MILLER GOODALL
ACOUSTICS AND AIR QUALITY

AIR QUALITY ASSESSMENT

on behalf of

RAPLEYS LLP

for

THORLEY LANE, ALTRINCHAM

REPORT DATE: 9 MARCH 2021

REPORT NUMBER: 102505

Miller Goodall Ltd
Ground Floor
Ashworth House
Deakins Business Park
Blackburn Road
Egerton
Bolton
Lancashire
BL7 9RP

[redacted]

www.millergoodall.co.uk

Company registration number 5201673

Summary

This air quality report is submitted in relation to an outline planning application for a proposed residential development at Thorley Lane, Altrincham.

This report provides a review of existing air quality in the vicinity of the proposed development. It also provides a simple assessment of the impact of the proposed development on local air quality during both its construction and operational phases.

With the implementation of appropriate mitigation measures, the dust impacts associated with construction and demolition activities are considered to have no residual effects when considered in accordance with IAQM guidance.

Existing air quality around the proposed development site has been reviewed. Concentrations of NO_2 and PM_{10} are likely to be below their respective long and short-term objectives at the proposed development site. Therefore, the site is considered suitable with regards to air quality.

The proposed development could impact on local air quality by virtue of road traffic emissions associated with the development and during the construction phase. The impact of the proposed development on local air quality is considered to be insignificant.

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

Prepared By	Lesley Goodall	Reviewed By	Melody Horan
Signed	[redacted]	Signed	[redacted]
Date	9 March 2021	Date	9 March 2021

Record of changes

Version	Date	Change	Initials
1	9 March 2021	Report issued to client	LG

Contents

1 Introduction

1.1 This air quality report is submitted in support of an outline planning application for a proposed residential development at Thorley Lane, Altrincham. The site lies within the administrative boundary of Trafford Metropolitan Borough Council (TMBC).

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

1.3 Air pollution in urban areas is generally dominated by emissions from road vehicles. The quantity and composition of vehicle emissions is dependent on the type of fuel used, engine type, size and efficiency, vehicle speeds and the type of exhaust emissions abatement equipment employed.

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

2 Site Description

2.1 The site is located approximately 750 m to the south of Timperley.

2.2 There are residential properties to the north of the site. The A5144 Thorley Lane runs along the eastern site boundary, beyond which there are three landscaping companies. The southern boundary terminates at Timperley Brook, which borders private pastureland, Residential dwellings are located to the west of the proposed development site. The site location is shown in **Appendix A**.

3 Proposed Development

3.1 The outline application comprises of the demolition of existing buildings and the erection of up to 116 dwellings. Thorley Lane provides the main access point into the site with secondary access to the site granted via Wood Lane.

3.2 The transport consultant for the proposed development, Curtins, states that the proposed development is expected to introduce changes in AADT flows of approximately 440 LDV and 0 HDV. The 440 LDV will leave and enter the site via two access points. These are below the indicative IAQM/EPUK criteria[2] which indicate when a detailed assessment is required.

[1] Department for the Environment Food and Rural Affairs (2018) '*Local Air Quality Management Technical Guidance Document LAQM.TG (16)*', London: Defra.

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

4 Policy Context

4.1 Standards and Objectives

4.1.1 The standards and objectives relevant to the LAQM framework have been prescribed through the Air Quality (England) Regulations (2000) and the Air Quality (England) (Amendment) Regulations 2002; the Air Quality Standards Regulations 2010 set out the combined Daughter Directive limit values and interim targets for Member State compliance. The UK left the EU on 31st January 2020 and is no longer a member state. However, the current framework of air quality legislation was converted into domestic law through the European Union (Withdrawal) Act 2018[3].

4.1.2 The current air quality standards and objectives (for the purpose of LAQM) are presented in **Table 1**. Pollutant standards relate to ambient pollutant concentrations in air, set on the basis of medical and scientific evidence of how each pollutant affects human health. Pollutant objectives, however, incorporate target dates and averaging periods which take into account economic considerations, practicability and technical feasibility.

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

Pollutant	Air Quality Objective		To be Achieved by
	Concentration	Measured As*	
Nitrogen dioxide (NO_2)	200 µg/m^3	1-hour mean not to be exceeded more than 18 times per year	31/12/2005
	40 µg/m^3	Annual mean	31/12/2005
Particles (PM_{10})	50 µg/m^3	24-hour mean not to be exceeded more than 35 per year	31/12/2004
	40 µg/m^3	Annual mean	31/12/2004
Particles ($PM_{2.5}$)	25 µg/m^3	Annual mean (target)	2020
	15% cut in annual mean (urban background exposure)		2010-2020

Note:*how the objectives are to be measured is set out in the UK Air Quality (England) Regulations (2000).

