



AIR QUALITY SCREENING ASSESSMENT

FOR

MAIZE SILO INSTALLATION,

HEINEKEN UK LIMITED, MANCHESTER

AQ4306

12/3/2021

Prepared For

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Manchester
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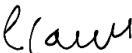
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Issue / Revision	Issue	Revision 1	Revision 2
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TABLE OF CONTENTS

TABLE OF CONTENTS	3
EXECUTIVE SUMMARY	4
1.0 INTRODUCTION.....	5
1.1 Background.....	5
1.2 Site Location and Context.....	5
1.3 Limitations	5
2.0 LEGISLATION, GUIDANCE AND POLICY	6
2.1 UK Legislation and Guidance	6
2.2 Local Planning Policy.....	7
3.0 METHODOLOGY	9
3.1 Construction Phase Assessment.....	9
3.2 Operational Phase Assessment	9
4.0 BASELINE	10
4.1 Local Air Quality Management	10
4.2 Air Quality Monitoring.....	10
4.3 Background Pollutant Concentrations.....	11
4.4 Sensitive Receptors.....	12
5.0 ASSESSMENT.....	13
5.1 Construction Phase Assessment.....	13
5.2 Operational Phase Assessment	15
6.0 CONCLUSION	17
7.0 ABBREVIATIONS.....	18
APPENDIX A - FIGURES.....	19
APPENDIX B – CONSTRUCTION PHASE ASSESSMENT CRITERIA	22
APPENDIX C – ASSESSOR CURRICULUM VITAE	28

EXECUTIVE SUMMARY

Ensafe Consultants were commissioned by Heineken UK to undertake an Air Quality Assessment in support of the proposed installation of 2 new 60 ton maize silos at Heineken Brewery, Denmark Road, Manchester.

The proposed development may cause air quality impacts at nearby sensitive receptors during the construction and operational phases. Impacts could arise as a result of additional fugitive dust emissions associated with construction activities, as well as road vehicle exhaust emissions and fugitive dust generated during operation.

An Air Quality Screening Assessment and Construction Dust Risk Assessment was produced to provide considerations to existing baseline conditions, assess site suitability for the proposed end-use and the significance of associated impacts and in accordance with the requirements of the National Planning Policy Framework and Manchester City planning policy.

Based on the screening results, air quality impacts at sensitive receptors are not likely to form a constraint to planning consent for the proposed development.

1.0 INTRODUCTION

1.1 Background

Ensafe Consultants has been commissioned by Heineken UK, hereafter referred to as “the Client” to undertake an Air Quality Screening Assessment in support of a proposed development, comprising of the installation of 2 new 60 ton maize silos, herein after referred to as the “Proposed Development”.

Given the nature of the proposed works, the development has potential to cause fugitive dust and road vehicle exhaust emission impacts on existing pollution levels as a result of importation and unloading of maize during the operation.

1.2 Site Location and Context

The application site is located in a predominantly residential area with surrounding commercial use, approximately 1.5 kilometres south of Manchester City Centre at Heineken Brewery, in an area bounded by Princess Road, Greenheys Lane, Charles Halle Road/Denmark Road and Moss Lane East. The site is located at approximate National Grid Reference (NGR) 383950, 396000. Reference should be made to Figure 1 within Appendix A for a location plan.

The application site is located within the Greater Manchester Air Quality Management Area (AQMA) which has been declared due to exceedances of the annual mean Air Quality Objective (AQO) for Nitrogen Dioxide (NO₂). The site is also located adjacent to the A5103, which is considered a notable source of emissions including Nitrogen Dioxide (NO₂) and Particulate Matter (PM₁₀ and PM_{2.5}).

The Proposed Development does not include any relevant exposure to long term pollutant concentrations, such as residential units. Given the use of the maize silos will be transient, considerations of annual mean NO₂ and PM concentrations across the Proposed Development is not required as in accordance with Local Air Quality Management Technical Guidance.

It is unlikely that associated trip generation or fugitive dust emissions associated with construction activities would result in significant impacts at nearby sensitive use. However, there is potential for impact to arise as a result of operational fugitive dust emission associated with the importation and storage of maize.

An Air Quality Screening Report has been produced to assess the potential for air quality impacts at sensitive receptors and assess site suitability for the proposed end-use. The assessment will be undertaken in accordance with the requirements of the National Planning Policy Framework (NPPF) and the Environmental Protection UK and Institute of Air Quality Management (IAQM) planning guidance.

1.3 Limitations

This report has been produced in accordance with Ensaf Consultants standard terms of engagement. Ensaf Consultants has prepared this report solely for the use of the Client and those parties with whom a warranty agreement has been executed, or with whom an assignment has been agreed. Should any third party wish to use or rely upon the contents of the report, written approval must be sought from Ensaf Consultants; a charge may be levied against such approval.

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2.0 LEGISLATION, GUIDANCE AND POLICY

The following legislation, guidance and policy will be considered and adhered to during the preparation of the Air Quality Assessment:

- European Union (EU) Directive 2008/50/EC;
- The National Planning Policy Framework (NPPF), updated on 19th February 2019);
- The National Planning Practice Guidance (NPPG), relevant chapters produced on 1st November 2019;
- Section 82 of the Environment Act (1995) (Part IV);
- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Department for Environment, Food and Rural Affairs, 2007¹
- The Air Quality Standards (Amendment) Regulations (2016)¹;
- Local Air Quality Management Technical Guidance 2016 LAQM.TG(16), DEFRA, 2018²;
- Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management (IAQM), v1.1, June 2016³;
- Guidance on the Assessment of Mineral Dust Impacts for Planning, Institute of Air Quality Management (IAQM), v1.1, May 2016⁴
- Land-Use Planning and Development Control: Planning for Air Quality, Environmental Protection UK and IAQM, January 2017⁵.
- Greater Manchester Air Quality Action Plan 2016-2021⁶

2.1 UK Legislation and Guidance

The Air Quality Standards (Amendment) Regulations (2016) came into force on 31st December 2016. These Regulations amend the Air Quality Standards Regulations 2010 and transpose the EU Directive 2008/50/EC into UK law. AQLVs were published in these regulations for 7 pollutants, as well as Target Values for an additional 6 pollutants.

