



Air Quality Assessment

MARS Cares & Treats, Birstall



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Lucion Contact	Martin Lucass (martin.lucass@luciongroup.com)

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Executive Summary

<p>Site and Report Context</p>	<p>Lucion Delta-Simons Ltd (“Lucion”) was instructed by MARS Cares & Treats (the 'Client') to undertake an Air Quality Assessment in support of a planning application for a proposed ammonia plant (the 'Proposed Development') at MARS Cares & Treats, Birstall (the 'Site').</p> <p>The Proposed Development has the potential to cause adverse impacts to existing pollution levels at nearby sensitive receptors. As such, an Air Quality Assessment is required to determine baseline conditions at the Site and to assess potential impacts associated with the Proposed Development, in accordance with the requirements of the National Planning Policy Framework (NPPF) (as amended 2025).</p> <p>This report presents the findings of the assessment, which addresses the potential air quality impacts during both the construction and operational phases of the Proposed Development. For both phases, the type, source and significance of potential impacts were identified, and the measures that should be employed to minimise these proposed.</p>
<p>Summary</p>	<p>The assessment of construction phase impacts associated with fugitive dust and fine particulate matter of an aerodynamic diameter of less than 10 microns (PM₁₀ and PM_{2.5}) emissions has been undertaken in line with the relevant Institute of Air Quality Management (IAQM) guidance. This identified that there is a low risk of dust soiling impacts and a negligible risk of increases in particulate matter concentrations. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and particulate matter releases would be significantly reduced. The residual effects of the construction phase on air quality are considered to be not significant.</p> <p>Potential impacts during the operational phase of the Proposed Development may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the Site. These were assessed against screening criteria provided within the EPUK/IAQM guidance. Due to the nature of the Proposed Development, operational phase road traffic exhaust emissions are considered to be not significant.</p>
<p>Conclusions and Recommendations</p>	<p>Based on the results of the assessment and the implementation of the proposed mitigation measures, it is considered that, the Proposed Development complies with national and local planning policies and there are no air quality constraints considered to restrict planning consent.</p>
<p>This is intended as a summary only. Further detail and limitations of the assessment is provided within the main body of the Report.</p>	

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1.0 Introduction

1.1 Appointment

- 1.1.1 Lucion Delta-Simons Ltd (“Lucion”) was instructed by MARS Cares & Treats (the 'Client') to undertake an Air Quality Assessment in support of a planning application for a proposed ammonia plant (the 'Proposed Development') at MARS Cares & Treats, Birstall (the 'Site').
- 1.1.2 Reference should be made to **Figure 1** for a map of the Site and surrounding area.

1.2 Site Location and Context

- 1.2.1 The Site is located in an industrial area with retail units to the north, east and south, and residential dwellings to the south-east.
- 1.2.2 The Proposed Development comprises a series of new chillers and associated pump skids in plant enclosures along with liquid coolers mounted above. These will reject waste heat to atmosphere and maintain process cooling to the facility. The chillers will utilise ammonia within a closed loop system with no point source emissions under normal operating conditions.
- 1.2.3 The Proposed Development has the potential to cause adverse impacts to existing pollution levels at nearby sensitive receptors as a result of fugitive dust emissions during construction and road vehicle exhaust emissions during operation. As such, an Air Quality Assessment is required to determine baseline conditions at the Site and to assess potential impacts associated with the Proposed Development, in accordance with the requirements of the National Planning Policy Framework (NPPF) (as amended 2025).
- 1.2.4 The main potential sources of air pollution were identified as emissions from road transport using the local road network. There are no combustion sources identified within the immediate vicinity of the Site that will influence the local air quality.
- 1.2.5 The report presents the findings of an assessment of the potential air quality impacts of the Proposed Development during both the construction and operational phases. For both phases, the type, source and significance of potential impacts are identified, and the measures that should be employed to minimise these described.
- 1.2.6 The standard limitations associated with this assessment are presented in **Appendix A**.
- 1.2.7 A glossary of terms used in this report is provided in **Appendix B**.

2.0 Legislation and Policy

2.1 Air Quality Legislation & Policy

2.1.1 A summary of the relevant air quality legislation and policy is provided below.

Air Quality Strategy (2023)

2.1.2 The Government's policy on air quality within England is set out in the Air Quality Strategy: Framework for Local Authority Delivery (AQS)¹. The AQS provides a framework for reducing air pollution in England.

2.1.3 The AQS sets standards and objectives for nine key air pollutants to protect health, vegetation and ecosystems. These are benzene (C₆H₆), 1,3 butadiene (C₄H₆), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO₂), particulate matter (PM₁₀ and PM_{2.5}), sulphur dioxide (SO₂), ozone (O₃), and polycyclic aromatic hydrocarbons (PAHs). The standards and objectives for the pollutants considered in this assessment are given in **Appendix C**.

2.1.4 The air quality standards are levels recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO) with regards to current scientific knowledge about the effects of each pollutant on health and the environment.

2.1.5 The air quality objectives are medium-term policy-based targets set by the Government, which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedances of the standard over a given period.

2.1.6 For the pollutants considered in this assessment, there are both long-term (annual mean) and short-term standards. In the case of NO₂, the short-term standard is for a 1-hour averaging period, whereas for PM₁₀ it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants, for example temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road.

2.1.7 The AQS contains a framework for considering the effects of a finer group of particles known as 'PM_{2.5}' as there is increasing evidence that this size of particles can be more closely associated with observed adverse health effects than PM₁₀. Local authorities are required to work towards reducing emissions/concentrations of particulate matter within their administrative area.

Environmental Improvement Plan (2023)

2.1.8 The Environmental Improvement Plan² was published in January 2023, providing long term and Interim Targets in order to reduce population exposure to PM_{2.5}. The Concentration Target for 2040 was subsequently adopted in the Environmental Targets (Fine Particulate Matter) (England) Regulations (2023).