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

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

4.1.5 All long and short-term objectives apply to the proposed development[1].

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

4.2 Greater Manchester Action Plan 2016-2021

4.2.1 The Greater Manchester Combined Authority (GMCA) Air Quality Action Plan 2016-2021[4] provides information in respect of the actions planned by the Greater Manchester Authorities in relation to declared AQMAs. Action Plans are the mechanism by which the local authorities, in collaboration with national agencies and others, outline their plans for working towards achieving the air quality objectives through the powers available to them. In relation to managing new development, the action plan states that:

*"**Action 1.1***

Greater Manchester (GM)councils to adopt the most recent IAQM Guidance on the Assessment of Dust from Demolition and Construction as current best practice to assess and mitigate emissions from construction sites. i. Where a key priority area is affected by a proposed scheme, a high level of mitigation control will be requested.

Action 1.2

GM local authorities will adopt the most recent IAQM/EPUK guidance for air quality assessment as current best practice, to help ensure that planning applications consider potential local air quality impacts and opportunities to improve air quality are realised. i. Where a Key Priority Area is significantly adversely affected by a proposed scheme, a high level of mitigation control will be requested. ii. The IAQM/EPUK guidance will also be used to screen and assess industrial sources, such as boilers or large stationary engines. GM local authorities to recommend mitigation controls in accordance with the most recent guidance and the other actions in this document for new developments that contribute to a deterioration of air quality in Air Quality Management Areas (AQMAs). Where an air quality assessment is triggered, it should include a review of monitoring data. Where monitoring is not currently undertaken, it may be requested to inform the application or to confirm the effects."

5 Methodology

5.1 Data Sources

5.1.1 The air quality assessment of the proposed development was undertaken with reference to information from a number of sources, as detailed in **Table 2**.

Table 2: Key Information Sources

Data Source	Reference
Greater Manchester Combined Authority (GMCA)	GMCA (2020) 2019 Air Quality Annual Status Report (ASR) GMCA (2016) Greater Manchester Air Quality Action Plan 2016-2021
Department for Environment Food and Rural Affairs (Defra)	Defra (2018) *Local Air Quality Management Technical Guidance TG(16)*

[4] GMCA (2016) Greater Manchester Air Quality Action Plan 2016-2021

Data Source	Reference
Defra's LAQM Support Tools	Local Air Quality Management 1 km x 1 km grid background pollutant maps
Environmental Protection UK (EPUK) and Institute of Air Quality Management (IAQM)	EPUK and IAQM (January 2017) *Land Use Planning and Development Control: Planning for Air Quality (v1.2)*
Institute of Air Quality Management (IAQM)	IAQM (2014) *Assessment of Dust from Demolition and Construction*

5.2 Construction Dust Assessment

5.2.1 The IAQM provide guidance[5] on the assessment of air quality impacts arising from construction and demolition activities and has been used in this assessment. This section follows a risk assessment to determine the likely impact of the development on nearby receptor location during the construction phase and goes on to recommend mitigation measures which should be implemented to reduce any impact. The methodology for the assessment is shown in **Appendix B.** The study area in relation to construction dust and the buffer zones of <20 m, 20 m – 50 m and 50 – 100 m from site are shown in **Appendix C**.

5.3 Air Quality Assessment

5.3.1 A simple assessment of air quality in terms of the impact of the proposed development on concentrations of NO_2 and PM_{10}, which relies on already published information and without quantification of impacts, has been completed using sources such as the Local Authority's monitoring network and the Defra LAQM support tools.

6 Baseline Air Quality

6.1 Introduction

6.1.1 Baseline air quality at the proposed development has been established by examining monitoring data produced by TMBC and background concentration maps provided by Defra for the grid squares covering the proposed development.

6.1.2 The site is not located in close proximity to any AQMAs. The nearest AQMA is over 400 m to the north of the site at the junction of Thorley Lane and the A560. The location of the AQMA in relation to the proposed development site is shown in **Appendix A**.

[5] IAQM "Assessment of dust from demolition and construction" 2014

6.2 Local Authority Air Quality Monitoring

Nitrogen Dioxide (NO_2)

6.2.1 TMBC undertook automatic monitoring at 17 stations within its authority in 2019. The closest automatic monitoring station is approximately 5.5 km east of the proposed development site. Therefore, none of these monitors are considered representative of the proposed development site.

6.2.2 TMBC undertook diffusion tube monitoring of NO_2 across its district in 2019. There are two diffusion tubes approximately 1 km north of the proposed development site. The results from these monitoring sites are shown in **Table 3**; the locations of the tubes are shown in **Appendix A**.