Part IV of the Environment Act (1995) requires UK government to produce a national Air Quality Strategy (AQS) which contains standards, objectives, and measures for improving ambient air quality. The most recent AQS was produced by the Department for Environment, Food and Rural Affairs (DEFRA) and published in July 2007¹. The AQS sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. These are generally in line with the AQLVs, although the requirements for compliance vary slightly.

Table 1 presents the AQOs for pollutants considered within this assessment.

Table 1: Air Quality Objectives

Pollutant	Air Quality Objectives	
	Concentration ($\mu\text{g}/\text{m}^3$)	Averaging Periods
NO ₂	40	Annual mean
	200	1-hour mean; not to be exceeded more than 18 times a year
PM ₁₀	40	Annual mean
	50	24-hour mean; not to be exceeded more than 35 times a year
PM _{2.5}	25	Annual Mean

1 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, DEFRA, 2007
2 Local Air Quality Management Technical Guidance 2016 LAQM.TG(16), DEFRA, February 2018.
3 Guidance on the Assessment of Dust from Demolition and Construction, Institute of Air Quality Management, 2016.
4 Guidance on the Assessment of Mineral Dust Impacts for Planning, Institute of Air Quality Management, 2016.
5 Land-Use Planning and Development Control: Planning for Air Quality, EPUK and IAQM, January 2017.
6 Greater Manchester Air Quality Action Plan 2016-2021, Greater Manchester Combined Authority, 2016.

Table 2 summarises the advice provided in DEFRA guidance LAQM.TG(16)² on where the AQOs for pollutants considered within this report apply.

Table 2: Examples of Where the Air Quality Objectives Apply

Averaging Periods	Objectives Should Apply At	Objectives Should Not Apply At
Annual mean	All locations where members of the public might be regularly exposed Building façades of residential properties, schools, hospitals, care homes etc.	Building façades of offices or other places of work where members of the public do not have regular access Hotels, unless people live there as their permanent residence Gardens of residential properties Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
24-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties	Kerbside sites (as opposed to locations at the building façade), or any other location where public exposure is expected to be short term
1-hour mean	All locations where the annual mean and 24-hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more Any outdoor locations where members of the public might reasonably be expected to spend one hour or longer	Kerbside sites where the public would not be expected to have regular access

The results of the dispersion modelling assessment will also be compared against the relevant AQOs detailed in Table 1 to determine significance.

2.2 Local Planning Policy

2.2.1 The Manchester Local Development Framework (LDF) Core Strategy

The Manchester LDF Core Strategy⁷ 8.1.1 was formally adopted in 2012 and provides a framework for development within the City. The LDF comprises a number of documents which set out Manchester City Council's (MCC) spatial policy framework for delivering a number of policies contained within the Core Strategy which have been saved in accordance with the Planning and Compulsory Purchase Act (2004) and therefore provide the basis for the determination of planning applications prior to the finalisation of the local development framework.

A review of the Core Strategy indicated the following policy in relation to air quality that is relevant to this assessment:

- **Policy EN16 – Air Quality**

⁷ Manchester's Local Development Framework Core Strategy Development Plan Document, July 2012.

"The Council will seek to improve the air quality within Manchester, and particularly within Air Quality Management Areas, located along Manchester's principal traffic routes and at Manchester Airport. Developers will be expected to take measures to minimise and mitigate the local impact of emissions from traffic generated by the development, as well as emissions created by the use of the development itself, including from Combined Heat and Power and biomass plant.

When assessing the appropriateness of locations for new development the Council will consider the impacts on air quality, alongside other plan objectives. This includes cumulative impacts, particularly in Air Quality Management Areas."

- **Policy CC5 - Transport**

"Developers should work with public transport providers to ensure that all users are able to access development by sustainable means, especially taking account of times when developments are likely to be busiest."

- **Policy DM1 – Development Management**

" All development should have regard to the following specific issues for which more detailed guidance may be given within a supplementary planning document:

Effects on amenity, including privacy, light, noise, vibration, air quality, odours, litter, vermin, birds, road safety and traffic generation. This could also include proposals which would be sensitive to existing environmental conditions, such as noise."

Reference has been made to these policies during the undertaking of this Air Quality Assessment (AQA) by assessing pollutant concentrations across the Site and determining potential air quality impacts as a result of the Proposed Development.

2.2.2 Greater Manchester Air Quality Action Plan

The Greater Manchester Air Quality Action Plan (AQAP) has involved a review of the strategies, policies and plans which tackle or are in some way related to air quality, to develop a clear, robust, and meaningful set of actions which will deliver real changes in terms of air quality, whilst supporting the sustainable economic growth of the region.

The primary objectives of the AQAP are to improve air quality across Greater Manchester and to embed low-emission behaviours into the culture of our organisations and lifestyles by 2025, whilst supporting the UK Government in meeting all EU thresholds for key air pollutants. The Plan identifies 'Key Priority Areas' which are generally locations near to major roads and heavily trafficked areas in Manchester city centre, and other major urban centres across the other nine districts.

The AQAP comprises a single document including actions that will be ratified by Transport for Greater Manchester (TfGM) and district authorities to tackle air quality in Key Priority Areas, whilst supporting the sustainable economic growth of the region. This plan will allow councils to carry out their statutory duties under Part IV of the Environment Act 1995, as its implementation will help mandatory EU limit values to be met. Consideration to the action plan has been made throughout the preparation assessment.

Reference has been made to the AQAP when necessary during the undertaking of this Air Quality Assessment.

