MEC Consulting Group

ACOUSTIC AIR

Land West of Ratby, Leicestershire

Air Quality Assessment

February 2025

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Air Quality Assessment
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REGISTRATION OF AMENDMENTS

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APPENDICES

1.0 INTRODUCTION

1.1 MEC Consulting Group Ltd (MEC) has been commissioned by Lagan Homes to undertake an Air Quality Assessment for a proposed residential development at Land West of Ratby, Leicestershire (hereafter referred to as 'the Site').

Existing Site

1.2 The Site is located on the western edge of Ratby, and covers an area of approximately 384,000sqm. The Site is bound to the north by Markfield Road; to the east by existing residential dwellings, to the south by Desford Lane and agricultural buildings and to the west by woodland and agricultural land.

1.3 An approximate redline boundary for the Site is presented in Figure 1.1.

Figure 1.1: Approximate Redline Boundary

Development Proposals

1.4 The description of development is as follows:

"*Outline planning application (with all four matters reserved apart from access) for a phased mixed-use development comprising about 470 dwellings (Use Class C3) or, in the alternative, about 450 dwellings and care home/extra care facility (Use Class C2/C3). Provision of a community hub (Use Class F2); 1FE primary school (Use Class F1); and associated operations and infrastructure including but not limited to site re-profiling works, sustainable urban drainage system, public open space, landscaping, habitat creations, internal roads/routes, and upgrades to the public highway.*"

1.5 A framework plan is presented in **Appendix A**.

Assessment Scope

1.6 This Air Quality Assessment seeks to examine the impact of development generated road traffic emissions upon existing receptors adjacent to local roads. The key traffic related pollutants considered are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$).

1.7 The assessment has been undertaken with reference to the advice provided within the Land-Use Planning and Development Control: Planning for Air Quality, and 'Guidance from Environmental Protection UK', May 2017, and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes.

1.8 In addition, a Construction Dust Risk Assessment has been undertaken in accordance with the 'Guidance on the assessment of dust from demolition and construction' 2024.

Disclaimer

1.9 MEC has completed this report for the benefit of the individuals referred to in Paragraph 1.1 and any relevant statutory authority which may require reference in relation to approvals for the proposed development. Other third parties should not use or rely upon the contents of this report unless explicit written approval has been gained from MEC.

1.10 MEC accepts no responsibility or liability for:

a) The consequence of this documentation being used for any purpose or project other than that for which it was commissioned;
b) The issue of this document to any third party with whom approval for use has not been agreed.

2.0 AIR QUALITY STANDARDS

2.1 The principal air quality standards applied within the UK are the standards and objectives that were initially formulated within the Air Quality (England) Regulations 2000 (AQR) as amended in 2002. These were enacted as part of the UK National Air Quality Strategy (AQS) under Section 80 of the Environment Act 2021, and implement relevant directives of the European Union (EU). The latest version of the UK AQS was published in 2007.

2.2 It is important to note the distinction between air quality standards and objectives. Although the AQ Standards (AQS) define concentration levels that will avoid or minimise risks to health, they do not necessarily reflect levels that are presently technically feasible or economically efficient. In contrast, the AQ Objectives (AQO) have been set with regard to what is realistically achievable within a specified timetable. The approach adopted by the Strategy is to apply the objectives, where members of the public, in a non-occupational capacity and at locations close to ground level, are likely to be exposed over the averaging time of the objective, for example, over 1-hour, 24-hour or annual periods as appropriate.

2.3 Under the Environment Act 2021, Local Authorities must review and document local air quality within their areas by way of a staged appraisal and respond accordingly, with the aim of meeting the air quality objectives by the years defined in the Regulations. Where the objectives of the Regulations are not likely to be achieved by the objective year, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it will try to meet air quality standards in future.

2.4 The Strategy's current air quality objectives for NO_2, PM_{10} and $PM_{2.5}$, for the protection of human health are summarised in Table 2.1 below. Definitions of units and terms used to quantify air pollutant concentrations are provided in **Appendix B**.

Table 2.1: UK Air Quality Objectives for Protection of Human Health

Pollutant	Concentration	Measured as
Nitrogen dioxide	200 μg/m^3	1 hour mean not to be exceeded more than 18 times per year
	40 μg/m^3	Annual mean
Particles (PM_{10} gravimetric)		
All authorities	50 μg/m^3	Daily mean not to be exceeded more than 35 times a year
	40 μg/m^3	Annual mean
Particles ($PM_{2.5}$ gravimetric)	20 μg/m^3 (target)	Annual mean
	12 μg/m^3	2028 Interim target[(a)]
	10 μg/m^3	Legally binding target 2040[(a)]
[(a)] The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023		

2.5 The UK Government has also set NO_2 objectives for 2010 that must be met by all member states, although these 2010 EU NO_2 objectives are equal to the UK Air Quality Strategy NO_2 2005 objectives.

2.6 The pollutants of most concern to planning authorities in urban areas, due to the high concentrations presently encountered (of which local road traffic makes a large contribution) are NO_2, PM_{10} and $PM_{2.5}$.

National Planning Policy Framework

2.7 The latest National Planning Policy Framework (NPPF), issued by the Ministry of Housing, Communities and Local Government in 2024, sets out the Government's planning policies for England and how these are to be expected to be applied. The NPPF must be taken into account in the preparation of local and neighbourhood plans, and is to be a material consideration in planning decisions.

2.8 Paragraph 187 of the NPPF advises that, with respect to air quality, planning policies and decisions should contribute to and enhance the natural and local environment by *"...preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans*".