Air Quality Regulations (2016)

2.1.9 Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000³ and the Air Quality (England) (Amendment) Regulations 2002⁴ for the purpose of Local Air Quality Management (LAQM).

2.1.10 These Regulations require that likely exceedances of the AQS objectives are assessed in relation to:

'[...] the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present [...]

¹ Air Quality Strategy: Framework for Local Authority Delivery, Defra, 2023.

² Defra (2023). Environmental Improvement Plan.

³ The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928.

⁴ The Air Quality (England) (Amendment) Regulations 2002 - Statutory Instrument 2002 No.3043.

- 2.1.11 The Air Quality Standards (Amendment) Regulations 2016⁵ amends the Air Quality Standards Regulations 2010 that transpose the European Union Ambient Air Quality Directive (2008/50/EC) into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as PM₁₀, PM_{2.5} and NO₂. The limit values for NO₂ and PM₁₀ are the same concentration levels as the relevant AQS objectives and the limit value for PM_{2.5} is a concentration of 25µg/m³.

Environmental Protection Act 1990 - Control of Dust and Particulates Associated with Construction

- 2.1.12 Section 79 of the Environmental Protection Act 1990 gives the following definitions of statutory nuisance relevant to dust and particles:

'Any dust, steam, smell or other effluvia arising from industrial, trade or business premises or smoke, fumes or gases emitted from premises so as to be prejudicial to health or a nuisance'; and

'Any accumulation or deposit which is prejudicial to health or a nuisance'.

- 2.1.13 Following this, Section 80 says that where a statutory nuisance is shown to exist, the local authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the local authority may abate the nuisance and recover expenses.
- 2.1.14 There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist. Nuisance is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred.

Environment Act 2021

- 2.1.15 Schedule 11 contains amendments of Part IV of the Environment Act 1995⁶ (air quality). Local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the Air Quality Objectives (AQOs) defined in the Regulations. There is a requirement for local authorities to identify relevant sources of emissions that are likely to be responsible for any failure to achieve the AQOs within the area of jurisdiction, or to identify relevant sources within neighbouring authorities and to identify them. Where the objectives are not likely to be achieved, within the relevant period, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

Clean Air Strategy (2019)

- 2.1.16 In 2019, the UK government released its Clean Air Strategy 2019⁷, part of its 25 Year Environment Plan. The Strategy sets out the comprehensive action that is considered to be required from across all parts of government and society.
- 2.1.17 The primary focus of air quality management has primarily related to NO₂, and its principal source in the UK, road traffic. The 2019 Strategy aims to broaden the focus to other areas, including actions on clean growth, and emissions from domestic wood burning stoves, industry and agriculture.

2.2 Planning Policy

- 2.2.1 A summary of the national and local planning policy relevant to the Proposed Development and air quality is provided below.

⁵ The Air Quality Standards (Amendment) Regulations 2016 - Statutory Instrument 2016 No. 1184.

⁶ Environment Act 2021 [Online] Available at: https://www.legislation.gov.uk/ukpga/2021/30/pdfs/ukpga_20210030_en.pdf?timeline=false.

⁷ Department of Environment, Food and Rural Affairs (Defra) (2019). Clean Air Strategy 2019.

National Planning Policy

National Planning Policy Framework (NPPF) (as amended 2025)

2.2.2 The Government's overall planning policies for England are described in the NPPF⁸. The core underpinning principle of the Framework is the presumption in favour of sustainable development, defined as:

'[...] meeting the needs of the present without compromising the ability of future generations to meet their own needs.'

2.2.3 One of the three overarching objectives of the NPPF is that planning should 'contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.'

2.2.4 In relation to air quality, the following paragraphs in the document are relevant:

- Paragraph 55, which states 'Local planning authorities should consider whether otherwise unacceptable development could be made acceptable through the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.';
- Paragraph 109, which states 'Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.';
- Paragraph 180, which states 'Planning policies and decisions should contribute to and enhance the natural and local environment by: [...] e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.';
- Paragraph 191, which states 'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.';
- Paragraph 192, which states 'Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan.'; and
- Paragraph 194, which states 'The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities'.

⁸ Department for Levelling up, Housing & Communities (2025) NPPF.

Local Planning Policy

- 2.2.5 A summary of relevant local policies is outlined below, however their compliance and soundness in relation to national policy has not been assessed in this instance.

Kirklees Local Plan (2019)

- 2.2.6 The Kirklees Local Plan⁹ was adopted by Kirklees Council (KC) on 27th February 2019. Review of the document indicated the following policies of relevance to this assessment:

'Policy LP47 - Healthy, active and safe lifestyles

The council will, with its partners, create an environment which supports healthy, active and safe communities and reduces inequality.

Healthy, active and safe lifestyles will be enabled by:

[...]

g. ensuring that the current air quality in the district is monitored and maintained and, where required, appropriate mitigation measures included as part of new development proposals;

[...]

'Policy LP51 - Protection and improvement of local air quality

1. Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air pollution which would have an unacceptable impact on the natural or built environment or to people.

2. Proposals that have the potential to increase local air pollution either individually or cumulatively must be accompanied by evidence to show that the impact of the development has been assessed in accordance with the relevant guidance. Development which has the potential to cause levels of local air pollution to increase must incorporate sustainable mitigation measures that reduce the level of this impact. If sustainable measures cannot be introduced the development will not be permitted.

3. Where the development introduces new receptors into Air Quality Management Areas or Areas of Concern or near other areas of relatively poor air quality, for example near roads or junctions, the development must incorporate sustainable mitigation measures that protect the new receptors from unacceptable levels of air pollution. Where sustainable mitigation measures cannot be introduced which prevent receptors from being exposed to unsafe levels of air pollution, development will not be permitted.'