3.0 METHODOLOGY

There is the potential for the Proposed Development to cause impacts at sensitive locations during the construction and operational phases. Consultation with MCC was made on the 12/03/2021 to discuss the assessment scope and proposed methodology. No response was provided.

3.1 Construction Phase Assessment

During the construction phase of the proposed development, there is potential for air quality impacts as a result of fugitive dust emissions. IAQM Methodology 'Guidance on the Assessment of Dust from Demolition and Construction' will be used to conduct a screening assessment of fugitive dust emissions during the construction phase, alongside recommendations of control measures.

3.2 Operational Phase Assessment

3.2.1 EPUK and IAQM Impact Significant Criteria

Based on the details of the Proposed Development and anticipated trip generation a screening assessment in accordance with the EPUK and IAQM guidance⁵ was determined a suitable assessment approach. The assessment will determine road traffic exhaust and combustion emission impacts associated with the Proposed Development, and confirm the requirement for detailed assessment work.

The EPUK and IAQM document states the following criteria to help establish when an air quality assessment is likely to be considered necessary:

- Proposals that will cause a change in Light Duty Vehicle (LDV) flows of more than 100 AADT within or adjacent to an AQMA or more than 500 elsewhere;
- Proposals that will cause a change in Heavy Duty Vehicle (HDV) flows of more than 25 AADT within or adjacent to an AQMA or more than 100 elsewhere;
- Proposals which include either a centralised plant using biofuel, a combustion plant with single or thermal input >300KWh or a standby emergency generator associated with a centralised energy centre; and
- Proposals which include combustion processes of any size.

Should the above criteria not be met, the EPUK and IAQM document considers air quality impacts associated with the scheme to be not significant and no further assessment is required. Conversely, should the criterion be exceeded it may be deemed necessary that further assessment is required.

3.2.2 Fugitive Dust Screening Assessment

Based on the details of the Proposed Development and anticipated on-site activities during operation, a screening assessment in accordance with the IAQM guidance⁴ was determined to be a suitable assessment approach. The assessment will determine fugitive dust impacts associated with the Proposed Development, and confirm the requirement for detailed assessment work.

4.0 BASELINE

Existing air quality conditions in the vicinity of the application site were identified in order to provide a baseline for assessment. These are detailed in the following sections.

4.1 Local Air Quality Management

As required by the Environment Act (1995), MCC, has undertaken Review and Assessment of air quality within their area of administration. This process has indicated that annual mean concentrations of NO₂ are above the AQO within their administration. As such, one AQMA has been declared, being described as:

- "AQMA Greater Manchester – An Area covering the 10 districts of Greater Manchester, including arterial routes, district centres, and airport"

The application site is located within the AQMA. As such there is potential for the Proposed Development to cause air quality impacts within this sensitive area during the construction and operational phases. This has been considered within this report.

MCC has concluded that concentrations of all other pollutants considered within the AQS are currently below the relevant AQOs and as such no further AQMAs have been designated.

4.2 Air Quality Monitoring

Monitoring of pollutant concentrations is undertaken by MCC using continuous and passive methods throughout their areas of administration. A review of MCC's most recent Air Quality Monitoring Data⁸ indicated that there is currently one automatic analyser operated by MCC within the vicinity of the Proposed Development. Recent monitoring results from this location are shown in Table 3.

Table 3: Automatic Monitoring Results

ID	Site Name	Type	NGR (m)		Distance to Site (m)	Pollutant	Annual Mean Concentration (µg/m ³)		
			X	Y			2017	2018	2019
MAN1	Manchester Oxford Road	Kerbside	384233	397287	1,305	NO ₂	65	62	59
						PM ₁₀	27	30	26

As indicated in Table 3, there were exceedances of annual mean AQO for NO₂ or PM₁₀ at automatic monitoring station MAN1 in recent years.

MCC also monitor annual mean NO₂ concentrations across the borough using passive diffusion tubes. A review of the most recent air quality monitoring data indicated 3 diffusion tubes located within the vicinity of the application site, presented in Table 4.

Table 4: NO₂ Diffusion Tube Monitoring Results

ID	Site Name	Type	NGR (m)		Dist' to Site (m)	Annual Mean Concentration (µg/m ³)		
			X	Y		2017	2018	2019
MA82NO	82	Roadside	384233	397287	1,305	56.7	51.9	35.4
MA83NO	83	Roadside	384233	397287	1,305	55.1	52.5	30.6

⁸ Greater Manchester Combined Authority Annual Status Report 2019, June 2020.

ID	Site Name	Type	NGR (m)		Dist' to Site (m)	Annual Mean Concentration ($\mu\text{g}/\text{m}^3$)		
			X	Y		2017	2018	2019
MA84NO	84	Roadside	384233	397287	1,305	56.2	54.0	32.0

As indicated in Table 4, there were exceedances of annual mean AQO for NO_2 at diffusion tube locations 82 83 and 84 in recent years. During 2019 significant reductions to annual mean concentrations were apparent, with concentrations falling below the relevant AQO. This is like a result of the implementation of measures detailed in the AQAP aimed at reducing pollutant concentrations in target areas across the City.

Reference should be made to Figure 2 within Appendix A for a graphical representation of the monitoring locations.

4.3 Background Pollutant Concentrations

The total concentration of a pollutant is comprised of explicit local emission sources (such as roads and industrial sources) and the background component. The background component consists of indeterminate sources which are transported into an area from further away by meteorological conditions. Background pollutant concentrations are therefore the ambient level of pollution that is not affected by local sources of pollution.

In reality, it is not usually practical to obtain a true representation of background levels in urban areas due to corruption by local sources; background levels used in assessments may contain a mixture of both sources.

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 LAs in their Review and Assessment of air quality. The Proposed Development site is located across grid square:

- NGR: 383500, 396500

Data for this location was downloaded from the DEFRA website⁹. For the purpose of this assessment, background concentrations are summarised in Table 5 for the predicted development opening year (2021).

