Soiling	Earthworks	Medium	There are 1 – 10 highly sensitive residential receptors within 20 m of the site boundary
	Construction	Medium	There are 1 – 10 highly sensitive residential receptors within 20 m of the site boundary
	Trackout	Medium	There are 1 – 10 highly sensitive receptors within 20 m of roads that relevant vehicles are likely to use that are up to 500 m from the site.
Human Health	Earthworks	Low	There are 1 – 10 highly sensitive residential receptors within 20 m of the site boundary. Background PM_{10} concentrations are predicted to be <24 µg/m^3
	Construction	Low	There are 1 – 10 highly sensitive residential receptors within 20 m of the site boundary. Background PM_{10} concentrations are predicted to be <24 µg/m^3
	Trackout	Low	There are 1 – 10 highly sensitive receptors within 20 m of roads that relevant vehicles are likely to use that are up to 500 m from the site, and the PM_{10} background PM_{10} concentrations are predicted to be <24 µg/m^3.

Step 2C Risk of Impacts

8.2.5 The dust emission magnitude and sensitivity of the area were combined and the risk of impacts determined using the criteria detailed in **Table B5** to **Table B8** in **Appendix B.**

8.2.6 A summary of the risks, before mitigation measures are applied, for dust soiling and human health are shown in **Table 8**.

Table 8: Risk of Dust Impacts

Potential Impact	Dust Risk		
	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Low
Human Health	Low	Low	Low

8.3 Step 3 – Site-Specific Mitigation

8.3.1 Step 3 of the GLA guidance identifies appropriate site-specific mitigation. These measures are related to the site risk for each activity. Mitigation measures specific to earthworks, construction and trackout are proposed based on the risk classifications in **Table 8**. Recommended mitigation measures are shown in **Appendix D.**

8.3.2 The general mitigation measures (for site management, preparing and maintaining the site, operating vehicle/machinery, operations and waste management), are appropriate for a site with a 'medium risk' classification (in this instance the site is classified as "medium" risk due to earthworks and construction)[8].

8.4 Step 4 – Determine Significant Effects

8.4.1 The characteristics of the site and the surrounding area suggest that mitigation would not be impracticable or ineffective. With the implementation of the mitigation measures, therefore, the residual impacts from the construction are considered to be not significant when considered following GLA guidance.

9 Effect of Air Quality on the Proposed Development

9.1 The proposed development is commercial and therefore, only the one-hour mean air quality objective applies for future use exposure. LAQM.TG(22) provides a qualitative screening approach to determine whether there is a risk of exceedance of the one-hour NO_2 air quality objective. If the ambient NO_2 annual mean concentration is above 60 µg/m^3 there is a risk that the one-hour objective (200 µg/m^3) may be exceeded.

9.2 The local monitoring data in **Table 4** and background concentrations in **Table 5** show that concentrations of NO_2, PM_{10} and $PM_{2.5}$ are well below health-based air quality objectives of 60 µg/m^3 for both pollutants. The predicted NO_2 concentrations are all well below 60 µg/m^3 and, therefore, when considered in light of guidance in LAQM.TG (22), the 1-hour mean objective is unlikely to be exceeded.

9.3 The evidence from existing information sources is that the proposed development site is likely to experience levels of NO_2 below the short-term objectives.

9.4 The site is therefore considered suitable for the proposed use with regard to air quality.

Impact of the Proposed Development on Existing Air Quality

9.4.1 The proposed development is located outside an AQMA and is expected to lead to annual average weekday flows of approximately 52 LDVs and 97 HDVs as confirmed by the traffic consultant. When averaged over the year considering weekends and holidays (for AADT calculations), the movements are expected to be even lower.

[8] For those mitigation measures that are general, the highest risk category should be applied. For example, if the site is medium risk for earthworks and construction, but a high risk for demolition and track-out, the general measures applicable to a high risk site should be applied.

9.4.2 As these changes are less than 500 LDV and 100 HDV AADT outside the AQMA, IAQM guidance[9] indicates that the impact of road traffic associated with the development is likely to have an insignificant impact on local air quality. The routing of the traffic is not yet known so we can not comment on the traffic within the AQMA.