Table 3: Annual Mean NO_2 Concentrations Monitored by the LA within the Study Area

Site ID and Type	Location		Annual Mean NO_2 Concentrations ($\mu g/m^3$)		
			2017	2018	2019
TR10 (urban traffic)	378822	389010	18.1	17.3	18.0
TR17 (urban traffic)	379073	389099	25.4	23.8	-
Annual Mean NO_2 air quality objective				40 $\mu g/m^3$	

6.2.3 The monitoring results in **Table 3** indicate that annual mean concentrations of NO_2 have been below the NO_2 annual mean objective at the monitoring sites since 2017.

6.2.4 The results indicate that the short-term objective for NO_2 is unlikely to be exceeded at the monitoring site as annual mean concentrations are less than 60 μgm^3 [1].

Particulate Matter (PM_{10})

6.2.5 TMBC does undertake PM_{10} monitoring. However, as discussed above, the automatic monitoring stations are not considered representative of the proposed development site.

6.3 DEFRA Background Concentrations

6.3.1 There are no background monitoring locations in the vicinity of the proposed development site and neighbouring residential areas. Background concentrations of NO_2 and PM_{10} were therefore obtained from the background concentration maps provided by Defra for the grid squares covering the proposed development[6]. These are shown in **Table 4** below.

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

Table 4: Background Pollutant Concentrations Obtained for the 1km x 1km Grid Squares Covering the Site*

Grid Square	Pollutant	2019 (µg/m^3)	2021 (µg/m^3)
378500, 387500	NO_2	14.29	13.15
	PM_{10}	10.80	10.47

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

7 Construction Dust Impact Assessment

7.1 Step 1 – The Need for a Detailed Assessment

7.1.1 The site boundary is within 350 m of human receptors. In addition, there are human receptors within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance. Therefore, a detailed assessment of the construction phase of the development was undertaken. The detailed assessment has not addressed ecological receptors.

7.2 Step 2 – Assess the Risk of Dust Impacts

Step 2A Dust Emission Magnitude

7.2.1 The potential dust emission magnitude in relation to the development has been determined using the criteria detailed in **Table 1** in **Appendix B**:

- Demolition: The total building volume to be demolished is <20,000 m^3. The dust emission magnitude for demolition is, therefore, considered to be **small**.
- Earthworks: The total site area is >10,000 m^2. The dust emission magnitude for earthworks is, therefore, considered to be **large**.
- Construction: The total building volume to be constructed is 25,000 m^3 – 100,000 m^3. The dust emission magnitude for construction is, therefore, considered to be **medium**.
- Trackout: It has been conservatively assumed there are likely to be 10-50 HDV outward movements in any one day. The dust emission magnitude for trackout is, therefore, considered to be **medium**.

7.2.2 The scale and nature of works onsite were considered to determine the potential dust emission magnitude for demolition, earthworks and trackout activities as outlined in **Table 5**.

Table 5: Dust Emission Magnitudes for Each Activity

Activity	Dust Emission Magnitudes	Justification
Demolition	Small	• total building volume to be demolished is <20,000 m^3
Earthworks	Large	• the site area is >10,000 m^2
Construction	Medium	• total building volume to be constructed is 25,000 m^3 – 100,000 m^3
Trackout	Medium	• there are likely to be 10 - 50 HDV outward movements in any one day

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

7.2.3 Human receptors are located in residential houses within 20 m from construction, demolition and earthworks as well as road edges used by traffic associated with the site construction. In accordance with the criteria in **Table 2** in **Appendix B** and the IAQM guidance, the sensitivity of human receptors to the effects of dust soiling and health effects from construction, demolition, earthwork activities, and from trackout is therefore likely to be **high**.

Step 2B Sensitivity of the Area to Dust Soiling

7.2.4 The sensitivity of the area to dust soiling effects has been determined using the criteria detailed in **Table 3** in **Appendix B:**

- Demolition - sensitivity is considered to be **high** as construction activities take place within 20 m of 10 - 100 high sensitivity receptors;
- Earthworks - sensitivity is considered to be **high** as earthworks activities take place within 20 m of 10 - 100 high sensitivity receptors;
- Construction - sensitivity is considered to be **high** as construction activities take place within 20 m of 10 - 100 high sensitivity receptors; and
- Trackout activities – sensitivity is considered to be **high** as there are 10 - 100 high sensitivity receptors within 20 m of roads which relevant vehicles are likely to use that are up to 50 m from the site.

Step 2B Sensitivity of People to the Health Effects of PM_{10}

7.2.5 The background PM_{10} concentrations for 2019 and 2021 are shown in **Table 4**. Therefore, local levels of PM_{10} are likely to be <24 µg/m^3, during the construction phase.