- 2.2.7 The above policies were considered as necessary throughout the undertaking of the assessment.

2.3 Guidance

- 2.3.1 A summary of the publications referred to in the undertaking of this assessment is provided below.

Local Air Quality Management Technical Guidance (August 2022)

- 2.3.2 The Department for Environment, Food and Rural Affairs (Defra) has published technical guidance for use by local authorities in their review and assessment work¹⁰. This guidance, referred to in this document as Local Air Quality Management Technical Guidance (LAQM.TG22), has been used where appropriate in the assessment presented herein.

⁹ Kirklees Local Plan, KC, 2019.

¹⁰ Department for Environment, Food and Rural Affairs (Defra) (2022) Part IV of the Environment Act 1995 as amended by the Environment Act 2021 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Technical Guidance LAQM.TG22.

Land-Use Planning & Development Control: Planning for Air Quality (2017)

- 2.3.3 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have published guidance¹¹ that offers comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and, the possible mitigation measures that may be implemented to minimise these impacts.

Guidance on the Assessment of Dust from Demolition and Construction V2.2 (2024)

- 2.3.4 This document¹² published by the IAQM was produced to provide guidance to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM₁₀ impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

National Planning Practice Guidance - Air Quality (2019)

- 2.3.5 This guidance¹³ provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality, it explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account by local authorities in both the wider planning context of Local Plans and neighbourhood planning, and in individual cases where air quality is a consideration in a planning decision.

West Yorkshire Technical Planning Guidance

- 2.3.6 The West Yorkshire LAs have produced the Air Quality and Emissions: Technical Planning Guidance¹⁴ as part of an overarching Low Emission Strategy (LES) to reduce road transport emissions in the county. It is aimed at helping LAs deliver AQO compliance through cost effective service planning brought about by the joint working group and relevant Local Plan policies and was taken into consideration throughout the undertaking of this assessment.

¹¹ Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality.

¹² Institute of Air Quality Management (Version 2.2 Updated January 2024). Guidance on the Assessment of Dust from Demolition and Construction.

¹³ Department of Communities and Local Government (DCLG) (updated November 2019). National Planning Practice Guidance.

¹⁴ Air Quality and Emissions: Technical Planning Guidance, West Yorkshire Low Emissions Group, 2014.

3.0 Scope & Methodology

3.1 Scope

3.1.1 The scope of the assessment has been determined in the following way:

- Review of Council's latest available review and assessment report¹⁵ and air quality data for the area surrounding the Site, including data from the Council, DEFRA¹⁶ and the Environment Agency (EA)¹⁷; and,
- Desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality.

3.1.2 The scope of the assessment includes consideration of the potential impacts on local air quality resulting from:

- Dust and particulate matter generated by on-site activities during the construction phase;
- Increases in pollutant concentrations as a result of exhaust emissions arising from construction traffic and plant; and,
- Increases in pollutant concentrations as a result of exhaust emissions arising from traffic generated by the Proposed Development once operational.

3.2 Methodology

Construction Phase

3.2.1 Dust comprises particles typically in the size range 1-75 micrometres (μm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited in close proximity to the source of emission. Dust therefore, is unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.

3.2.2 The smaller particles of dust, are known as particulate matter (PM), with less than $10\mu\text{m}$ in aerodynamic diameter (PM_{10}) representing only a small proportion of total dust released; this includes a finer fraction, known as $\text{PM}_{2.5}$ (with an aerodynamic diameter less than $2.5\mu\text{m}$). As these particles are at the smaller end of the size range of dust particles they remain suspended in the atmosphere for a longer period of time than the larger dust particles, they can therefore be transported by wind over a wider area. PM_{10} and $\text{PM}_{2.5}$ are small enough to be drawn into the lungs during breathing, which in sensitive members of the public could have a potential impact on health. However, it is worth noting that, according to the IAQM guidance, the majority of fugitive particulate emissions arising from construction sites are expected to relate to the coarser fractions (i.e. $\text{PM}_{2.5-10}$) with just 10-15% expected to comprise $\text{PM}_{2.5}$. The IAQM guidance therefore focusses on PM_{10} for the purposes of assessment.

3.2.3 An assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM_{10} during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM; the available information for this phase of the Proposed Development provided by the Client and Project Team; and professional judgement.

3.2.4 The IAQM methodology assesses the risk of potential dust and PM_{10} impacts from the following four sources: demolition, earthworks; general construction activities and track-out. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM_{10} levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined. A summary of the IAQM assessment methodology is provided in **Appendix D**.

¹⁵ 2024 Air Quality Annual Status Report, KC, 2024.

¹⁶ Defra Local Air Quality Management (LAQM) Support Pages. Available at: <http://laqm.defra.gov.uk/> [Accessed on 16/04/2020].

¹⁷ <https://data.gov.uk/dataset/cfd94301-a2f2-48a2-9915-e477ca6d8b7e/pollution-inventory> [Accessed on 16/04/2020].

3.2.5 In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the application Site and in the vicinity of the Application Site itself. As information on the number of vehicles and plant associated with the construction phase was not available at the time of writing, a qualitative assessment of their impact on local air quality has been undertaken using professional judgement and by considering the following:

- The number and type of construction traffic and plant likely to be generated by this phase of the Development;
- The number and proximity of sensitive receptors to the application Site and along the likely routes to be used by construction vehicles; and,
- The likely duration of the construction phase and the nature of the construction activities undertaken.

Operational Phase Assessment

3.2.6 Of the pollutants included in the AQS, concentrations of NO₂ and particulate matter (PM₁₀ and PM_{2.5}) have been considered in this assessment as road traffic is a major source of these pollutants and their concentrations tend to be close to, or in exceedance of, the objectives in urban locations.