9.4.3 However, considering these numbers have not taken into account the past use of the of the site as a Brickworks and therefore the net traffic movements are expected to be even lower, we do not expect the net traffic to be above the threshold of 100 LDV AADT and 25 HDV AADT within the closest AQMA. Additionally, it should be noted that the AQMAs are on the central town centre routes, which is unlikely to be a desirable route for HDVs of the development.

9.4.4 Therefore, the assessment of impact of the the proposed development on the existing air quality has been scoped out.

10 Mitigation

10.1 As per BMBC Air Quality and Emissions Good Practice Planning Guidance document, “Type 1” and “Type 2” mitigation measures would be required to offset any impacts that could occur due to the ‘medium’ classification.

10.2 The development will control construction emissions in accordance with London Best Practice Guidance[6]. Mitigation of construction dust will be achieved by the use of the mitigation measures outlined in **Appendix D**. The listed dust mitigation will be incorporated into a wider Construction, Emissions, Management, Plan (CEMP).

10.3 Potential for dust during operational phase will be minimized by ensuring a dust management plan (DMP) is in place.

10.4 The following commercial development specific mitigation measures will also be considered:

- 10% EV parking spaces
- Fleet operators should join the South Yorkshire Eco Stars scheme
- All commercial vehicles to comply with current or most recent European emission standards and provide a strategy for reducing emissions.

11 Summary of Impacts and Conclusion

11.1 This air quality report assesses the potential changes in air quality due to the construction and operation of the proposed development and whether these potential changes would significantly alter air quality.

11.2 The assessment of dust soiling and human health impacts during the construction phase of the development results in the proposal of dust mitigation measures. The implementation of these will ensure that residual dust impacts during the construction phase are not significant.

[9] EPUK and IAQM (January 2017) *Land Use Planning and Development Control: Planning for Air Quality (v1.2)*

11.3 Concentrations of NO_2 and PM_{10} are likely to be below their respective applicable short-term objectives at the proposed development site which is therefore considered suitable for specified use with regards to air quality. Concentrations of $PM_{2.5}$ are expected to be below the annual mean target.

11.4 The proposed development is not expected to have a significant impact on local air quality. Mitigation will be in place which meets the BMBC Air Quality and Emissions Good Practice Planning Guidance requirements.

11.5 There is, therefore, no reason for this application to be refused on the grounds of air quality.

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APPENDICES

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Appendix A: Location of the site and BMBC monitoring

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Appendix B: GLA Dust Risk Assessment Methodology

The following section outlines criteria developed by the GLA[6] for the assessment of air quality impacts arising from construction and demolition activities. The assessment procedure is divided into four steps and is summarised below:

Step 1: Screen the Need for a Detailed Assessment

An assessment will normally be required where there are human receptors within 350 m of the site boundary and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s). Ecological receptors within 50 m of the site boundary or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s), are also identified at this stage. An ecological receptor refers to any sensitive habitat affected by dust soiling. For locations with a statutory designation, such as a Site of Specific Scientific Interest (SSSI), Special Area of Conservation (SACs) and Special Protection Areas (SPAs), consideration should be given as to whether the particular site is sensitive to dust. Some non-statutory sites may also be considered if appropriate.

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is 'negligible' and any effects will not be significant.

Step 2: Assess the Risk of Dust Impacts

In step two, a site is allocated to a risk category on the basis of the scale and nature of the works (Step 2A) and the sensitivity of the area to dust impacts (Step 2B). These two factors are combined in Step 2C to determine the risk of dust impacts before the implementation of mitigation measures. The assigned risk categories may be different for each of the construction activities outlined by the GLA (construction, demolition, earthworks and trackout). A site can be divided into zones, for example on a large site where there are differing distances to the nearest receptors.

Step 2A: Define the Potential Dust Emission Magnitude

Dust emission magnitude is based on the scale of the anticipated works and is classified as Small, Medium or Large. The GLA guidance recommends that the dust emission magnitude is determined separately for demolition, earthworks, construction and trackout. **Table 1** describes the potential dust emission class criteria for each outlined activity.