2.9 Further, paragraph 199 advises that "*Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas. Opportunities to improve air quality or mitigate impacts should be identified, such as through traffic and travel management, and green infrastructure provision and enhancement. So far as possible these opportunities should be considered at the plan-making stage, to ensure a strategic approach and limit the need for issues to be reconsidered when determining individual applications. Planning decisions should ensure that any new development in Air Quality Management Areas and Clean Air Zones is consistent with the local air quality action plan*."

Planning Practice Guidance

2.10 In 2019, the Department for Communities & Local Government updated its on-line planning guidance to assist with interpretation of the NPPF. The guidance covers general matters such as relevance of air quality issues, role of the Local Plan, information sources, assessment approaches and mitigation. How considerations about air quality fit into the development management process is summarised by the guidance in a flowchart, which is included here in **Appendix C**.

Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) – Land-Use Planning & Development Control: Planning for Air Quality 2017

2.11 Environmental Protection UK (EPUK) and the Institute of Air Quality Management (IAQM) have produced this guidance to ensure that air quality is adequately considered in the land-use planning and development control processes.

2.12 The guidance clarifies when an air quality assessment is required and what it should contain. It sets out how impacts should be described and assessed. Importantly it sets out a recommended approach that can be used to assess the significance of the air quality impacts, taking account of the advice issued by IAQM. An

important focus of this guidance is on minimising the air quality impacts of all developments for which air quality assessments have been requested by the planning authority; this will be through good design and application of appropriate mitigation measures.

2.13 Stage 1 of the assessment in the local area seeks to screen out smaller development and/or developments where impacts can be considered to have insignificant effects. The Stage 1 criteria are set out in Table 2.2 and require any of the criteria in row A, coupled with any of the criteria in row B, to apply before an assessment proceeds to Stage 2. If none of the criteria are met then the impacts can be considered to be insignificant and there is no requirement to carry out an air quality assessment.

Table 2.2: Stage 1 Criteria

Criteria to Proceed to Stage 2
If any of the following apply: • 10 or more residential units or a site of more than 0.5 ha • more than 1,000 m^2 of floor space for all other uses or a site area greater than 1 ha
Coupled with any of the following: • the development has more than 10 parking spaces • the development will have a centralised energy facility or other centralised combustion process
Note: Consideration should still be given to the potential impacts of neighbouring sources on the site, even if an assessment of impacts of the development on the surrounding area is screened out.

2.14 The criteria in Table 2.3 provide more specific guidance as to when an air quality assessment is likely to be required to assess the impacts of the proposed development on the local area.

Table 2.3: Indicative Criteria for Requiring an Air Quality Assessment

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic flows on local roads with relevant receptors. (LDV = cars and small vans<3.5t gross vehicle weight)	A change of LDV flows of: more than 100 AADT within or adjacent to an AQMA more than 500 AADT elsewhere
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors. (HDV = goods vehicles + buses >3.5t gross vehicle weight)	A change of HDV flows of: more than 25 AADT within or adjacent to an AQMA more than 100 AADT elsewhere
Realign roads, i.e. changing the proximity of receptors to traffic lanes.	Where the change is 5m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate/decelerate, e.g. traffic lights, or roundabouts.
Introduce or change a bus station.	Where bus flows will change by: more than 25 AADT within or adjacent to an AQMA more than 100 AADT elsewhere.
Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20m of a relevant receptor Coupled with the car park having more than 100 movements per day (total in and out)
Have one or more substantial combustion processes.	Where the combustion unit is: any centralised plant using bio fuel any combustion plant with single or combined thermal input >300kW

The development will:	Indicative Criteria to Proceed to an Air Quality Assessment
	a standby emergency generator associated with a centralised energy centre (if likely to be tested/used >18 hours a year)
Have a combustion process of any size.	Where the pollutants are exhausted from a vent or stack in a location and at a height that may give rise to impacts at receptors through insufficient dispersion. This criterion is intended to address those situations where a new development may be close to other buildings that could be residential and/or which could adversely affect the plume's dispersion by way of their size and/or height.

2.15 Where an air quality assessment is identified as being required, this may be either a Simple or a Detailed Assessment. A Simple Assessment is one relying on already published information and without quantification of impacts, in contrast to a Detailed Assessment that is completed with the aid of a predictive technique, such as a dispersion model. Passing a criterion in Table 2.3 does not automatically lead to the requirement for a Detailed Assessment. Once again, where none of the criteria are met the impacts can be considered to be insignificant and there is no requirement to carry out an air quality assessment.

2.16 The purpose of the air quality assessment is to define the likely quantitative or qualitative changes in air quality or exposure to air pollution as a result of the proposed development.

2.17 The suggested framework for describing the impacts on the basis set out above is set out in Table 2.4. The term Air Quality Assessment Level (AQAL) is used to include air quality objectives or limit values, where these exist. The Table is only intended to be used with annual mean concentrations, and all % changes are rounded up or down to whole numbers. At exposures less than 75% of the AQAL, the degree of harm is described as likely to be small. As the exposure encroaches and exceeds the AQAL the degree of harm increases, and the change becomes more important when the result is an exposure that is approximately equal to or greater than the AQAL.

Table 2.4: Impact Descriptors for Individual Receptors

Long term average Concentration at receptor in assessment year	% Change in concentration relative to Air Quality Assessment Level (AQAL)			
	1	2-5	6-10	>10
75% or less of AQAL	Negligible	Negligible	Slight	Moderate
76-94% of AQAL	Negligible	Slight	Moderate	Moderate
95-102% of AQAL	Slight	Moderate	Moderate	Substantial
103-109% of AQAL	Moderate	Moderate	Substantial	Substantial
110% or more of AQAL	Moderate	Substantial	Substantial	Substantial

2.18 A judgement of the significance of the impacts is to be made by a competent professional who is suitably qualified, and the reasons for reaching the conclusions should be transparent and set out logically. Whilst the starting point for the assessment of significance is the degree of impact, as defined by Table 2.4, this should be seen as only one of the factors for consideration, not least because the outcome of this assessment procedure applies to a receptor and not the overall impact of the scheme on the locality.