3.2.7 The development has the potential to increase concentrations of NO₂, PM₁₀ and PM_{2.5} as a result of road traffic exhaust emissions associated with vehicles travelling to and from the site during the operational phase. An assessment was therefore undertaken using the criteria contained within the IAQM 'Land-Use Planning & Development Control: Planning for Air Quality'¹⁸ guidance to determine the potential for trips generated by the development to affect local air quality.

3.2.8 The following criteria are provided to help establish when an assessment of potential impacts on the local area is likely to be considered necessary:

A. If any of the following apply:

- 10 or more residential units or a site area of more than 0.5ha; or,
- More than 1000m² of floor space for all other uses or a site area greater than 1ha.

B. Coupled with any of the following:

- The development has more than 10 parking spaces; or,
- The development will have a centralised energy facility or other centralised combustion process.

3.2.9 Should these criteria not be met, then the IAQM guidance considers air quality impacts associated with a scheme to be **not significant** and no further assessment is required.

Selection of Background Concentrations

3.2.10 Background pollutant data for the operational phase assessment have been taken from the national maps provided on the Defra website¹⁹, where background concentrations of those pollutants included within the AQS have been mapped at a grid resolution of 1x1km for the whole of the UK. Estimated background concentrations are available for all years between 2021 and 2040. The assessment utilises the background pollutant concentration for 2025.

¹⁸ Environmental Protection UK and Institute of Air Quality Management (Version 1.2 Updated January 2017). Land Use Planning & Development Control: Planning for Air Quality.

¹⁹ Department for Environment, Food and Rural Affairs (Defra) (2023) Background Concentrations [Online] Available at: <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2021>.

3.3 Selection of Sensitive Receptors

3.3.1 Sensitive locations are places where the public or sensitive ecological habitats may be exposed to pollutants resulting from activities associated with the Proposed Development. These will include locations sensitive to an increase in dust deposition and PM₁₀ exposure as a result of on-site construction activities, and locations sensitive to exposure to gaseous pollutants emitted from the exhausts of construction and operational traffic associated with the Proposed Development.

Construction Phase

3.3.2 The IAQM assessment is undertaken where there are: 'human receptors' within 250m of the Site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance(s); and/or 'ecological receptors' within 50m of the Site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 250m from the Site entrance(s). It is within these distances that the impacts of dust soiling and increased particulate matter in the ambient air will have the greatest impact on local air quality at sensitive receptors.

3.4 Significance criteria

Construction Phase

3.4.1 The IAQM assessment methodology recommends that significance criteria is only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be **negligible**.

3.4.2 For the assessment of the impact of exhaust emissions from plant used on-site and construction vehicles accessing and leaving the Site on local concentrations of NO₂ and particulate matter, the significance of residual effects has been determined using professional judgement and the principles outlined in the EPUK/IAQM guidance.

Operational Phase

3.4.3 The EPUK/IAQM guidance states that an assessment must reach a conclusion on the likely significance of the predicted impact. It should be noted that this is a binary judgement of either it is **significant** or it is **not significant**.

4.0 Baseline

4.1 Introduction

4.1.1 Existing air quality conditions in the vicinity of the Site were identified in order to provide a baseline for consideration. These are detailed in the following sections.

4.2 Local Air Quality Management

4.2.1 According to the latest Air Quality Annual Status Report from the Council²⁰ annual mean NO₂ and 24-hour mean PM₁₀ concentrations are above the relevant AQOs within the borough. As such, ten AQMAs have been declared. The closest of these to the site is described as follows:

'AQMA 4 - Birkenshaw - The designated area incorporates Bradford Road (A651), Whitehall Road East (A58), Carlton Court, Grove Terrace, Swincliffe Crescent, Milford Grove, Tetley Drive and Manor Park Gardens, which is in close proximity to the M62 and A651- A58 Roundabout at Birkenshaw.'

4.2.2 The Proposed Development is located approximately 2.4km east of the AQMA. It is not considered likely that the development would significantly affect air quality over a distance of this magnitude. As such, the designation has not been considered further in the context of the assessment.

4.2.3 KC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs. As such, no further AQMAs have been designated.

4.3 Local Emission Sources

4.3.1 The Site is located in an area where air quality is mainly influenced by industrial pollution sources and emissions from road transport using the local road network.

4.4 Air Quality Monitoring

4.4.1 Monitoring of pollutant concentrations is undertaken by the Council throughout their area of jurisdiction utilising continuous and passive methods. Recent diffusion tube monitoring results recorded in the vicinity of the development are shown in **Table 1**.

Table 1 - Diffusion Tube Monitoring Results

Monitoring Site			Monitored NO ₂ Concentration (µg/m ³)			
ID	Location	Type	2020	2021	2022	2023
K18	Huddersfield Road, Lamppost 246	Roadside	32.2	35.8	34.4	30.2
K29	LC255 Gelderd Road Birstall ^(a)	Roadside	-	-	-	29.6
K79	Gelderd Road, Birstall	Roadside	30.2	33.2	31.5	28.3
K81	Gelderd Road, Hawthorne House, Lamppost 276	Roadside	28.4	29.5	28.2	27.2

Note: (a) Monitor commissioned in 2023.

4.4.2 As shown in **Table 1**, the annual mean NO₂ concentration was below the AQO of 40µg/m³ at all monitoring locations in recent years. Reference should be made to **Figure 1** for a map of the diffusion tube positions.

²⁰ 2024 Air Quality Annual Status Report, KC, 2024.

4.4.3 It is noted that pollutant concentrations recorded during 2020 and 2021 were affected by changes to travel patterns associated with the COVID-19 pandemic. The results should therefore be viewed with caution. However, data for 2022 and beyond is now considered representative of post-pandemic conditions. This is supported by the IAQM²¹, who have adopted the following position:

'ambient air quality monitoring data for the year 2022 and beyond is generally considered to represent the current post-pandemic baseline.'