Table 1: Criteria Used in the Determination of Dust Emission Magnitude

Activity	Criteria used to Determine Dust Emission Magnitude		
	Small	Medium	Large
Demolition	Total building volume <20,000 m^3, construction materials with low potential for dust release.	Total building volume 20,000 m^3 – 50,000 m^3, potential dusty construction material.	Total building volume >50,000 m^3, potentially dusty construction material.
Earthworks	Total site area <2,500 m^2, soil type with large grain	Total site area 2,500 – 10,000 m^2, moderately dusty soil type	Total site area >10,000 m^2, potentially dusty soil type
Construction	Total building volume <25,000 m^3.	Total building volume 25,000 – 100,000 m^3.	Total building volume >100,000 m^3.
Trackout	<10 outward HDV trips in any one day. Unpaved road length <50 m.	10-50 outward HDV trips in any one day. Unpaved road length 50-100 m.	>50 outward HDV trips in any one day. Unpaved road length >100 m.

Step 2B: Define the Sensitivity of the Area

The sensitivity of the area takes into account the following factors:

- the specific sensitivities of receptors in the area;
- the proximity and number of receptors;
- the local background PM_{10} concentration; and
- site-specific factors, such as whether there are natural shelters, such as trees, to reduce the risk of windblown dust.

The criteria detailed in **Table 2** is used to determine the sensitivity of the receptor in relation to dust soiling, health effects and ecological effects.

Table 2: Criteria for Determining Sensitivity of Receptors

Sensitivity of Receptor	Criteria for Determining Sensitivity		
	Dust Soiling Effects	Health Effects of PM_{10}	Ecological Sites
High	Dwellings, museums and other culturally important collections, medium and long-term car parks and car showrooms	Residential properties, hospitals, schools and residential care homes	International or national designation *and* the features may be affected by dust soiling
Medium	Parks, places of work	Office and shop workers not occupationally exposed to PM_{10}	Presence of an important plant species where dust sensitivity is uncertain or locations with a national designation with features that may be affected by dust deposition
Low	Playing fields, farmland, footpaths, short-term car parks and roads	Public footpaths, playing fields, parks and shopping streets	Local designation where features may be affected by dust deposition

Table 3 and **Table 4** are then used to define the sensitivity of the area to dust soiling and human health effects. This should be derived for each of construction, demolition, earthworks and trackout.

Table 3: Sensitivity of the Area to Dust Soiling Effects on People and Property.

Receptor Sensitivity	Number of Receptors	Distance from Source (m)*			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

*distances considered are to the dust source

Table 4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	-	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

The sensitivity of the area is then summarised.

Step 2C Define the Risks of Impacts

The dust emission magnitude from **Table 1** and sensitivity of the area and receptors from **Table 2**, **Table 3** and **Table 4** are combined, and the risk of impacts from each activity (demolition, earthworks, construction and trackout) before mitigation is applied, is determined using the criteria detailed in **Table 5** to **Table 8.**

Table 5: Risk of Dust Impacts - Demolition

Potential Impact Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 6: Risk of Dust Impacts- Earthworks

Potential Impact Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 7: Risk of Dust Impacts- Construction

Potential Impact Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Table 8: Risk of Dust Impacts- Trackout

Potential Impact Sensitivity of the Area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Low Risk	Negligible
Low	Low Risk	Low Risk	Negligible