2.19 The guidance also makes it clear that the presence of an AQMA should not halt all development, but where development is permitted, the planning system should ensure that any impacts are minimised as far as is practicable. Even where developments are proposed outside of AQMAs, and where pollutant concentrations are predicted to be below the objectives/limit values, it remains important that the proposed development incorporates good design principles and best practice measures and that emissions are fully minimised.

Construction Dust Nuisance

2.20 There is no specific guidance relating to the assessment of construction dust nuisance within Government documents such as the DMRB. Consequently, guidance from relevant national bodies provides the best advice for establishing the potential impacts from dust. Research carried out by the Buildings Research Establishment (BRE) indicates that the likelihood of complaints concerning dust nuisance is related to the distance of receptors from a construction site and the duration of dust raising activities. This relationship is shown in Table 2.5.

Table 2.5: Likelihood of Dust Complaints by Distance

Duration of dust raising activity onsite	Distance from site			
	< 20 m	20 – 50 m	50 – 100 m	100 – 150 m
	Likelihood of complaint			
> 12 months	Very Likely	Very Likely	Likely	Potential Likelihood
6 – 12 months	Very Likely	Likely	Likely	Potential Likelihood
< 6 months	Very Likely	Likely	Potential Likelihood	Not Likely

Note: Beyond 150 m dust nuisance is considered largely unlikely (Upton & Kukadia, 2002, Measurements of PM_{10} from a Construction Site: A Case Study, prepared by BRE Environment for National Society for Clean Air).

2.21 Further empirically derived measures of the maximum distance from a source of airborne dust within which significant adverse effects are likely to be observed, are presented in Table 2.6. These values reflect qualitative estimates derived from historical data presented within environmental assessment reports and expert evidence.

Table 2.6: Qualitative Construction Dust Assessment Criteria

Source Descriptors		Zone for Potentially Significant Effects (Distance from Source)	
Source	Duration	Soiling	PM_{10}*
Large construction sites	1 year or more	100 m	25-50 m
Moderate sized construction sites	Months	50 m	15-30 m
Minor construction sites	Weeks	25 m	10-20 m

*Based on 35 permitted exceedances of 50 µg/m^3 in a year, as defined in The Air Quality (England) Regulations.
Source: Adapted from Thames Gateway Bridge – Environmental Statement (Laxen, 2004)

Dust Risk Assessment

2.22 The Institute of Air Quality Management (IAQM) Guidance on the assessment of dust from demolition and construction, January 2024, provides a framework for the assessment of risk.

2.23 The guidance divides activities on construction sites into four types to reflect their different potential impacts. These are:

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

2.24 The assessment methodology considers the following three separate dust effects, with account being taken of the distance of the receptors that may experience these effects.

- Annoyance due to dust soiling;
- Harm to ecological receptors; and
- The risk of health effects due to a significant increase in exposure to PM_{10}.

2.25 The assessment procedures and risk categories for each of the four phases of construction where the potential for dust is high, i.e., those listed above, are summarised in **Appendix D**.

2.26 Step 1 establishes that an assessment will normally be required where there are dwellings within 250m of the Site boundary.

3.0 LOCAL AUTHORITY AIR QUALITY REVIEW AND ASSESSMENT

Scoping Correspondence

3.1 Scoping discussions have been undertaken with the Environmental Health Department (EHD) at Hinckley and Bosworth Borough Council (HBBC). The assessment methodology was agreed with the council, and full correspondence is provided in **Appendix E.** However, due to the size of the development it was requested that the assessment should also consider the impact on an Air Quality Management Area (AQMA) located within Blaby District Council (BDC), AQMA 3, approximately 2.5km from the Site.

Hinckley and Bosworth Borough Council

3.2 Air quality within the HBBC area is generally good and, to date, and no AQMA have been designated.

3.3 The council's most recently published 2023 Annual Status Report (ASR) states that:

"Overall Air Quality in the Borough is good when compared to the air quality objective value. Measured levels of NO_2 within the borough in 2023 continue to show a decrease when compared to pre-pandemic levels and most sites measured less NO_2 than in 2020."

3.4 HBBC operated a comprehensive network of sixteen non-automatic monitoring locations in 2023, and the most relevant monitoring locations to the Site, i.e., the closest, along with those used within the verification process, are shown in Table 3.1.

Table 3.1: Annual Mean NO_2 Concentrations

Site-ID	Location	Distance to Site (m)	OS Co-ordinates	Annual Mean Concentrations (µg/m^3)				
				2019	2020	2021	2022	2023
11	261 Markfield Road, Groby	1,800	451376, 308147	23.7	19.0	18.8	18.1	17.1

3.5 The results in Table 3.1 show show a gradual decline in concentrations from 2019 to 2023, with monitored concentrations in 2023 being 17.1 µg/m^3, i.e., well below the objective level

Blaby District Council

3.6 BDC currently has five AQMA. All were declared after monitoring, or modelling, indicated an exceedance of the annual mean air quality objective for nitrogen dioxide, of 40 µg/m^3. The AQMAs are as follows:

- AQMA 1: A5460 Narborough Road South – Residential properties along a small section of Narborough Road South to the extent of Blaby District, declared in September 2000, with amendments in January 2018. The AQMA is approximately 6.6 km from the Site.
- AQMA 2: M1 corridor in Enderby and Narborough – Residential properties adjacent to the M1 between around 1.5 km and 3 km south of Junction 21, declared in September 2000, with amendments in 2020. The AQMA is approximately 8.3 km from the Site.
- AQMA 3: M1 corridor between Thorpe Astley and Leicester Forest East – Residential houses adjacent to the M1 and A47 between Thorpe Astley and Leicester Forest East, declared in September 2000, with amendments in 2005 and 2020. The AQMA is approximately 2.5 km from the Site.