Table 5: Predicted Background Pollutant Concentrations

Pollutant	Predicted Background Concentration ($\mu\text{g}/\text{m}^3$)
	2021
NO_x	26.71
NO_2	18.77
PM_{10}	12.97
$\text{PM}_{2.5}$	8.32

As indicated in Table 5, background pollutant concentrations of NO_2 and PM are below the relevant AQOs detailed in Table 1.

⁹ <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

4.4 Sensitive Receptors

A sensitive receptor is defined as any location which may be affected by changes in air quality as a result of a development. These have been defined for operational phase impacts in this section.

A desk top study was undertaken to identify the closest receptor locations to the application site. This indicated residential locations within close proximity to all development boundaries. There are both educational or medical facilities in the immediate vicinity of the application site or the affected road networks, with the nearest education facility (Holy Name RC Primary School) and medical facility (The Wellington Medical Centre) located approximately 258m east and 30m west of the site, respectively.

5.0 ASSESSMENT

5.1 Construction Phase Assessment

5.1.1 Screening Assessment

The assessment was undertaken in accordance with the methodology detailed in Appendix B.

It is expected that fugitive dust releases associated with construction phase activities will be suitably controlled through best practice techniques. Additionally, the maize silos will be constructed off site resulting in minimal fugitive dust releases during construction. As such, the proposed works it is not likely to produce significant fugitive dust releases during construction, earthworks or trackout activities.

Assuming good practice dust control measures are implemented, the residual significance of potential air quality impacts from dust generated by construction phase activities is predicted to be **not significant**.

5.1.2 Mitigation

For the avoidance of doubt, it is recommended that the appointed sub-contractor undertaking the construction activities associated with the proposed development adheres to the best practice methods outlined in the IAQM document³.

Mitigation measures outlined in the IAQM guidance have been adapted for the Proposed Development site as summarised in Table 6. It should be noted demolition activities are not required to prepare for construction and have not been considered further in the assessment.

Table 6: Fugitive Dust Mitigation Measures

Issue	Control Measure
Communication	- Develop and implement a stakeholder communications plan that includes community engagement before work commences on site. - Display the name and contact details of person(s) accountable for air quality and dust issues on the site boundary. This may be the environment manager/engineer or the site manager. - Display the head or regional office contact information. - Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority.
Site Management	- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner, and record the measures taken. - Make the complaints log available to the local authority when asked. - Record any exceptional incidents that cause dust and/or air emissions, either on- or off- site, and the action taken to resolve the situation in the log book.

Issue	Control Measure
Monitoring	- Undertake daily on-site and off-site inspection, where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars, and window sills within 100 m of site boundary, with cleaning to be provided if necessary. - 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 site layout so that machinery and dust causing activities are located away from receptors, as far as is possible. - Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site. - Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive time period. - Avoid site runoff of water or mud. - Keep site fencing, barriers and scaffolding clean using wet methods - Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on site. If they are being re-used on-site cover as described below. - Cover, seed, or fence stockpiles to prevent wind whipping
Operating vehicle/machinery and sustainable travel	- Ensure all vehicles 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. - Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on un-surfaced haul roads 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). - Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials. - Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).
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. - 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.

Issue	Control Measure
Waste management	Avoid bonfires and burning of waste materials.
Earthworks	- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable. - Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable. - Only remove the cover in small areas during work and not all at once
Construction	- Avoid scabbling (roughening of concrete surfaces) if possible. - 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.

5.1.3 Residual Impacts

Assuming the relevant mitigation measures outlined in Table 6 are implemented, the residual effect from all dust generating activities is predicted to be negligible and therefore **not significant** in accordance with the IAQM guidance³.

5.2 Operational Phase Assessment

The assessment was undertaken in accordance with the methodology detailed in Section 3.2.

5.2.1 Road Vehicle Exhaust Emission Impacts

Any additional vehicle movements associated with the Proposed Development will generate exhaust emissions, such as NO₂, PM₁₀ and PM_{2.5} on the local and regional road networks.

Traffic data provided by Heineken UK indicates the Proposed Development is anticipated to generate a maximum of 4 two-way vehicle movements per week on the local road network with no increase in traffic movements internally within the site. As such, it is considered that the operational phase of the site will not result in a change of AADT flows of more than 100, produce over 25 HDV movements per day or significantly affect average speeds on the local road network.

Subsequently, potential air quality impacts associated with operational phase road vehicle exhaust emissions are predicted to be **not significant** in accordance the EPUK and IAQM⁵ screening criteria shown in Section 3.2.1.

5.2.2 Fugitive Dust Impacts

Heineken UK have confirmed that the transfer of maize from HGV to silo is controlled under negative pressure and all pipework will be fully sealed during imports. The control measures in place therefore minimise the release of fine dust emissions, such as PM₁₀ or PM_{2.5}, and associated impacts will be negligible under normal operation.

Should fugitive dust releases occur then this would indicate a fault with the process and immediate remedial measures will be taken to eliminate the problem and avoid significant releases of PM₁₀ and PM_{2.5}.

Whilst the transfer system is fully controlled, it is recommended that the operation of the maize silo takes account of basic best practice mitigation. The best practice techniques detailed below relate to recommendations provide within the IAQM guidance⁴ and should be reviewed prior to the commencement of works and implemented where viable:

- Provide training to the site personnel on dust mitigation. Training should also cover 'emergency preparedness plans' to react quickly in case of any failure of the system;
- HGV vehicles to avoid idling while unloading;
- HGV vehicles used to transport maize are to be cleaned before they leave the site;
- Routine clearance of any spillages to minimise accumulations of maize around the structures;
- Enclose transfer points as best as possible;
- Imports should ideally be planned during favourable weather conditions. Where possible, imports during extended periods of windy conditions should be avoided; and
- Maintain good communication to help alleviate concerns between the operators and the surrounding communities.