4.4.4 There are no automatic monitoring locations located in the vicinity of the Site. Additionally, KC do not undertake monitoring of PM₁₀ or PM_{2.5} concentrations within the vicinity of the Site.

4.5 Background Pollutant Concentrations

4.5.1 Predictions of background pollutant concentrations on a 1km by 1km grid basis have been produced by Defra for the entire of the UK to assist Local Authorities in their Review and Assessment of air quality. Data for the assessment extents was downloaded from the Defra website²² for the purpose of the project. This data is summarised in **Table 2** below.

Table 2 - Predicted Background Pollutant Concentrations (2025)

OS Grid Reference (X, Y; m)	NO ₂	NO _x	PM ₁₀	PM _{2.5}
423500, 427500	20.97	15.38	13.95	7.21

4.5.2 As shown in **Table 2**, predicted background NO₂ and PM₁₀ concentrations are below the relevant AQOs and Concentration Target across the Site.

²¹ Use of 2020 and 2021 Monitoring Datasets - IAQM Position Statement V1.1, IAQM, 2023.

²² <https://uk-air.defra.gov.uk/data/iaqm-background-maps?year=2021>.

5.0 Assessment

5.1 Introduction

5.1.1 There is the potential for air quality impacts as a result of the construction and operation of the Proposed Development. These are assessed in the following sections.

5.2 Construction Phase Assessment

Dust and PM₁₀ Arising from On-Site Activities

5.2.1 Construction activities that have the potential to generate and/or re-suspend dust and PM₁₀. include:

- Site clearance and preparation including demolition activities;
- Preparation of temporary access/egress to the Site and haulage routes;
- Earthworks;
- Materials handling, storage, stockpiling, spillage and disposal;
- Movement of vehicles and construction traffic within the Site (including excavators and dumper trucks);
- Use of crushing and screening equipment/plant;
- Exhaust emissions from plant, especially when used at the extremes of their capacity and during mechanical breakdown;
- Construction of buildings, roads and areas of hardstanding alongside fabrication processes;
- Internal and external finishing and refurbishment;
- Trackout, whereby earth is carried from the Site on vehicle tyres, deposited on roads and may later become suspended in the air as a result of vehicle movements; and
- Site landscaping after completion.

5.2.2 The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g. exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

Assessment of Potential Dust Emission Magnitude

5.2.3 The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM₁₀ sources: demolition, earthworks; construction; and, trackout. The findings of the assessment are presented below.

Demolition

5.2.4 The construction material to be removed will have low potential for dust release, the potential dust emission magnitude is considered to be **small** for demolition.

Earthworks

5.2.5 The total area of the Site is less than 18,000m². As such, the potential dust emission magnitude is considered to be **small** for earthworks.

Construction

5.2.6 The total volume of buildings to be constructed on the Site is less than 12,000m³. As such, the potential dust emission magnitude is considered to be **small** for construction.

Trackout

- 5.2.7 Information on the number of HDVs associated with this phase of the Proposed Development is not available and therefore professional judgement has been used. It has been assumed that given the size of the development area there are likely to be less than 20 HDV outward movements in any one day, with the unpaved road length in the Site less than 50m. It is therefore considered that the potential dust emission magnitude is **small** for trackout.
- 5.2.8 **Table 3** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

Table 3 - Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	Small
Earthworks	Small
Construction	Small
Trackout	Small

Assessment of Sensitivity of the Study Area

- 5.2.9 A windrose generated using the meteorological data is provided in **Appendix E**. This shows that the prevailing wind direction is predominantly from the west. Therefore, receptors located to the east of the Site are more likely to be affected by dust and particulate matter emitted and re-suspended during the construction phase.
- 5.2.10 Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. Receptors east of the Site are expected to be affected the most as a result of the prevailing wind direction. It has been assumed that the construction traffic will access the Site along Oakwell Way.
- 5.2.11 There are no ecological receptors within 50m of the development boundary or the access route within 250m of the site entrance. As such, ecological impacts have not been assessed further within this report.
- 5.2.12 Taking the above into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM₁₀ has been derived for each of the construction activities considered. The results are shown in **Table 4**.

Table 4 - Sensitivity of the Study Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Medium	Medium	Medium	Medium
Human Health	Low	Low	Low	Low

Risk of Impacts

- 5.2.13 The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 5** below provides a summary of the risk of dust impacts for the Proposed Development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 5 - Summary Dust Risk Table to Define Site Specific Mitigation

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	Low	Low	Low	Low
Human Health	Negligible	Negligible	Negligible	Negligible

Construction Vehicles & Plant

- 5.2.14 The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the Site access. Construction traffic will access the Site via Oakwell Way. Due to the size of the Site, it is considered likely that the construction traffic will be low in comparison to the existing traffic flows on these roads.
- 5.2.15 Final details of the exact plant and equipment likely to be used on-site will be determined by the appointed contractor, it is considered likely to comprise dump trucks, tracked excavators, diesel generators, asphalt spreaders, rollers, compressors and trucks. The number of plant and their location within the Site are likely to be variable over the construction period.
- 5.2.16 Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, and the likely numbers of construction vehicles and plant that will be used, the impacts are therefore considered to be **negligible** according to the assessment significance criteria.

5.3 Operational Phase Assessment

- 5.3.1 Vehicle movements associated with the operation of the proposal will generate exhaust emissions on the local and regional road networks. An assessment was therefore undertaken using the screening criteria as detailed in Section 3.2.8.
- 5.3.2 The Proposed Development does not include more than 1,000m² of floor space and the Site area is less than 1ha. In addition, no car parking spaces are proposed.
- 5.3.3 Based on the above information, potential air quality impacts associated with the operational phase of the development are predicted to be **not significant**, in accordance with the IAQM screening criteria.
- 5.3.4 Based on the assessment results, the Site is considered suitable for the Proposed Development without the implementation of mitigation measures.