- AQMA 4B: Enderby Road, Whetstone – Residential houses along Enderby Road, Whetstone, declared in April 2005, with amendments in 2020. The AQMA is approximately 9.1 km from the Site.
- AQMA 6: Mill Hill, Enderby – Residential properties along Hall Walk and Mill Hill, Enderby, declared in January 2018. The AQMA is approximately 6.3 km from the Site.

3.7 BDC's most recently published 2023 Annual Status Report (ASR) states that "*In 2023, there were no exceedances (once distance corrected) of the Air Quality Objectives for NO_2 recorded in the Blaby District.*"

3.8 BDC operated a comprehensive network of five automatic and fifty passive monitoring locations in 2023, and the most relevant monitoring locations located within AQMA 3 are shown in Table 3.2.

Table 3.2: Annual Mean NO_2 Concentrations

Site-ID	Location	Distance to Site (m)	OS Co-ordinates	Annual Mean Concentrations (µg/m^3)				
				2019	2020	2021	2022	2023
16	The Cottage, Ratby Lane	2,620	453216, 304275	27.9	22.2	21.8	28.1	24.4
54	71 Hinckley Road, LFE	3,455	453591, 303420	26.6	22.1	20.7	22.6	23.6
56	Avalon, 9 Hinckley Road, LFE	3,765	454079, 303535	21.0	15.9	15.8	17.0	16.4
57	6 Ratby Lane, LFE	3,745	454090, 303600	30.0	22.0	24.0	28.3	25.9
93	Former Blaby 3 site LFE	3,260	453140, 303311	-	-	19.9	25.7	19.9
CM4	Balby 4 (Hinckley Road, LFE)	3,825	454020, 303473	38.4	23.3	26.9	23.3	18.9

3.9 The results in Table 3.2 show a gradual decline in concentrations from 2019 to 2023, with monitored concentrations ranged between 16.4 µg/m^3 and 25.9 µg/m^3, i.e. well below the objective level.

3.10 In conclusion, air quality within HBBC and BDC is generally good, with no exceedances of the national air quality objective levels in 2023, included within AQMA 3, which was requested by HBBC. Since 'relevant exposure' is already present adjacent to the Site, i.e., existing residential dwellings are present adjacent to the Site and local roads, and these have already been considered within HBBC and BDC's reviews and assessments, the same conclusions will apply for new dwellings on the Site. Namely, all air quality objectives will be satisfied on the Site and at dwellings adjacent to the routes to the Site.

3.11 Nevertheless, it will be important that the air quality assessment for the proposed development looks at the potential effects of traffic generated by development upon existing dwellings adjacent to local roads to establish that there will be no adverse effects upon their existing standards of air quality. This matter is covered in the following sections.

4.0 METHODOLOGY

General

4.1 The assessment has been undertaken using the atmospheric dispersion modelling package ADMS-Roads Air Quality Management System Version 5.1, developed by Cambridge Environmental Research Consultants Ltd (CERC), to establish air pollutant concentrations at the proposed development.

4.2 The assessment has been undertaken with reference to guidance set out within Defra's LAQM.TG(22), the IAQM and EPUK's 'Guidance on Land-Use Planning and Development Control: Planning for Air Quality 2017 (v1.2)'.

4.3 Specifically, ADMS-Roads has been used to disperse emissions of NO_x, PM_{10} and $PM_{2.5}$ from local road sources and derive resultant road contributions to the concentrations of these pollutants at specific existing receptor locations. When added to the background concentration, this provides an indication of the resulting air quality at each receptor location.

4.4 The ADMS-Roads model requires the input of background pollutant concentration data, hourly traffic flows, annual average vehicle speed, vehicle classification broken down into light and heavy duty vehicles (LDV/HDV), information on the type of road and meteorological data (model inputs are discussed in turn later).

4.5 Current guidance has led to some changes in the way in which NO_2 concentrations should be modelled. In accordance with LAQM.TG(22) the ADMS-Roads model has been used to derive road-based concentrations of NO_x at specific receptor locations. To convert the modelled road-based NO_x to annual NO_2 the 'NO_x to NO_2' calculator (Version 9.1) (available from https://laqm.defra.gov.uk/air-quality/air-quality-assessment/nox-to-no2-calculator/) has been applied to all modelled results.

Assessment Scenarios

4.6 The assessment seeks to establish air pollutant concentrations at identified receptor locations as shown in **Appendix F**. The following scenarios, informed by available HBDC and BDC NO_2 monitoring data and the Transport Assessment work, have been included in the assessment:

- 2023 Model Verification;
- 2028 Do Nothing (2028 DN) i.e., Baseline + Committed Developments;
- 2028 Do Something (2028 DS) i.e., 2028 DN + Proposed Development;
- 2031 Do Nothing (2031 DN) i.e., Baseline + Committed Developments; and
- 2031 Do Something (2031 DS) i.e., 2031 DN + Proposed Development.

Local Road Network

4.7 Local road sources have been input into the model using the interface between ADMS-Roads and the ADMS-Roads mapper, which enables roads to be input according to their geographic location using OS base mapping of the local area. Road/carriageway widths have been informed from OS base and aerial mapping.