Following the implementation of the above it is expected that fugitive dust impacts associated with the operation of the maize silos will be **not-significant**.

5.2.3 Combustion Emission Impact

There is no scope within the development to provide any form of centralised combustion plant. As such, potential air quality impacts associated with operational phase combustion emissions are therefore predicted to be **not significant**.

6.0 CONCLUSION

Ensafe Group were commissioned by the Client to undertake an Air Quality Assessment in support of the installation of 2 new 60 ton maize silos at Heineken UK, Manchester.

During the construction phase of the Proposed Development there is the potential for air quality impacts as a result of fugitive dust emissions from the site. These were assessed in accordance with the IAQM methodology. Assuming good practice dust control measures are implemented, the residual potential air quality impacts from dust generated by construction, earthworks and trackout activities was predicted to be **not significant**.

A review of MCC monitoring data at representative locations indicated that monitored annual mean NO₂ and PM concentrations are below the relevant AQOs at roadside locations.

An assessment was undertaken using the EPUK and IAQM screening criteria to determine the potential for vehicle trips generated by the Proposed Development to affect local air quality. The traffic data provided by the client, indicated that Proposed Development is anticipated to generate a maximum of 4 two-way vehicle trips per week on the local road network. Anticipated development traffic flows are **below** the relevant EPUK and IAQM assessment thresholds and operational impacts could be screened out as **not significant**.

An assessment was undertaken using IAQM criteria to determine the potential for on-site activities during the operation phase to cause fugitive dust emissions and to affect local air quality. Due to the nature of the Proposed Development, and application of negative pressure within the system, operational fugitive dust impacts could be screened out as **not significant**.

Basic best practice mitigation techniques have however been recommended to further alleviate PM₁₀ and PM_{2.5} emissions during operations.

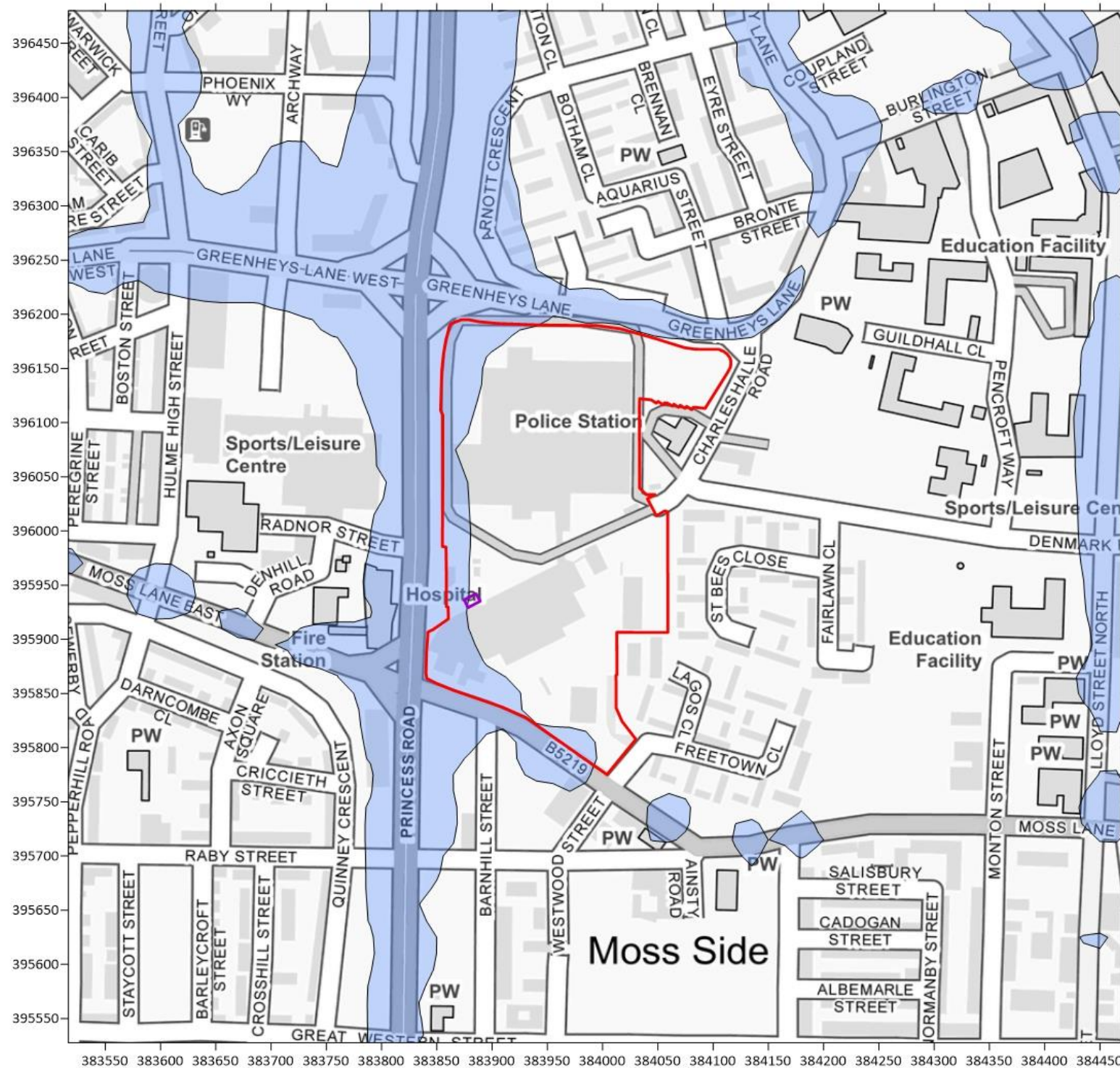
Based on the assessment results, air quality is not considered a constraint to planning consent and the Proposed Development is considered suitable for the proposed use.