7.2.6 Using this information and **Table 4** in **Appendix B**, the sensitivity of human receptors to health impacts from dust and PM_{10} for each activity were defined as:

- Demolition - sensitivity is considered to be **low** as demolition activities take place within 20 m of 10 - 100 high sensitivity receptors and the background PM_{10} concentration is predicted to be <24 µg/m^3;
- Earthworks - sensitivity is considered to be **low** as earthworks activities take place within 20 m of 10 - 100 high sensitivity receptors and the background PM_{10} concentration is predicted to be <24 µg/m^3;
- Construction - sensitivity is considered to be **low** as construction activities take place within 20 m of 10 - 100 high sensitivity receptors and the background PM_{10} concentration is predicted to be <24 µg/m^3; and

- Trackout activities – sensitivity is considered to be **low** as there are 10 - 100 high sensitivity receptors within 20 m of roads which relevant vehicles are likely to use that are up to 50 m from the site, and the background PM_{10} concentration is predicted to be <24 µg/m^3.

7.2.7 The sensitivity of the area to dust soiling and human health in each activity is summarised in **Table 6**.

Table 6: Outcome of Defining the Sensitivity of the Area

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

Step 2C Risk of Impacts

7.2.8 The dust emission magnitude and sensitivity of the area were combined and the risk of impacts determined using the criteria detailed in **Table 5** to **Table 8** in **Appendix B.**

- Demolition – is considered to be **medium** risk for dust soiling and **negligible** risk for human health;
- Earthworks – is considered to be **high** risk for dust soiling and **low** risk for human health;
- Construction – is considered to be **medium** risk for dust soiling and **low** risk for human health; and
- Trackout activities – is considered to be **medium** risk for dust soiling and **low** risk for human health;

7.2.9 A summary of the risks, before mitigation measures are applied, for dust soiling and human health are shown in **Table 7**.

Table 7: Risk of Dust Impacts

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

7.3 Step 3 – Site-Specific Mitigation

7.3.1 Step 3 of the IAQM guidance identifies appropriate site-specific mitigation. These measures are related to the site risk for each activity. Good practice mitigation measures highly recommended for the proposed development taken from the IAQM guidance are detailed below.

7.3.2 The general mitigation measures (for site management, preparing and maintaining the site, operating vehicle/machinery, operations and waste management), are appropriate for a site with a 'high risk' classification

(in this instance the site is classified as "high" risk due to earthworks)[7]. Mitigation measures specific to demolition, earthworks, construction and trackout are proposed based on the risk classifications in **Table 7**.

7.3.3 Recommended mitigation measures are shown in **Appendix D.**

7.4 Step 4 – Determine Significant Effects

7.4.1 The characteristics of the site and the surrounding area suggest that mitigation would not be impracticable or ineffective. With the implementation of the above mitigation measures, therefore, the residual impacts from the construction are considered to be not significant, in accordance with IAQM guidance.

8 Effect of Air Quality on the Development

8.1 As the proposed development is residential, both the long and short-term objectives apply[1].

8.2 The background concentrations in **Table 4** show that background concentrations of NO_2 and PM_{10} are well below health-based air quality objectives of 40 µg/m^3 for both pollutants. However, it is likely that the site is experiencing higher concentrations due to its proximity to road.

8.3 Due to their location, neither of the diffusions tubes within the study area are representative of conditions at the development site.

8.4 Transport for Greater Manchester (TfGM) conducted air pollution dispersion modelling for the Combined Authority members which was used to determine the location and extent of the AQMA. The AQMA was declared where the model predicted annual average NO_2 concentrations to be above 35 µg/m^3 [4]. The model output shows the predicted 2016 annual mean NO_2 concentrations across the proposed development site at a height of 0 m. This output is illustrated in **Appendix E** and shows that annual mean NO_2 concentrations across the site are below the long and short term NO_2 objectives.

9 Impact of the Development on Existing Air Quality

9.1 As discussed above, the development is located outside an AQMA and is expected to introduce changes in AADT flows of approximately 440 LDV and 0 HDV. As these changes are less than 500 LDV and 100 HDV AADT, IAQM and EPUK guidance[8] indicates that the impact of road traffic associated with the proposed development is likely to have an insignificant impact on local air quality.

9.2 The transport consultant, Curtins, has stated that it is "*reasonable to assume that the AADT would be less than 100 vehicles*" at the closest section of AQMA[9].

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

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

[9] Email from Miller Goodall Ltd to Aaron Tilley of Curtis 8th March 2021. Email from Aaron Tilley of Curtis to Miller Goodall Ltd 9th March 2021

10 Summary of Impacts and Conclusion

10.1 The assessment considered whether the proposed development could significantly change air quality during the construction phase. With the implementation of mitigation measures the dust impacts from the construction are considered to have no residual effects, in accordance with IAQM guidance.