Traffic Data & Emissions

4.8 To inform emissions from the road source included within the model, traffic flows for the surrounding road network have been provided by the project's Transport Consultant (Pell Frischmann). The available traffic flow data, % HGV and average speed assumptions for each assessment scenario are provided in **Appendix G** for information.

4.9 Emission rates for each road source have been derived from traffic flow data using the Emission Factor Toolkit (EFT), Version 12.0, published by Defra and the devolved administrations in December 2023. The EFT is incorporated within ADMS-Roads Extra. The EFT allows users to calculate road vehicle pollutant emission rates for pollutants for a specified year, road type, and vehicle speed and vehicle fleet composition.

Background Concentrations

4.10 Background concentrations of NO_2, NO_x, PM_{10} and $PM_{2.5}$ have been obtained from the 2021-based maps available on the Defra website (https://uk-air.defra.gov.uk/data/laqm-background-homel) which provide estimated background pollutant concentrations for each 1kmx1km grid square in the UK.

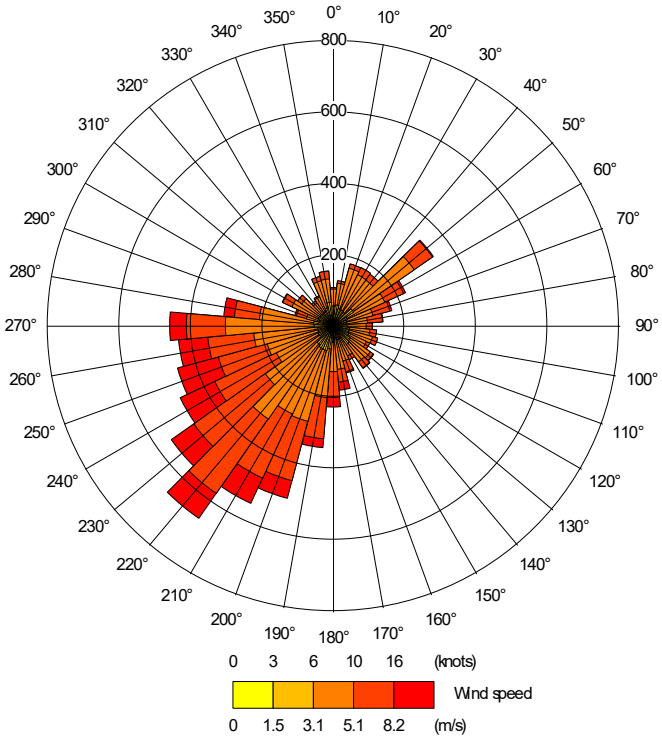
4.11 As the background maps provide data for individual pollutant sectors, those sectors relating to road traffic have been removed to avoid double counting of road emissions. As only total background concentrations are provided for NO_2, the NO_2 map has been adjusted using the online NO_2 Adjustment for NO_x Sector Removal Tool (Version 9.0), https://laqm.defra.gov.uk/air-quality/air-quality-assessment/no2-adjustment-for-nox-sector-removal-tool/.

Meteorology

4.12 The closest meteorological station is East Midlands Weather Station, located at a distance of approximately 21km from the Site.

4.13 The windrose for East Midlands Weather Station is presented in Figure 4.1. The predominant wind direction associated with the highest wind speeds, is from the southwest.

Figure 4.1: East Midlands Weather Station 2023



Verification

4.14 To determine how well the model is performing and to correct any over or under estimation of pollutant concentrations, LAQM.TG(22) recommends a verification process that should be applied. Verification involves a comparison between predicted and measured 'road traffic contributions' at one or more local sites and adjustment of the modelled concentrations where necessary.

4.15 HBBC and BDC monitored results used within the verification process are shown in Table 4.1 below.

Table 4.1: Monitoring Data Used in Verification

Local Authority	Site-ID	OS Co-ordinates	Annual Mean Concentrations (µg/m^3)
			2023
BDC	16	453216, 304275	24.4
	54	453591, 303420	23.6
	56	454079, 303535	16.4
	57	454090, 303600	25.9
	93	453140, 303311	19.9
	CM4	454020, 303473	18.9
HBBC	11	451376, 308147	17.1

4.16 The derived adjustment factor is 1.4, and has been applied to all modelled road contribution NO_x, PM_{10} and $PM_{2.5}$. Details of this verification process are included in **Appendix H.** In order to get to the verification factor shown above, a reduction of assumed road speeds along the existing roads has been applied.

4.17 In addition to this, a Root Mean Square Error (RMSE) has been calculated to determine the error within the calculations. The calculations for the RMSE are also provided in **Appendix H**. The calculated RMSE is

3.6 µg/m^3, which correlates to an error ratio of less than 10%. The RMSE means that modelled results could be under or over predicting pollution concentrations by between +/- 3.6 µg/m^3.

4.18 It is considered that any attempts to reduce the verification factor further, would not be representative of the real world conditions at the links in question. Nevertheless, the calculated RMSE is less than 10% and is showing acceptable correlation.

5.0 AIR QUALITY ASSESSMENT

General

5.1 This section of the report outlines the findings of the assessment discussed in Section 5.0. Having established the likely change in pollutant concentrations arising from the 'do something' assessment scenarios, the potential local air quality impact of the proposed development has been described using the approach set out in the IAQM and EPUK 'Guidance on Land-Use Planning and Development Control: Planning for Air Quality 2017'.

5.2 EPUK Guidance suggests a two stage process to be followed in the assessment:

- A qualitative or quantitative description of the impacts on local air quality arising from the development; and
- A judgement on the overall significance of the effects of any impacts.