7.0 ABBREVIATIONS

AADT	Annual Average Daily Traffic
ADM	Atmospheric Dispersion Modelling
AQLV	Air Quality Limit Value
AQMA	Air Quality Management Area
AQO	Air Quality Objectives
AQS	Air Quality Strategy
ASR	Air Quality Status Report
DEFRA	Department for Environment, Food and Rural Affairs
DMP	Dust Management Plan
EPUK	Environmental Protection UK
EU	European Union
HDV	Heavy Duty Vehicle
IAQM	Institute of Air Quality Management
LAQM	Local Air Quality Management
LA	Local Authority
LDV	Light Duty Vehicle
MCC	Manchester City Council
NGR	National Grid Reference
NO ₂	Nitrogen dioxide
NO _x	Oxides of nitrogen
NPPF	National Planning Policy Framework
NPPG	National Planning Practice Guidance
PM _{2.5}	Particulate matter with an aerodynamic diameter of less than 2.5µm
PM ₁₀	Particulate matter with an aerodynamic diameter of less than 10µm

END OF REPORT

APPENDIX A - FIGURES



Legend

- Site Boundary
- Air Quality Management Area
- Proposed Maize Silos

Title

Figure 1
Site Location

Project

Maize Silos
Heineken UK, Manchester

Project Number

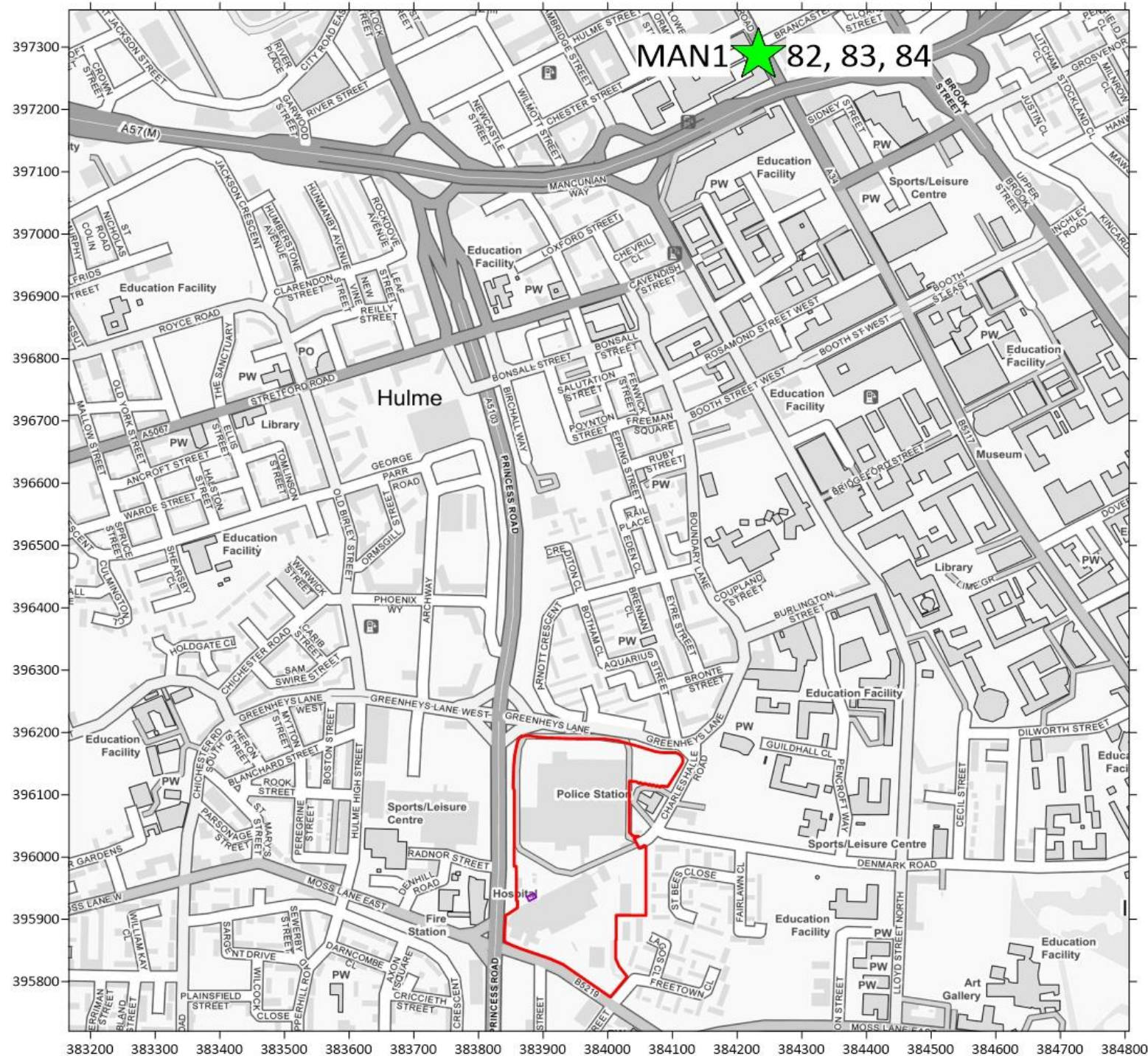
AQ4306

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Ensafe Consultants
Osprey House, Broadway, Manchester M50 2UE

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www.ensafe.co.uk



Legend

-  Site Boundary
-  Automatic and Diffusion Tube Monitoring Locations
-  Proposed Maize Silos

Title

Figure 2
Monitoring Locations

Project

Maize Silos
Heineken UK, Manchester

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APPENDIX B – CONSTRUCTION PHASE ASSESSMENT CRITERIA

CONSTRUCTION PHASE METHODOLOGY

There is the potential for fugitive dust emissions to occur as a result of construction phase activities. These have been assessed in accordance with the methodology outlined within the IAQM document³. Activities are divided into four types to reflect their different potential impacts. These are:

- Demolition
- Earthworks;
- Construction; and
- Trackout.