5.4 West Yorkshire Technical Planning Guidance

- 5.4.1 The West Yorkshire LAs have produced Air Quality and Emissions: Technical Planning Guidance²³ as part of an overarching LES to reduce road transport emissions in the county. It is aimed at helping LAs deliver AQO compliance through cost effective service planning brought about by the joint working and relevant Local Plan policies.
- 5.4.2 The guidance provides a methodology for determining the scale of a development as minor, medium or major and the required air quality mitigation for the relevant banding. Review of the relevant criteria indicated the proposals were classified as **minor** under the following categories:
- General Industry (other than B1).

²³ Air Quality and Emissions: Technical Planning Guidance, West Yorkshire Low Emissions Group, 2014.

5.4.3 The guidance²⁴ provides a number of mitigation options that should be considered for inclusion within **minor** developments. The Proposed Development does not include any car parking provision therefore Electric Vehicle (EV) charging is not considered necessary. However, it is recommended that adherence to the IAQM²⁵ guidance for all demolition and construction works is completed in accordance with the requirements of the guidance²⁶.

²⁴ Air Quality and Emissions: Technical Planning Guidance, West Yorkshire Low Emissions Group, 2014.

²⁵ Institute of Air Quality Management (Version 2.2 Updated January 2024). Guidance on the Assessment of Dust from Demolition and Construction

²⁶ Air Quality and Emissions: Technical Planning Guidance, West Yorkshire Low Emissions Group, 2014.

6.0 Mitigation and Residual Effects

6.1 Construction Phase

Mitigation

6.1.1 Based on the assessment results, mitigation will be required during the construction phase of the Proposed Development. Recommended mitigation measures are given below.

General Communication

- The name and contact details of person(s) accountable for air quality and dust issues should be displayed on the Site boundary. This may be the environment manager/engineer or the site manager. The head or regional office contact information should also be displayed.

Site Management

- All dust and air quality complaints should be recorded and causes identified. Appropriate remedial action should be taken in a timely manner with a record kept of actions taken including of any additional measures put in-place to avoid reoccurrence.
- The complaints log should be made available to the Local Authority on request.
- Any exceptional incidents that cause dust and/or air emissions, either on or off-site should be recorded, and then the action taken to resolve the situation recorded in the log book.

Monitoring

- Carry out regular site inspections to monitor compliance with the DMP, record inspection results, and make an inspection log available to the local authority when asked.
- Increase the frequency of site inspections by the person accountable for air quality and dust issues on site when activities with a high potential to produce dust are being carried out and during prolonged dry or windy conditions.

Preparing and maintaining the Site

- Plan the Site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Where practicable, erect solid screens or barriers around dusty activities or the Site boundary that are at least as high as any stockpiles on-site.
- Avoid Site runoff of water or mud.

Operating vehicle/machinery and sustainable travel

- Ensure all vehicle operators switch off engines when stationary - no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.

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.
- Ensure an adequate water supply on the Site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

Waste management

- Avoid bonfires and burning of waste materials.

6.1.2 Detailed mitigation measures to control construction traffic should be discussed with the Local Authority to establish the most suitable access and haul routes for the site traffic. The most effective mitigation will be achieved by ensuring that construction traffic does not pass along sensitive roads (residential roads, congested roads, via unsuitable junctions, etc.) where possible, and that vehicles are kept clean (through the use of wheel washers, etc.) and sheeted when on public highways. Timing of large-scale vehicle movements to avoid peak hours on the local road network will also be beneficial.

Residual Effects

6.1.3 The residual effects of dust and PM₁₀ generated by construction activities following the application of the mitigation measures described above and good site practice is considered to be **not significant**.

6.1.4 The residual effects of emissions to air from construction vehicles and plant on local air quality is considered to be **not significant**.

6.2 Operational Phase

Mitigation

6.2.1 The changes in pollutant concentrations attributable to traffic emissions associated with the operational phase of the Proposed Development (i.e. impacts on local air quality) are **negligible** and therefore in accordance with the assessment criteria, mitigation is not required.