10.2 Existing air quality around the development has been reviewed. Concentrations of NO_2 and PM_{10} are likely to be below their respective short-term objectives at the proposed development site. Therefore, the site is considered suitable with regards to air quality.

10.3 The traffic associated with this development is not expected to have a significant impact on local air quality when considered in accordance with IAQM Guidance[8].

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

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APPENDICES

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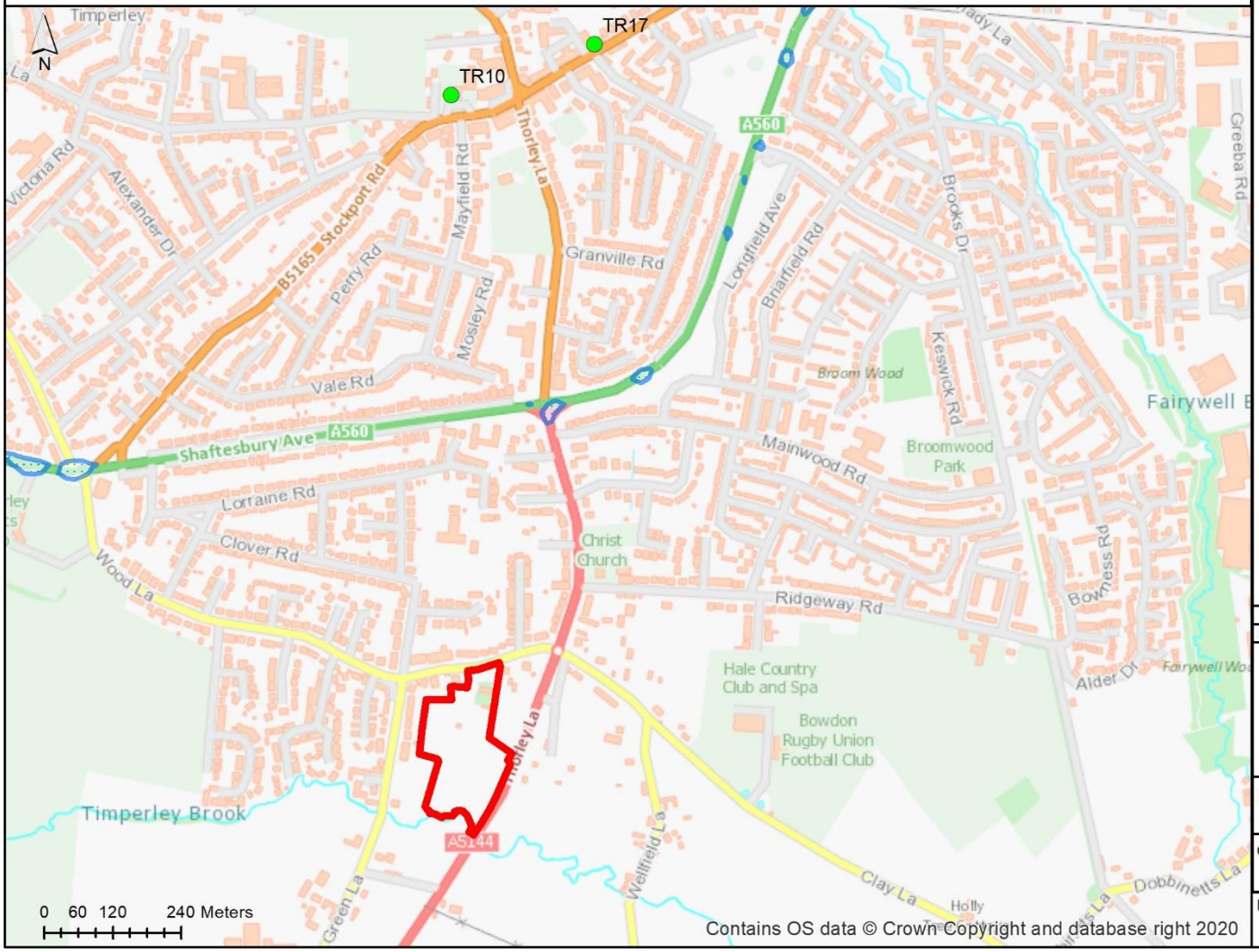
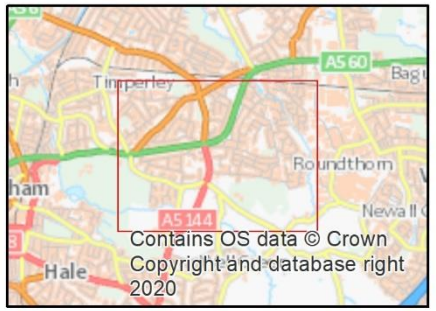
Appendix A: Site location, local authority monitoring and AQMA