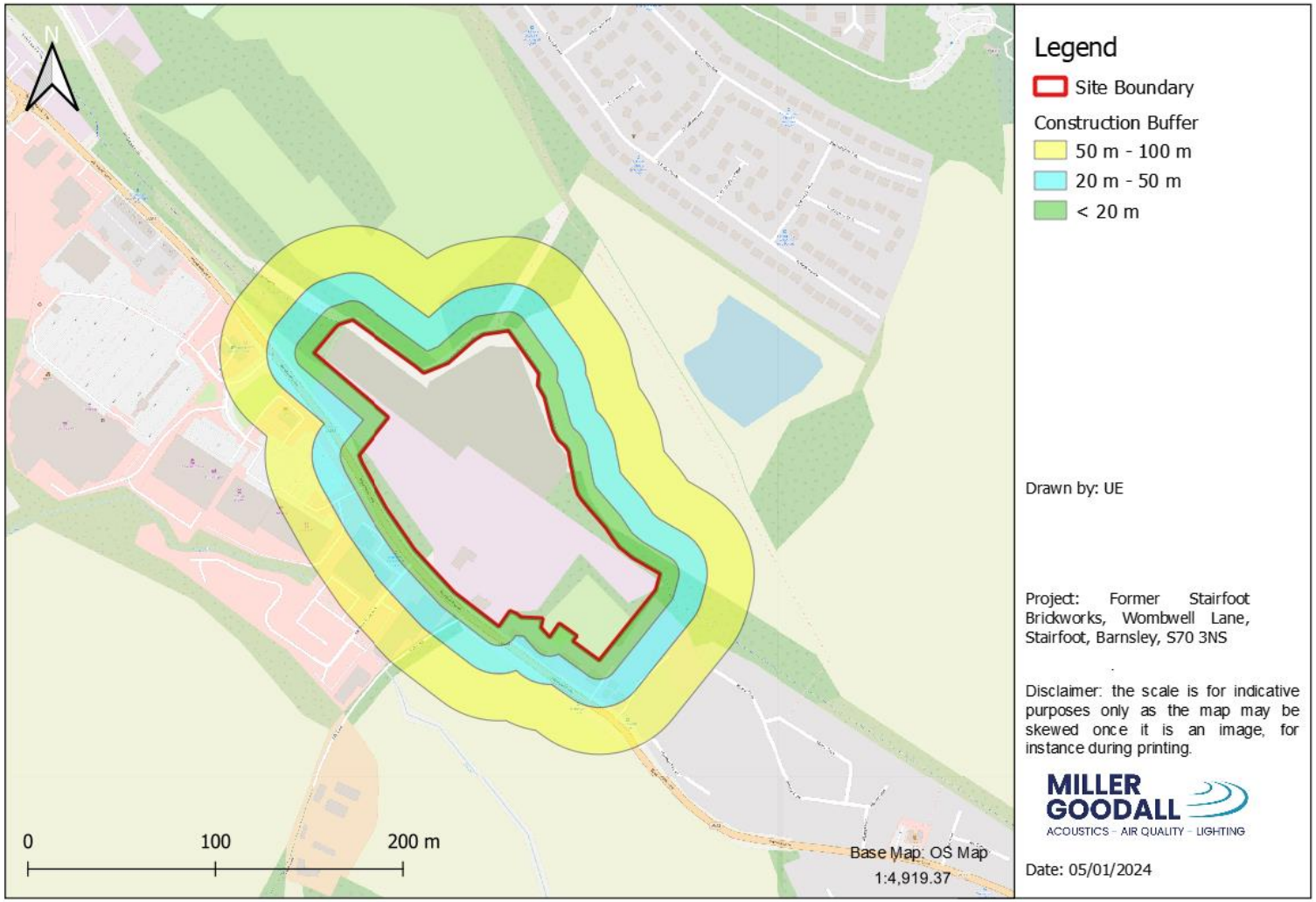
Step 3 Determine Site Specific Mitigation

Step three of the GLA guidance identifies appropriate site-specific mitigation. These measures are related to whether the site is a low, medium or high risk site.

Step 4 Determine Significance of Residual Effects

At step four the significance of residual effects is assessed. For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'. There may be cases where, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Therefore, it is important to consider the specific characteristics of the site and the surrounding area to ensure that a conclusion of no significant effect is robust.

Appendix C: Construction Dust Buffer Zones



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Appendix D: GLA Dust Assessment Mitigation

xx Highly Recommended **x Desirable**

Measures relevant for demolition, earthworks, construction and trackout.