5.3 For air quality impacts on the surrounding area, i.e., existing receptors, a practical way of assigning a meaningful description to the degree of an impact is to express the magnitude of incremental change as a proportion of the relevant assessment level and then to examine this change in the context of the new total concentration and its relationship with the assessment criterion. The suggested IAQM/EPUK framework for describing the impacts on the basis set out above is shown in Table 2.4.

Results

5.4 The findings of the assessment of pollutant concentrations at each of the receptor locations for the modelled scenarios are discussed below.

5.5 These results should be compared with the objectives listed in Table 2.1, and summarised as follows:

- NO_2 average annual mean not to exceed 40 μgm^3;
- PM_{10} average annual concentrations not to exceed 40 μgm^3; and
- $PM_{2.5}$ average annual concentrations not to exceed:
    - 20 μgm^3 present to 2028
    - 12 μgm^3 2028 to 2040

Nitrogen Dioxide (NO_2)

5.6 The results in **Appendix I** indicate that for the baseline do-nothing scenario, all receptors have values below the current annual mean air quality objectives (40 $\mu g/m^3$) for NO_2, which is consistent HBBC and BDC's review and assessment data.

5.7 With traffic generated by development, i.e., the 'do something' scenario for both assessment years, the absolute concentrations remain below the current air quality objectives and the incremental change due to traffic generated by development is small (1.1 $\mu g/m^3$ or less to annual mean concentrations of NO_2), which would not have a significant impact upon local air quality.

5.8 The impact significance in accordance with the EPUK/IAQM guidance indicates that for all receptors, the impact due to development is classed as 'Negligible', and none of the changes exceed 3% of the AQAL.

5.9 With regard to the 1-hour mean objective LAQM.TG(22) advises that *"A study carried out on behalf of Defra and the Devolved Administrations identified that exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60 µg/m³".* As the results in **Appendix I** indicate annual mean concentrations of NO_2 will remain below 60 µg/m³, it is considered that the NO_2 1-hour objective will not be exceeded at any receptor.

Particulate Matter (PM_{10})

5.10 The results in **Appendix I** indicate that for the baseline do-nothing scenario, receptors adjacent to all roads have values below the current annual mean air quality objectives (40 µg/m³) for PM_{10}.

5.11 With traffic generated by development, i.e., the do-something scenario for both assessment years, the absolute concentrations remain below the current air quality objectives and the incremental change due to traffic generated by development is small (0.45 µg/m³ or less to annual mean concentrations of PM_{10}), which would not have a significant impact upon local air quality.

5.12 The impact significance in accordance with the EPUK/IAQM guidance indicates that for all receptors, impact due to development is classed as 'Negligible', and none of the changes exceed 1% of the AQAL.

Particulate Matter ($PM_{2.5}$)

5.13 The results in **Appendix I** indicate that for the baseline do-nothing scenario, receptors adjacent to all roads have values below the interim target (12 µg/m³) for $PM_{2.5}$.

5.14 With traffic generated by development, i.e., the do-something scenario for both assessment years, the absolute concentrations remain below the interim target and the incremental change due to traffic generated by development is small (0.23 µg/m³ or less to annual mean concentrations of $PM_{2.5}$), which would not have a significant impact upon local air quality.

5.15 The impact significance in accordance with the EPUK/IAQM guidance indicates that for all receptors, impact due to development is classed as 'Negligible', and none of the changes exceed 2% of the AQAL.

5.16 It should be noted that the above effects reflect a worst-case scenario, with the future year scenarios modelled using future year traffic flow data, together with 2025 background and emissions data, to account for current uncertainty in future year projections. Background concentrations and vehicle emission factors are projected to decrease year on year, as new Euro standards and UK fleet turnover are assumed. Using 2025 data therefore provides a conservative case for the future year scenarios. In reality, pollutant concentrations may be lower.

5.17 Using the significance flowchart in **Appendix C**, air quality is not considered to be a significant consideration and the proposed development can proceed to a planning decision with conditions where appropriate.

5.18 Since the air quality assessment indicates that the annual mean air quality objective will be met at the most exposed receptor locations, and since the actual changes due to traffic generated by development are small, and not significant, it can be concluded that the air quality at the Site is acceptable for development, and that development traffic will not lead to significant adverse impact upon existing air quality.

Construction Dust Risk Assessment

5.19 Nuisance dust impacts are likely to be temporary and episodic (most noticeable during dry windy conditions) and would not persist beyond completion of construction.

5.20 Where dust raising activities are present for 12 months or more, dust complaints are considered to be very likely for those closest receptors to the Site that lie between 20-50m from the Site boundary. Therefore, appropriate dust mitigation measures will be required to minimise dust emissions from the Site.

5.21 In addition, the qualitative dust assessment criteria in Table 2.6 indicates that existing premises adjacent to the Site will lie within the zone for potentially significant effects for soiling and ambient concentrations of PM_{10}.

5.22 Applying IAQM risk assessment procedures as set out in **Appendix D** requires an assessment where there are sensitive receptors within 250m of the Site boundary of the works and/or within 100m of the routes used by construction vehicles on the public highway up to 500m from the Site entrance. Existing premises fall within 250m zone which triggers the initial screening criterion.

5.23 The stages considered by the dust risk assessment are presented in Table 5.1. The assessments and conclusions are based upon the classifications for a 'Small' site for demolition and a 'Large' site for earthworks, construction and track-out, because the total working area for the various activities meets the relevant thresholds. There are no known ecological areas within 50m of the works.