The potential for dust emissions was assessed for each activity that is likely to take place and considered three separate dust effects:

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to a significant increase in exposure to PM₁₀ and PM_{2.5}.

The assessment steps are detailed below.

Step 1

Step 1 screens the requirement for a more detailed assessment. Should human receptors be identified within 350m from the site boundary or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should proceed to Step 2. Additionally, should ecological receptors be identified within 50m of the boundary site or 50m from the construction vehicle route up to 500m from the site entrance, then the assessment should also proceed to Step 2.

Should sensitive receptors not be present within the relevant distances then negligible impacts would be expected and further assessment is not necessary.

Step 2

Step 2 assesses the risk of potential dust impacts. A site is allocated to a risk category based on two factors:

- The scale and nature of the works, which determines the magnitude of dust arising as: small, medium, or large (Step 2A); and
- The sensitivity of the area to dust impacts, which can be defined as low, medium, or high sensitivity (Step 2B).

The two factors are combined in Step 2C to determine the risk of dust impacts without mitigation applied. Step 2A defines the potential magnitude of dust emission through the construction phase. The relevant criteria are summarised in Table B1.

Table B1: Construction Dust - Magnitude of Emission

Magnitude	Activity	Criteria
Large	Demolition	• Total building volume greater than 50,000m³ • Potentially dusty construction material (e.g., concrete) • On-site crushing and screening • Demolition activities greater than 20m above ground level
	Earthworks	• Total site area greater than 10,000m² • 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

Magnitude	Activity	Criteria
Medium	Construction	- Total building volume greater than 100,000m³ - 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
	Demolition	- Total building volume 20,000m³ to 50,000m³ - Potentially dusty construction material - Demolition activities 10m to 20m above ground level
	Earthworks	- Total site area 2,500m² to 10,000m² - Moderately dusty soil type (e.g., silt) 5 to 10 heavy earth moving vehicles active at any one time - Formation of bunds 4m to 8m in height - Total material moved 20,000 tonnes to 100,000 tonnes
Small	Construction	- Total building volume 25,000m³ to 100,000m³ - Potentially dusty construction material (e.g., concrete) - On site concrete batching
	Trackout	10 to 50 HDV trips per day - Moderately dusty surface material (e.g., high clay content) - Unpaved road length 50m to 100m
	Demolition	- Total building volume under 20,000m³ - Construction material with low potential for dust release (e.g., metal cladding or timber) - Demolition activities less than 10m above ground level - Demolition during wetter months
	Earthworks	- Total site area less than 2,500m² - 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 4m in height - Total material moved less than 20,000 tonnes - Earthworks during wetter months
	Construction	- Total building volume less than 25,000m³ - Construction material with low potential for dust release (e.g., metal cladding or timber)
	Trackout	<10 HDV (3.5t) outward movements in any one day - Surface material with low potential for dust release - Unpaved road length <50m

Step 2B defines the sensitivity of the area around the development site for construction, earthworks and trackout. The factors influencing the sensitivity of the area are shown in Table B2.

Table B2: Examples of Factors Defining Sensitivity of an Area

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
High	- Users expect of high levels of amenity - High aesthetic or value property - People expected to be present continuously for extended periods of time	Internationally or nationally designated site e.g., Special Area of Conservation

Sensitivity	Examples	
	Human Receptors	Ecological Receptors
	Locations where members of the public are exposed over a time period relevant to the AQO for PM₁₀ e.g., residential properties, hospitals, schools, and residential care homes	
Medium	- Users would expect to enjoy a reasonable level of amenity - Aesthetics or value of their property could be diminished by soiling - People or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land e.g., parks and places of work	Nationally designated site e.g., Sites of Special Scientific Interest
Low	- Enjoyment of amenity would not reasonably be expected - Property would not be expected to be diminished in appearance - Transient exposure, where people would only be expected to be present for limited periods. e.g., public footpaths, playing fields, shopping streets, playing fields, farmland, footpaths, short term car park and roads	Locally designated site e.g., Local Nature Reserve

The guidance also provides the following factors to consider when determining the sensitivity of an area to potential dust impacts during the construction phase:

- Any history of dust generating activities in the area;
- The likelihood of concurrent dust generating activity on nearby sites;
- Any pre-existing screening between the source and the receptors;
- Any conclusions drawn from analysing local meteorological data which accurately represent the area; and if relevant the season during which works will take place;
- Any conclusions drawn from local topography;
- Duration of the potential impact, as a receptor may become more sensitive over time; and
- Any known specific receptor sensitivities which go beyond the classifications given in the document.

These factors were considered in the undertaking of this assessment.

The sensitivity of the area to dust soiling effects on people and property is shown in Table B3.

Table B3: Sensitivity of the Area to Dust Soiling Effects on People and Property

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)			
		Less than 20	Less than 50	Less than 100	Less than 350
High	More than 100	High	High	Medium	Low
	10 - 100	High	Medium	Low	Low
	1 - 10	Medium	Low	Low	Low
Medium	More than 1	Medium	Low	Low	Low
Low	More than 1	Low	Low	Low	Low

Table B4 outlines the sensitivity of the area to human health impacts.