MITIGATION MEASURE	Medium Risk
Site management	
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	XX
Develop a Dust Management Plan.	XX
Display the name and contact details of person(s) accountable for air quality pollutant emissions and dust issues on the site boundary.	XX
Display the head or regional office contact information.	XX
Record and respond to all dust and air quality pollutant emissions complaints.	XX
Make a complaints log available to the local authority when asked.	XX
Carry out regular site inspections to monitor compliance with air quality and dust control procedures, record inspection results, and make an inspection log available to the local authority when asked.	XX
Increase the frequency of site inspections by those accountable for dust and air quality pollutant emissions issues when activities with a high potential to produce dust and emissions and dust are being carried out, and during prolonged dry or windy conditions.	XX
Record any exceptional incidents that cause dust and air quality pollutant emissions, either on or off the site, and the action taken to resolve the situation is recorded in the log book.	XX
Preparing and maintaining the site	
Plan site layout: machinery and dust causing activities should be located away from receptors.	XX
Erect solid screens or barriers around dust activities or the site boundary that are, at least, as high as any stockpiles on site.	XX
Fully enclosure site or specific operations where there is a high potential for dust production and the site is active for an extensive period.	XX
Install green walls, screens or other green infrastructure to minimise the impact of dust and pollution.	X
Avoid site runoff of water or mud.	XX
Keep site fencing, barriers and scaffolding clean using wet methods.	XX
Remove materials from site as soon as possible.	XX

MITIGATION MEASURE	Medium Risk
Cover, seed or fence stockpiles to prevent wind whipping.	XX
Carry out regular dust soiling checks of buildings within 100m of site boundary and cleaning to be provided if necessary.	X
Agree monitoring locations with the Local Authority.	XX
Where possible, commence baseline monitoring at least three months before phase begins.	XX
Put in place real-time dust and air quality pollutant monitors across the site and ensure they are checked regularly.	XX
Operating vehicle/machinery and sustainable travel	
Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone.	XX
Ensure all non-road mobile machinery (NRMM) comply with the standards set within this guidance.	XX
Ensure all vehicles switch off engines when stationary – no idling vehicles.	XX
Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where possible.	XX
Impose and signpost a maximum-speed-limit of 10mph on surfaced haul routes and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).	X
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	XX
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	XX
Operations	
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	XX
Ensure an adequate water supply on the site for effective dust/particulate matter mitigation (using recycled water where possible).	XX
Use enclosed chutes, conveyors and covered skips.	XX
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	XX
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	XX
Waste management	

MITIGATION MEASURE	Medium Risk
Reuse and recycle waste to reduce dust from waste materials	XX
Avoid bonfires and burning of waste materials.	XX

Measures specific to earthworks.

MITIGATION MEASURE	Medium Risk
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces.	X
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil.	X
Only remove secure covers in small areas during work and not all at once.	X

Measures specific to construction.

MITIGATION MEASURE	Medium Risk
Avoid scabbling (roughening of concrete surfaces) if possible	X
Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place	XX
Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.	X
For smaller supplies of fine powder materials ensure bags are sealed after use and stored appropriately to prevent dust.	X

Measures specific to trackout.

MITIGATION MEASURE	Low Risk
Regularly use a water-assisted dust sweeper on the access and local roads, as necessary, to remove any material tracked out of the site.	X
Avoid dry sweeping of large areas.	X
Ensure vehicles entering and leaving sites are securely covered to prevent escape of materials during transport.	X
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	X

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Glossary of Terms

AADT Annual Average Daily Traffic flow

Air Quality Standard Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health and the environment

Air Quality Objective Pollutant Objectives incorporate future dates by which a standard is to be achieved, taking into account economic considerations, practicability and technical feasibility

Annual Mean A mean pollutant concentration value in air which is calculated on a yearly basis, yielding one annual mean per calendar year. In the UK air quality regulations, the annual mean for a particular substance at a particular location for a particular calendar year is:

(a) in the case of lead, the mean of the daily levels for that year;

(b) in the case of nitrogen dioxide, the mean of the hourly means for that year;

(c) in the case of PM_{10}, the mean of the 24-hour means for that year.

Annoyance (Dust) Loss of amenity due to dust deposition or visible dust plumes, often related to people making complaints, but not necessarily sufficient to be a legal nuisance.

AQAP Air Quality Action Plan

AQEG Air Quality Expert Group

AQMA Air Quality Management Area

AQMP Air Quality Management Plan

AQO Air Quality Objective

AQS Air Quality Strategy for England, Scotland, Wales and Northern Ireland

Background Concentrations The term used to describe pollutant concentrations which exist in the ambient atmosphere, excluding local pollution sources such as roads and stacks

Construction Any activity involved with the provision of a new structure (or structures), its modification or refurbishment. A structure will include a residential dwelling, office building, retail outlet, road, etc.