Table 5.1: Dust Risk Assessment

Step	Consideration	Demolition	Earthworks	Construction	Track-out
2a	Scale/nature of works	Small	Large	Large	Large
2b	Sensitivity of area:				
	To dust soiling	Low	High	High	High
	To PM10 health effects	Low	Low	Low	Low
	To ecological effects				
2c	Risk of impacts	Negligible Risk	High Risk	High Risk	High Risk

5.24 The assessments in Table 5.1 and the IAQM matrices have been used to define the Site-specific mitigation requirements for the construction phases and the overall risk assessment for dust from the construction works is summarised in Table 5.2.

Table 5.2: Summary Dust Risk Table to define Site-Specific Mitigation

Source	Dust Soiling Effects	PM_{10} Effects	Ecological Effects
Demolition	Negligible Risk	Negligible Risk	-
Earthworks	High Risk	Low Risk	-
Construction	High Risk	Low Risk	-
Track-out	High Risk	Low Risk	-

5.25 With regard to dust soiling, the risk assessment indicates that on the basis of no mitigation being present, the demolition phase would present a 'Negligible Risk', whereas all other phases would present a 'High Risk'.

5.26 With regard to PM_{10} effects, the risk assessment indicates that on the basis of no mitigation being present, the demolition phase would present a 'Negligible Risk', whereas all other phases would present a 'Low Risk'.

5.27 The IAQM guidance on the mitigation measures needed to deal with low, medium or high risk effects is set out in **Appendix J**.

6.0 MITIGATION

6.1 Assessment has shown that the annual mean air quality objectives will be met at the most exposed receptor locations, and the Site is acceptable for residential development. It is therefore considered that development-specific mitigation will not be required to reduce or offset road traffic emissions.

6.2 Nevertheless, to assist in offsetting incremental creep in pollutant emissions, a number of sustainable travel measures should be considered, these are follows:

- Electric vehicle charging – in accordance with Approved Document S, adopted in June 2022;
- Low NO_x heating and boilers;
- Monitored Travel Plan;
- Measures to support public transport infrastructure and promote use; and
- Measures to support cycling and walking infrastructure.

Construction Dust

6.3 It is recommended that the relevant mitigation presented in **Appendix J**, appropriate for a 'High Risk' site, should be routinely included in the Site's dust management plan for the relevant phase of construction. Key measures known to minimise dust emissions and represent good practice guidance are summarised in Table 6.1.

Table 6.1: Key Dust Mitigation Measures

Aspect	Mitigation Measures
Site Planning	No bonfires
	Plan site layout - machinery and dust causing activities should be located away from sensitive receptors
Construction Traffic	All vehicles should switch off engines when not in active use – no idling vehicles
	Wash or clean all vehicles effectively before leaving the site if close to sensitive receptors
	All loads entering and leaving site to be covered
	No site runoff of water or mud
	All non-road mobile machinery (NRMM) to use ultra low sulphur tax-exempt diesel (ULSD) where available
Demolition Works	Use water as dust suppressant
	Cutting equipment to use water as suppressant or suitable local exhaust ventilation systems
	Securely cover skips and minimize drop heights
Site Activities	To employ best practicable means in the control of dust
	Minimise dust generation activities
	Use water as dust suppressant where possible
	Keep stockpiles for the shortest possible times
Site Management	Appointment of a site agent whose contact details are provided to the LPA's Environmental Health Department and local residents prior to construction works starting.
	Agent to provide immediate response to any complaints by logging details of complaint and investigating source of complaint to establish whether routine mitigation measures have been properly implemented. If necessary, appropriate steps to be taken to mitigate against any adverse effects, and details of actions to be logged.

7.0 CONCLUSIONS

7.1 MEC has been commissioned by Lagan Homes to undertake an Air Quality Assessment for a proposed residential development at land west of Ratby.

7.2 This Air Quality Assessment seeks to examine the impact of development generated road traffic emissions upon existing receptors adjacent to local roads. The key traffic related pollutants considered are nitrogen dioxide (NO_2) and particulate matter (PM_{10} and $PM_{2.5}$).

7.3 The assessment has been undertaken with reference to the advice provided within the Land-Use Planning and Development Control: Planning for Air Quality, 'Guidance from Environmental Protection UK', the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes', May 2017, and the 'Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance' 2024.

7.4 The following scenarios have been included in the assessment:

- 2023 Model Verification;
- 2028 Do Nothing (2028 DN) i.e., Baseline + Committed Developments;
- 2028 Do Something (2028 DS) i.e., 2028 DN + Proposed Development;
- 2031 Do Nothing (2031 DN) i.e., Baseline + Committed Developments; and
- 2031 Do Something (2031 DS) i.e., 2031 DN + Proposed Development.

7.5 The future year scenarios have been modelled using future year traffic flow data, together with 2025 background and emissions data, to account for current uncertainty in future year predictions.

7.6 The model has been verified using 2023 NO_2 monitoring data provided by HBBC and BDC. The verification has derived an adjustment factor of 1.4, which has been applied to all modelled outputs.

Nitrogen Dioxide (NO_2)

7.7 The results indicate that for the baseline do-nothing scenario, all receptors have values below the current annual mean air quality objectives (40 µg/m^3) for NO_2.

7.8 The incremental change due to traffic generated by development is small (1.1 µg/m^3 or less to annual mean concentrations of NO_2), which would not have a significant impact upon local air quality. The impact due to development is classed as 'Negligible', and none of the changes exceed 3% of the AQAL.

7.9 With regard to the 1-hour mean objective LAQM.TG(22) advises that "*A study carried out on behalf of Defra and the Devolved Administrations identified that exceedances of the NO_2 1-hour mean are unlikely to occur where the annual mean is below 60 µg/m^3*". As the results indicate annual mean concentrations of NO_2 will remain below 60 µg/m^3, it is considered that the NO_2 1-hour objective will not be exceeded at any receptor.