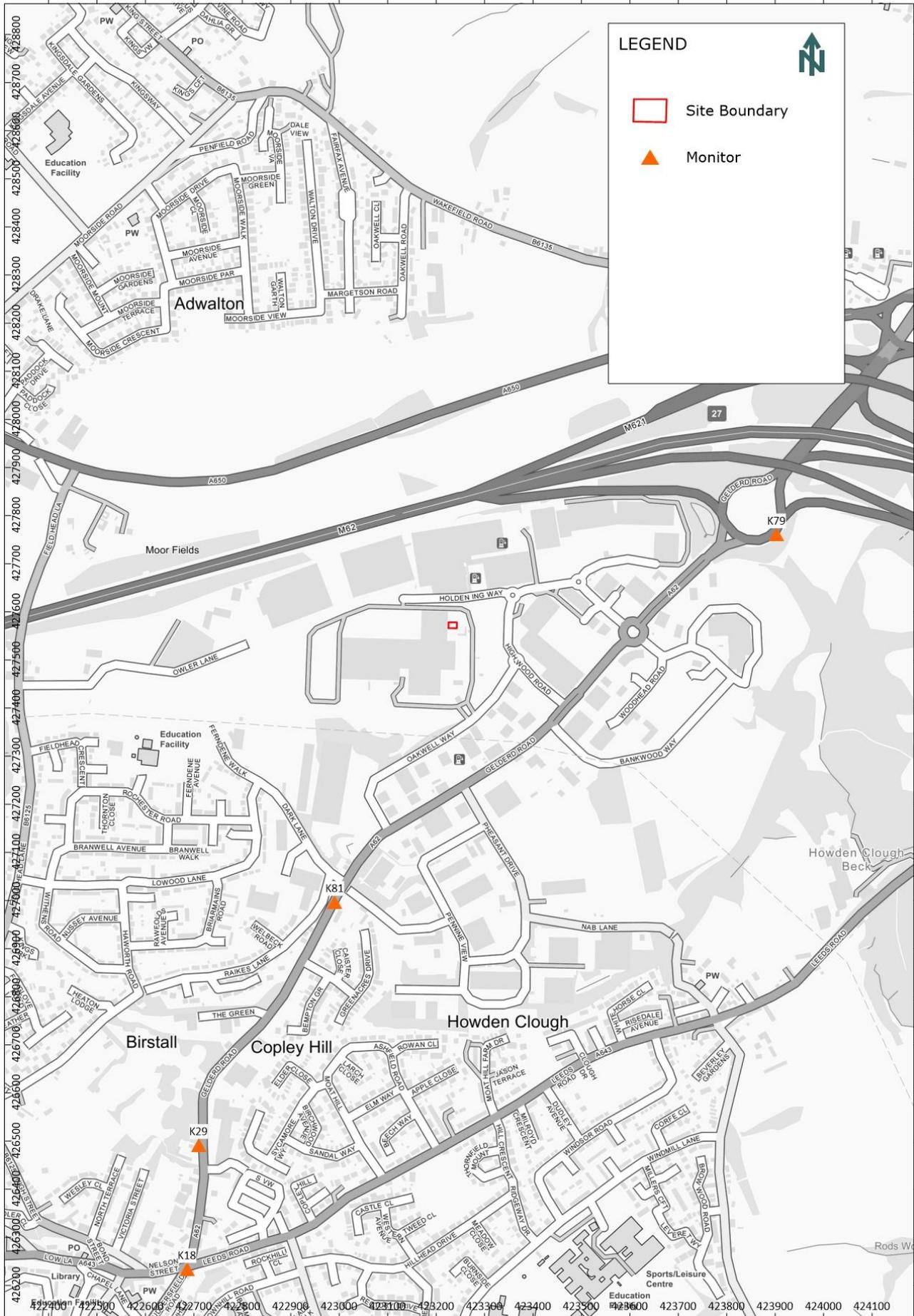
Residual Effects

6.2.2 The residual effects of emissions to air from vehicle movements associated with the operation of the Proposed Development on air quality is considered to be **not significant** for NO₂, PM₁₀ and PM_{2.5} according to the EPUK/IAQM assessment criteria.

7.0 Summary and Conclusions

- 7.1.1 Lucion has been appointed to prepare this Air Quality Assessment in support of the planning application for a proposed ammonia plant at MARS Cares & Treats, Birstall.
- 7.1.2 A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for this phase of the Proposed Development using the IAQM methodology. This identified that there is a **low** risk of dust soiling impacts and a **negligible** risk of increases in particulate matter concentrations. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and PM₁₀ releases would be significantly reduced. The residual effects of dust and PM₁₀ generated by construction activities on air quality are therefore considered to be **not significant**. The residual effects of emissions to air from construction vehicles and plant on local air quality is considered to be **not significant**.
- 7.1.3 The Site lies within an area where air quality is mainly influenced by emissions associated with traffic along the local road network. Pollutants considered in this assessment were NO₂ and Particulate Matter (PM₁₀ and PM_{2.5}).
- 7.1.4 Potential impacts during the operational phase of the Proposed Development may occur due to road traffic exhaust emissions associated with vehicles travelling to and from the Site. These were assessed against screening criteria provided within the EPUK/IAQM guidance. Due to the nature of the Proposed Development, operational phase road traffic exhaust emissions are considered to be **not significant**.
- 7.1.5 Based on the assessment significance criteria, the residual effects of the Proposed Development are considered to be **not significant** for all pollutants assessed.
- 7.1.6 Furthermore, it is considered that the Proposed Development complies with national and local policy for air quality.
- 7.1.7 Based on the assessment results, air quality issues are not considered a constraint to planning consent.

Figure 1 – Site Location Plan



Appendix A - Limitations

Limitations

The recommendations contained in this Report represent Lucion's professional opinions, based upon the information listed in the Report, exercising the duty of care required of an experienced Environmental Consultant. Lucion does not warrant or guarantee that the Site is free of hazardous or potentially hazardous materials or conditions.

Lucion obtained, reviewed and evaluated information in preparing this Report from the Client and others. Lucion's conclusions, opinions and recommendations has been determined using this information. Lucion does not warrant the accuracy of the information provided to it and will not be responsible for any opinions which Lucion has expressed, or conclusions which it has reached in reliance upon information which is subsequently proven to be inaccurate.

This Report was prepared by Lucion for the sole and exclusive use of the Client and for the specific purpose for which Lucion was instructed. Nothing contained in this Report shall be construed to give any rights or benefits to anyone other than the Client and Lucion and all duties and responsibilities undertaken are for the sole and exclusive benefit of the Client and not for the benefit of any other party. In particular, Lucion does not intend, without its written consent, for this Report to be disseminated to anyone other than the Client or to be used or relied upon by anyone other than the Client. Use of the Report by any other person is unauthorised and such use is at the sole risk of the user. Anyone using or relying upon this Report, other than the Client, agrees by virtue of its use to indemnify and hold harmless Lucion from and against all claims, losses and damages (of whatsoever nature and howsoever or whensoever arising), arising out of or resulting from the performance of the work by the Consultant.