Legend

- Site
- AQMA
- LA monitoring



Rev.	Date	Purpose of revision	Drawn By	Approved By
1	08/03/2021	Initial Issue	MH	LG

MILLER GOODALL
ACOUSTICS AND AIR QUALITY

Project:	Thorley Lane, Altrincham
Client:	Rapleys LLP
Report Number: 102505	Scale @ A4: 1:11,931

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Appendix B: Dust Risk Assessment Methodology

The following section outlines criteria developed by the IAQM for the assessment of air quality impacts arising from construction and demolition activities[5]. The assessment procedure is divided into four steps and is summarised below:

Step 1: Screen the Need for a Detailed Assessment

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

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

Step 2: Assess the Risk of Dust Impacts

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

Step 2A: Define the Potential Dust Emission Magnitude

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

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

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

Step 2B: Define the Sensitivity of the Area

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

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

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

Table 2: Criteria for Determining Sensitivity of Receptors

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

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

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

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

*distances considered are to the dust source

Table 4: Sensitivity of the Area to Human Health Impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from the Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m³	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m³	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m³	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m³	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m³	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m³	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m³	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

The sensitivity of the area is then summarised.

Step 2C Define the Risks of Impacts

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

Table 5: Risk of Dust Impacts - Demolition

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

Table 6: Risk of Dust Impacts- Earthworks

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

Table 7: Risk of Dust Impacts- Construction

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

Table 8: Risk of Dust Impacts- Trackout

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

Step 3 Determine Site Specific Mitigation

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

Step 4 Determine Significance of Residual Effects

At step four the significance of residual effects is assessed. For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Experience shows that this is normally possible. Hence the residual effect will normally be 'not significant'.

There may be cases where, for example, there is inadequate access to water for dust suppression to be effective, and even with other mitigation measures in place there may be a significant effect. Therefore, it is important to consider the specific characteristics of the site and the surrounding area to ensure that a conclusion of no significant effect is robust.

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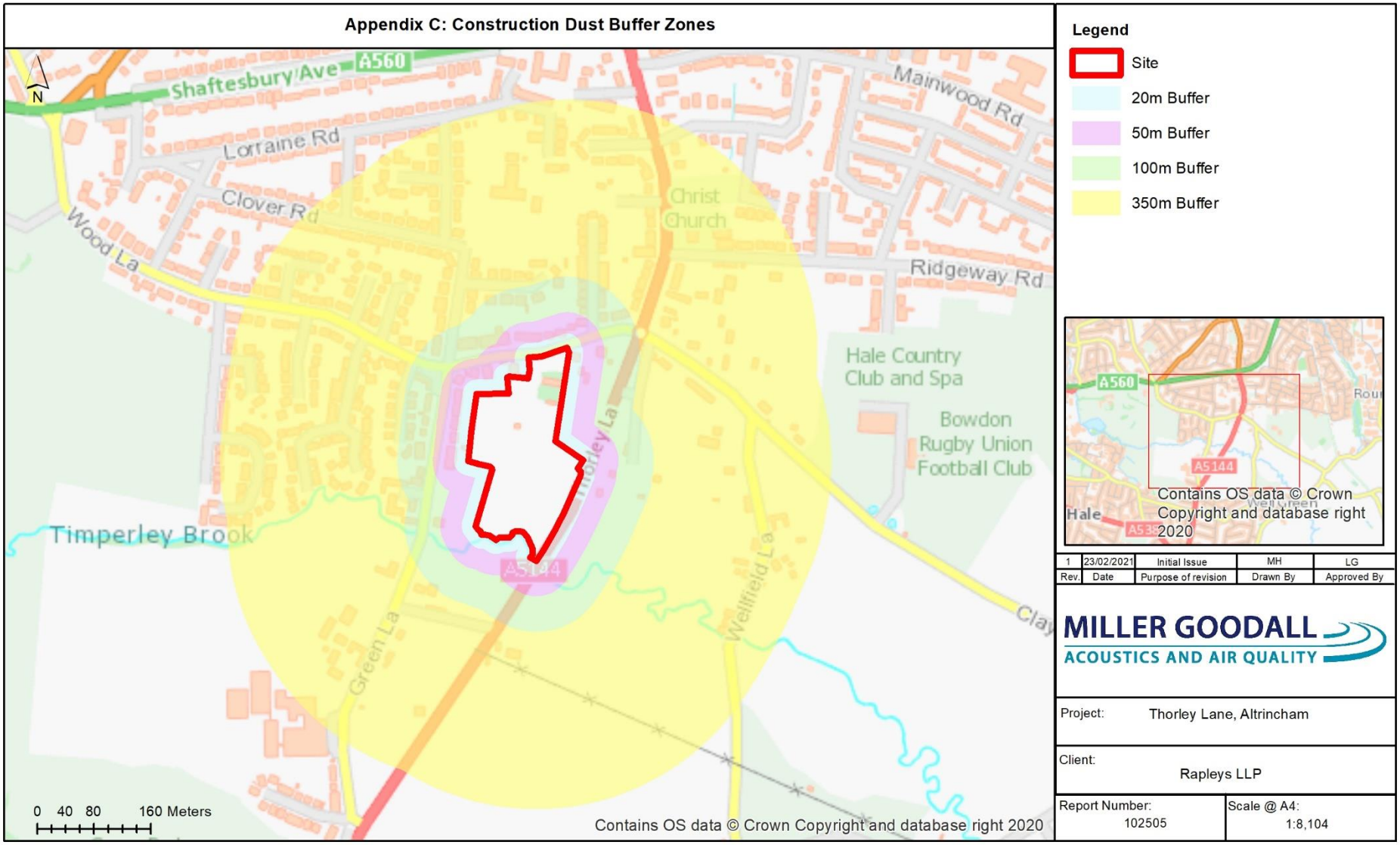
Appendix C: Construction Dust Buffer Zones