Table B4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM ₁₀ Concentration	Number of Receptors	Distance from the Source (m)				
			Less than 20	Less than 50	Less than 100	Less than 200	Less than 350
High	Greater than 32µg/m ³	More than 100	High	High	High	Medium	Low
		10 - 100	High	High	Medium	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	28 - 32µg/m ³	More than 100	High	High	Medium	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	High	Medium	Low	Low	Low
	24 - 28µg/m ³	More than 100	High	Medium	Low	Low	Low
		10 - 100	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
	Less than 24µg/m ³	More than 100	Medium	Low	Low	Low	Low
		10 - 100	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Medium	Greater than 32µg/m ³	More than 10	High	Medium	Low	Low	Low
		1 - 10	Medium	Low	Low	Low	Low
	28 - 32µg/m ³	More than 10	Medium	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	24 - 28µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
	Less than 24µg/m ³	More than 10	Low	Low	Low	Low	Low
		1 - 10	Low	Low	Low	Low	Low
Low	-	More than 1	Low	Low	Low	Low	Low

Table B5 outlines the sensitivity of the area to ecological impacts.

Table B5: Sensitivity of the Area to Ecological Impacts

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

Step 2C combines the dust emission magnitude with the sensitivity of the area to determine the risk of unmitigated impacts.

Table B6 outlines the risk category from demolition activities.

Table B6: Dust Risk Category from Demolition

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Medium
Medium	High	Medium	Low
Low	Medium	Low	Negligible

Table B7 outlines the risk category from earthworks and construction activities.

Table B7: Dust Risk Category from Earthworks and Construction

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Medium	Low
Low	Low	Low	Negligible

Table B8 outlines the risk category from trackout.

Table B8: Dust Risk Category from Trackout

Receptor Sensitivity	Dust Emission Magnitude		
	Large	Medium	Small
High	High	Medium	Low
Medium	Medium	Low	Negligible
Low	Low	Low	Negligible

Step 3

Step 3 requires the identification of site-specific mitigation measures within the IAQM guidance to reduce potential dust impacts based upon the relevant risk categories identified in Step 2. For sites with negligible risk mitigation measures beyond those required by legislation are not required. However, additional controls may be applied as part of good practice.

Step 4

Once the risk of dust impacts has been determined and the appropriate mitigation measures identified, the final step is to determine the significance of any residual impacts. For almost all construction activity, the aim should be to control effects through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

APPENDIX C – ASSESSORS CURRICULUM VITAE

JOSHUA DAVIES

Principal Air Quality Consultant

BSc (Hons) AMIEnvSci

KEY EXPERIENCE

Josh is an Environmental Consultant with specialist experience in the air quality sector. His key capabilities include:

- Production of Air Quality Assessments to the Department for Environment, Food and Rural Affairs (DEFRA), Environment Agency and Environmental Protection UK (EPUK) methodologies for clients from the residential, retail, and commercial sectors.
- Detailed dispersion modelling of road vehicle emissions using ADMS-Roads. Studies have included impact assessment of pollutant concentrations at various floor levels and assessment of suitability of development sites for proposed end-use.
- Assessment of dust impacts from construction sites to the Institute of Air Quality Management (IAQM) methodology.
- Assessment of Odour Impact from commercial and industrial processes in line with Environment Agency (EA) and IAQM methodologies and guidance
- Quantification of Ecological Impacts associated with Nitrogen and Acid Deposition from industrial processes
- Production of air quality mitigation strategies for developments throughout the UK.
- Management of Environmental Permit Applications primarily for the Medium Combustion Plant Directive (MCPD)

SELECT PROJECTS SUMMARY

- Imperial War Museum, Duxford – Air Quality screening assessment associated with dust and odour as a result of proposed restoration activities
- London South Bank University -AQA for redevelopment of the campus, with associated energy centre
- Scunthorpe United Football Stadium - AQA for new sports stadium and commercial and retail park
- Heineken UK, Manchester – Production of various AQAs for the expansion of the Manchester Brewery site.
- Cricklewood Freight Terminal – AQA for an aggregate freight terminal in Brent. Dust and HGV impact assessment and mitigation strategy
- Llay Wrexham – AQ associated with a Short-Term Reserve Operation site in line with the Medium Combustion Plant Directive (MCPD)

ES Chapters

- Great Jackson Street Framework - Production of a number of ES chapters for large-scale mixed use multi storey buildings
- Keele University – Road and Energy Assessment for the proposed re-development of the student campus
- Newton Farm, Perth - EIA for a medium scale residential development in close vicinity to the A9.

Odour Assessments

- Clipstone House Farm – Quantitative odour and ammonia assessment in support of a proposed extension to a large-scale poultry farm.
- Chatteris AD Plant - Quantitative odour modelling and sniff tests to discharge condition on an existing anaerobic digestion plant
- Jennychem, Snodland - Risk Assessment and Best Practice Statement in support of the proposed car repairs facility spray booth

London Borough of Southwark Experience

- Camberwell Road, Southwark - Exposure assessment for a proposed gym within an AQMA, 24 hour and 1 hour mean AQOs assessed.
- Pelier Street- AQA for a residential development located within the Southwark AQMA
- Haddonfield Estate - AQA for a residential development located within the Southwark AQMA
- Lavington Street - AQA for mixed use scheme in AQMA in Southwark, including an AQN assessment.
- Daniels Road - AQA for a residential development within the Southwark AQMA

Educational Developments

- Brinsworth Comprehensive School, Rotherham - Baseline and Construction phase assessment for the proposed extension and new Sports Hall. Site suitability due to the Schools close proximity to the M1 Motorway.
- Ashton House, Waterloo Street, Bolton – Exposure and impact assessment related to a proposed expansion of the existing site located within the Greater Manchester AQMA
- St Marys and Johns CE School, Barnet AQA for the refurbishment of the existing school and the construction of a 3-storey classroom block, within the borough wide Barnet AQMA.
- St Peters Catholic School, Guildford - AQA for the redevelopment of the existing site, and the construction of a two-storey classroom block.

Monitoring & Surveying Experience

- Co-ordination and management of NO2 diffusion tube monitoring surveys in accordance with DEFRA guidance.
- Odour Acuity certified, undertaken numerous site sniff tests

QUALIFICATIONS

- Bachelor of Science
- Member of the Institute of Environmental Science (IES)
- Odour Acuity Certified