Construction Impact Assessment An assessment of the impacts of demolition, earthworks, construction and trackout. In this Guidance, specifically the air quality impacts.

Defra Department for Environment, Food and Rural Affairs

Demolition Any activity involved with the removal of an existing structure (or structures). This may also be referred to as de-construction, specifically when a building is to be removed a small part at a time.

Deposited Dust that is no longer in the air and which has settled onto a surface. Deposited dust is also sometimes called amenity dust or nuisance dust, with the term nuisance applied in the general sense rather than the specific legal definition.

DMP Dust Management Plan; a document that describes the site-specific methods to be used to control dust emissions.

Dust Solid particles that are suspended in air, or have settled out onto a surface after having been suspended in air. The terms dust and particulate matter (PM) are often used interchangeably, although in some contexts one term tends to be used in preference to the other. In this guidance the term 'dust' has been used to include the particles that give rise to soiling, and to other human health and ecological effects. Note: this is different to the definition given in BS 6069, where dust refers to particles up to 75 µm in diameter.

Earthworks Covers the processes of soil-stripping, ground-levelling, excavation and landscaping.

Effects The consequences of the changes in airborne concentration and/or dust deposition for a receptor. These might manifest as annoyance due to soiling, increased morbidity or morality due to exposure to PM_{10} or $PM_{2.5}$ or plant dieback due to reduced photosynthesis. The term 'significant effect' has a specific meaning in EIA regulations. The opposite is an insignificant effect. In the context of construction impacts any effect will usually be adverse, however, professional judgement is required to determine whether this adverse effect is significant based in the evidence presented.

EPUK Environmental Protection UK

HDV Heavy Duty Vehicle

Impacts The changes in airborne concentrations and/or dust deposition. A scheme can have an 'impact' on airborne dust without having any 'effects', for instance if there are no receptors to experience the impact.

LAQM Local Air Quality Management

LDV Light Duty Vehicle

Mg/m^3 Microgrammes (of pollutant) per cubic metre of air. A measure of concentration in terms of mass per unit volume. A concentration of 1 µg/m^3 means that one cubic metre of air contains one microgramme (millionth of a gramme) of pollutant

NO_2 Nitrogen Dioxide

NOx A collective term used to represent the mixture of nitrogen oxides in the atmosphere, as nitric oxide (NO) and nitrogen dioxide (NO_2)

NPPF National Planning Policy Framework

Nuisance The term nuisance dust is often used in a general sense when describing amenity dust. However, this term also has specific meanings in environmental law:

Statutory nuisance, as defined in S79(1) of the Environmental Protection Act 1990 (as amended from time to time).

Private nuisance, arising from substantial interference with a person's enjoyment and us of his land.

Public nuisance, arising from and act or omission that obstructs, damages or inconveniences the right of the community.

Each of these applying in so far as the nuisance relates to the unacceptable effects of emissions. It is recognised that a significant loss of amenity may occur at lower levels of emission than would constitute a statutory nuisance.

Note: as nuisance has a specific meaning in environmental law, and to avoid confusion, it is recommended that the term is not used in a more general sense.

$PM_{2.5}$ The fraction of particles with a mean aerodynamic diameter equal to, or less than, 2.5 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of $PM_{2.5}$, EN 14907, with a 50% efficiency cut-off at 2.5 µm aerodynamic diameter

PM_{10} The fraction of particles with a mean aerodynamic diameter equal to, or less than, 10 µm. More strictly, particulate matter which passes through a size selective inlet as defined in the reference method for the sampling and measurement of PM_{10}, EN 12341, with a 50% efficiency cut-off at 10 µm aerodynamic diameter

Running Annual Mean A mean pollutant concentration value in air which is calculated on an hourly basis, yielding one running annual mean per hour. The running annual mean for a particular substance at a particular location for a particular hour is the mean of the hourly levels for that substance at that location for that hour and the preceding 8759 hours

Trackout The transport of dust and dirt from the construction/demolition site onto the public road network, where it may be deposited and then re-suspended by vehicles using the network. This arises when heavy duty vehicles (HDVs) leave the construction/demolition site with dusty materials, which may then spill onto the road, and/or when HDVs transfer dust and dirt onto the road having travelled over muddy ground on site.


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