Rev.	Date	Purpose of revision	Drawn By	Approved By
1	23/02/2021	Initial Issue	MH	LG

MILLER GOODALL
ACOUSTICS AND AIR QUALITY

Project:	Thorley Lane, Altrincham
Client:	Rapleys LLP
Report Number: 102505	Scale @ A4: 1:8,104

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Appendix D: Dust Assessment Mitigation

xx Highly Recommended **x Desirable**

Measures relevant for demolition, earthworks, construction and trackout.

Mitigation Measure	High Risk
Communications	
Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	xx
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.	xx
Display the head or regional office contact information.	xx
Develop and implement a Dust Management Plan (DMP).	xx
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.	xx
Make the complaints log available to the local authority when asked.	xx
Record any exceptional incidents that cause dust and/or air emissions, either on- or offsite, and the action taken to resolve the situation in the log book.	xx
Hold regular liaison meetings with other high risk construction sites within 500 m of the site boundary, to ensure plans are co-ordinated and dust and particulate matter emissions are minimised. It is important to understand the interactions of the off-site transport/ deliveries which might be using the same strategic road network routes	xx
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.	xx
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.	xx
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.	xx
If requested by the Local Authority: Agree dust deposition, dust flux, or real-time PM_{10} continuous monitoring locations with the Local Authority; where possible commence baseline monitoring at least three months before work commences on site or, if it a large site, before work on a phase commences. Further guidance is provided by IAQM on monitoring during demolition, earthworks and construction.	xx
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.	xx

Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	xx
Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period.	xx
Avoid site runoff of water or mud.	xx
Keep site fencing, barriers and scaffolding clean using wet methods.	xx
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.	xx
Cover, seed or fence stockpiles to prevent wind whipping.	xx
Operating vehicle/machinery and sustainable travel	
Ensure all vehicles switch off engines when stationary - no idling vehicles.	xx
Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable.	xx
Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced 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).	xx
Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	xx
Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing).	xx
Operations	
Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.	xx
Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	xx
Use enclosed chutes and conveyors and covered skips.	xx
Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	xx
Ensure equipment is readily available on site to clean any dry spillages, and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.	xx
Waste management	
Avoid bonfires and burning of waste materials.	xx

Measures specific to demolition

Mitigation Measure	Medium Risk
Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	x
Ensure effective water suppression is used during demolition operations. Hand held sprays are more effective than hoses attached to equipment as the water can be directed to where it is needed. In addition high volume water suppression systems, manually controlled, can produce fine water droplets that effectively bring the dust particles to the ground.	xx
Avoid explosive blasting, using appropriate manual or mechanical alternatives.	xx
Bag and remove any biological debris or damp down such material before demolition.	xx

Measures specific to earthworks.