Appendix B - Glossary

Glossary

Term	Definition
AADT Annual Average Daily Traffic	A daily total traffic flow (24hrs), expressed as a mean daily flow across all 365 days of the year.
Adjustment	Application of a correction factor to modelled results to account for uncertainties in the model
Accuracy	A measure of how well a set of data fits the true value.
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedances within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant for one year.
AQMA	Air Quality Management Area.
AQO	Air Quality Objective.
AQS	Air Quality Strategy.
AURN	Automatic Urban and Rural (air quality monitoring) Network, managed by contractors on behalf of Defra.
Defra	Department for Environment, Food and Rural Affairs.
EPAQS	Expert Panel on Air Quality Standards.
EPUK	Environmental Protection (UK).
Exceedance	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
IAQM	Institute of Air Quality Management.
KC	Kirklees Council.
LAQM	Local Air Quality Management.
LES	Low Emission Strategy.
NO ₂	Nitrogen dioxide.

NO _x	Nitrogen oxides.
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5 micrometres.
WHO	World Health Organisation
µg/m ³ microgrammes per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of 1µg/m ³ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Appendix C - Relevant UK Air Quality Strategy Objectives

Relevant UK Air Quality Strategy Objectives

National Air Quality Objectives and European Directive Limit Values for the Protection of Human Health						
Pollutant	Applies To	Objective	Measured As	Date to be achieved by and maintained thereafter	European Obligations	Date to be achieved by and maintained thereafter
Nitrogen dioxide (NO ₂)	UK	40µg/m ³	annual mean	31.12.2005	40µg/m ³	01.01.2010
	UK	200µg/m ³ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005	200µg/m ³ not to be exceeded more than 18 times a year	01.01.2010
Particulate Matter (PM ₁₀) (gravimetric) ^A	UK (except Scotland)	40µg/m ³	annual mean	31.12.2005	40µg/m ³	01.01.2010
	UK (except Scotland)	50µg/m ³ not to be exceeded more than 35 times a year	24-hour mean	31.12.2004	50µg/m ³ not to be exceeded more than 35 times a year	01.01.2005
Particulate Matter (PM _{2.5})	UK (except Scotland)	20µg/m ³	annual mean	2020	Particulate Matter (PM _{2.5})	UK (except Scotland)
	England	12µg/m ³ *	annual mean	31.01.2028		England
	England	10µg/m ³ *	annual mean	2040		England

^A Measured using the European gravimetric transfer sampler or equivalent

µg/m³ = microgram per cubic metre

*Target – not legally binding

Appendix D - IAQM Construction Assessment Methodology

IAQM Construction Assessment Methodology

Step 1 - Screening the Need for a Detailed Assessment

An assessment will normally be required where there are:

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

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

Step 2a - Define the Potential Dust Emission Magnitude

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

Table D1 - Examples of Potential Dust Emission Magnitude

Magnitude	Activity	Criteria
Large	Demolition	>75,000m ³ building demolished, dusty material (e.g. concrete), on-site crushing/screening, demolition >12m above ground level
	Earthworks	Total site area greater than 110,000m ² Potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size) More than 10 heavy earth moving vehicles active at any one time Formation of bunds greater than 8m in height More than 100,000 tonnes of material moved
	Construction	Total building volume greater than 75,000m ³ On-site concrete batching Sandblasting
	Trackout	More than 50 Heavy Duty Vehicle (HDV) trips per day Potentially dusty surface material (e.g. high clay content) Unpaved road length greater than 100m
Medium	Demolition	12,000 - 75,000m ³ building demolished, dusty material (e.g. concrete) 6-12m above ground level
	Earthworks	Total site area 18,000m ² to 110,000m ² ; Moderately dusty soil type (e.g. silt) 5 to 10 heavy earth moving vehicles active at any one time Formation of bunds 3m to 6m in height
	Construction	Total building volume 12,000m ³ to 75,000m ³ Potentially dusty construction material (e.g. concrete) On-site concrete batching
	Trackout	20 to 50 HDV trips per day Moderately dusty surface material (e.g. high clay content) Unpaved road length 50m to 100m
Small	Demolition	<20,000m ³ building demolished, non-dusty material (e.g. metal cladding), <10m above ground level, work during wetter months

Magnitude	Activity	Criteria
	Earthworks	Total site area less than 18,500m ² ; Soil type with large grain size (e.g. sand) Less than 5 heavy earth moving vehicles active at any one time Formation of bunds less than 3m in height
	Construction	Total building volume less than 12,000m ³ Construction material with low potential for dust release (e.g. metal cladding or timber)
	Trackout	Less than 20 HDV trips per day Surface material with low potential for dust release Unpaved road length less than 50m

Step 2b - Define the Sensitivity of the Area

The tables below present the IAQM assessment methodology to determine the sensitivity of the area to dust soiling, human health and ecological impacts respectively. The IAQM guidance provides guidance to allow the sensitivity of individual receptors to dust soiling and health effects to assist in the assessment of the overall sensitivity of the study area.

Table D2- Sensitivity of the Area to Dust Soiling Effects

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		<20	<50	<100	<250
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

Table D3 - Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentrations (µg/m ³)	Number of Receptors	Distance from the Source (m)			
			<20	<50	<100	<250
High	>32	>100	High	High	High	Medium
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28	>100	High	Medium	Low	Low

	<24	10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
		>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32	>10	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	28-32	>10	Medium	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24	>10	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

Table D4 - Sensitivity of the Area to Ecological Impacts

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

Step 2c - Define the Risk of Impacts

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts without mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table D5 - Risk of Dust Impacts

Sensitivity of Surrounding Area	Dust Emission Magnitude		
	Large	Medium	Small
Demolition			
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible
Earthworks, Construction and Trackout			
High	High Risk	Medium Risk	Low Risk
Medium	Medium Risk	Medium Risk	Low Risk
Low	Low Risk	Low Risk	Negligible

Step 3 - Site Specific Mitigation

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

Step 4 - Determine Significant Effects

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

Appendix E - Wind Rose for Leeds Bradford Airport (2023)