Mitigation Measure	High Risk
Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.	xx
Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.	xx
Only remove the cover in small areas during work and not all at once.	xx

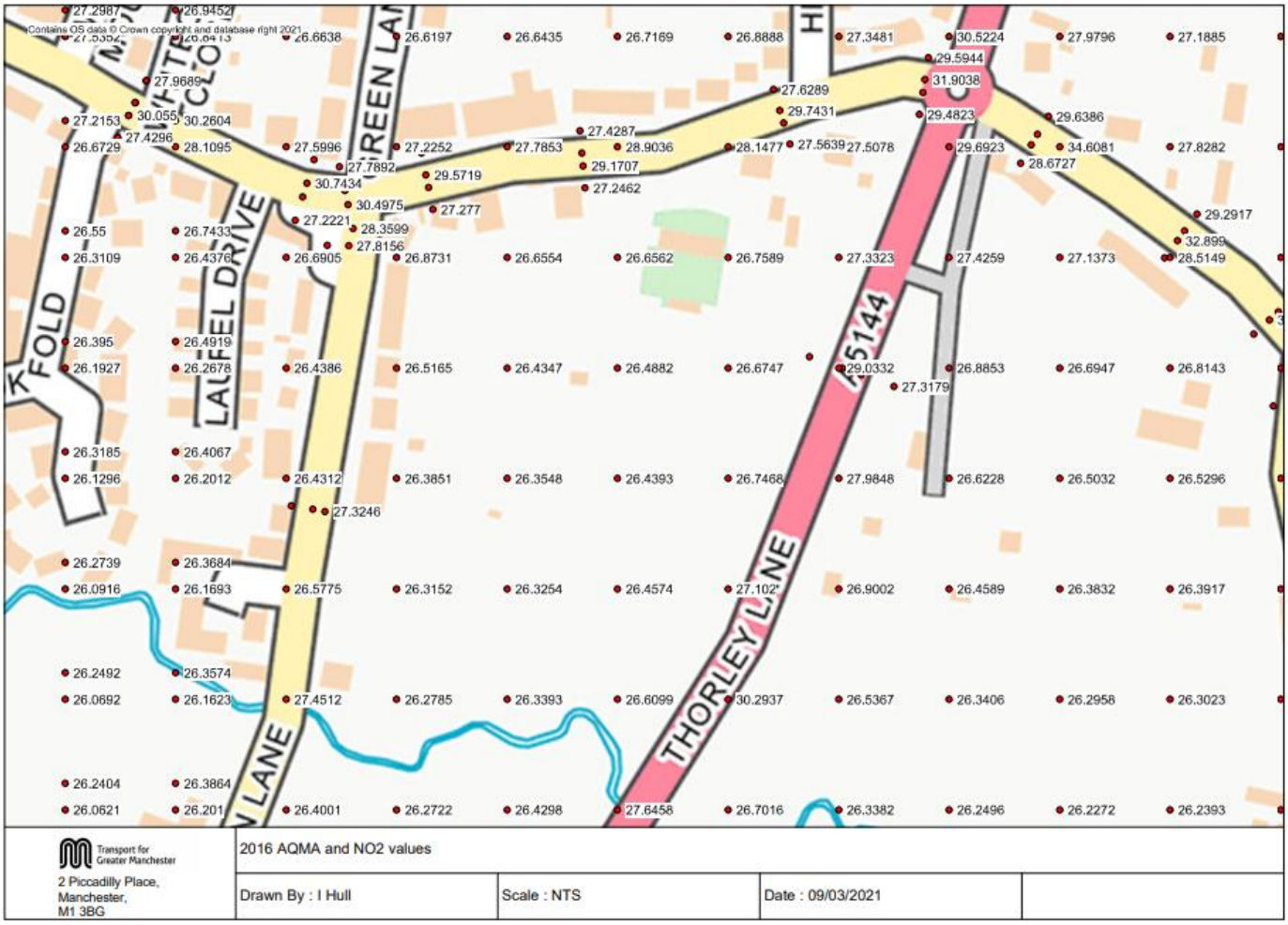
Measures specific to construction.

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

Measures specific to trackout.

Mitigation Measure	Medium Risk
Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use	xx
4. Avoid dry sweeping of large areas..	xx
Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	xx
. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	xx
Record all inspections of haul routes and any subsequent action in a site log book.	xx
Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	xx
Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	xx
Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits	xx
Access gates to be located at least 10 m from receptors where possible.	xx

Appendix E: TfGM 2016 Modelling Output



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Glossary of Terms

AADT Annual Average Daily Traffic flow

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

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

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

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

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

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

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

AQAP Air Quality Action Plan

AQEG Air Quality Expert Group

AQMA Air Quality Management Area

AQMP Air Quality Management Plan

AQO Air Quality Objective

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

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

CO Carbon monoxide

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

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

Defra Department for Environment, Food and Rural Affairs

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

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

DMRB Design Manual for Roads and Bridges

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

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

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

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

EPAQS Expert Panel on Air Quality Standards

EPUK Environmental Protection UK

HDV Heavy Duty Vehicle

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

LAQM Local Air Quality Management

LDF Local Development Framework

LDV Light Duty Vehicle

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

NO_2 Nitrogen Dioxide

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

NPPF National Planning Policy Framework

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

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

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

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

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

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

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

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

RSS Regional Spatial Strategy

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

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

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