Particulate Matter (PM_{10})

7.10 Annual mean PM_{10} concentrations are also expected to remain below the annual mean objective at all assessed receptor locations for all scenarios.

7.11 The incremental change due to traffic generated by development is small (0.23 µg/m^3 or less to annual mean concentrations of PM_{10}), which would not have a significant impact upon local air quality. The impact due to development is classed as 'Negligible', and none of the changes exceed 1% of the AQAL.

Particulate Matter ($PM_{2.5}$)

7.12 Annual mean $PM_{2.5}$ concentrations are predicted to remain below the objective for all receptor locations.

7.13 The incremental change due to traffic generated by development is small (0.23 µg/m^3 or less to annual mean concentrations of $PM_{2.5}$), which would not have a significant impact upon local air quality. The impact significance in accordance with EPUK/IAQM guidance indicates that for all receptors, impact due to development is classed as 'Negligible', and none of the changes exceed 2% of the AQAL.

7.14 It should be noted that future year scenario has been modelled using future years traffic flow data, together with 2025 background and emissions data, to account for current uncertainty in future year projections, thus providing a robust assessment.

7.15 Therefore, the air quality assessment indicates that the annual mean air quality objective will be met at the most exposed receptor locations, and since the actual changes due to traffic generated by development are small, and not significant, it can be concluded that the air quality at the Site is acceptable for development, and that development traffic will not lead to significant adverse impact upon existing air quality.

7.16 Mitigation measures have been proposed to minimise the potential effects associated with increased air pollutant concentrations.

Construction Dust Risk Assessment

7.17 With regard to dust soiling, the risk assessment indicates that on the basis of no mitigation being present, the demolition phase would present a 'Negligible Risk', whereas all other phases would present a 'High Risk'.

7.18 With regard to PM_{10} effects, the risk assessment indicates that on the basis of no mitigation being present, the demolition phase would present a 'Negligible Risk', whereas all other phases would present a 'Low Risk'.

7.19 The relevant mitigation measures presented in the IAQM guidance for a 'High Risk' site should be routinely included in the Site's dust management plan for the relevant earthworks and construction phases.

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APPENDICES

APPENDIX A

NOTES

0 50 100 150 200m

N

KEY

- Site Boundary 32.7ha
- Residential Development (Residential (13.5ha) c. 470 Units @ 35 dph)
- EC (Residential (12.9ha) c. 450 Units @ 35 dph + 0.6ha Extra Care
- Green Infrastructure 17ha (Includes retained vegetation, new planting, habitat creation, accessible green space and drainage basins)
- Access Points (See application plans for access drawings)
- Primary Street - Access Road (Indicative alignment)
- Recreational Routes (Indicative)
- Primary School (1FE) 1.0ha
- Community Hub 0.2ha
- Drainage Basins
- Additional Pond
- Existing Vegetation
- National Forest Planting Area (As part of Lagan Homes - 20/00462/FUL)
- Structural Planting (Indicative)
- Existing Public Rights of Way
- Children's Equipped Play
- Section of Burroughs Road to be pedestrian-cycle only

NOTES

Capacity masterplan based of topographical data, see drawing; *'43724_T_REV4'*

rev	date	description	drn	chk
P13	10/07/2024	Addition of Pond and Hedgerows	SJL	BC
P12	19/06/2024	Amended PRoW Alignment & additional access point	SJL	BC

masterplanning
environmental assessment
landscape design
urban design
ecology
architecture
arboriculture

FPCR Environment and Design Ltd
Lockington Hall
Lockington
Derby
DE74 2RH

t: 01509 672772
e: mail@fpcr.co.uk
w: www.fpcr.co.uk

client
Lagan Homes Ltd

project
(Burrough Field) Land West of Ratby, Leicestershire

drawing title
Framework Plan

scale	drn	chk	date created
1:2000 @ A1	SJL	BC	10 July 2024

project number	status	issue
10783	S3	P13

document number
10783-FPCR-XX-XX-DR-L-0007
Project Code - Originator - Zone - Level - Type - Role - Drawing Number

File: 1FPCR-FS-01\Projects\10783\10783LAND\CD\working\10783-FPCR-XX-XX-DR-L-0007-P13-Framework Plan.vwx

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APPENDIX B

DEFINITION OF AIR QUALITY TERMS AND UNITS

ppm	parts per million - defines the units of pollution in every million (10^6) units of air.
ppb	parts per billion - defines the units of pollution in every billion (10^9) units of air.
$\mu g/m^3$	microgrammes per cubic metre - one microgramme is one millionth of a gram.
ng/m^3	nanogrammes per cubic metre – one nanogramme is one milliardth (i.e. one thousand millionth of a gram (10^{-9}))
Annual mean	the average of the concentrations measured for one year.
1-hour mean	the average of the concentrations measured for one hour.
24-hour mean	the average of the concentrations measured for twenty four hours.
Running mean	the mean or series of means calculated for overlapping time periods. For example, an 8-hour running mean is calculated every hour and averages the values for eight hours. The period of averaging is stepped forward by one hour for each subsequent value so that a degree of overlap exists between successive values. Non-running means are calculated for consecutive time periods so that there is no overlap.
Percentile	a value that establishes a particular threshold in a collection of data. For example, the 90^{th} percentile of yearly values is the value that 90% of all the data in the year fall below or equal.
Exceedance	a period of time when the concentration of a pollutant is greater than, or equal to, the relevant air quality standard.

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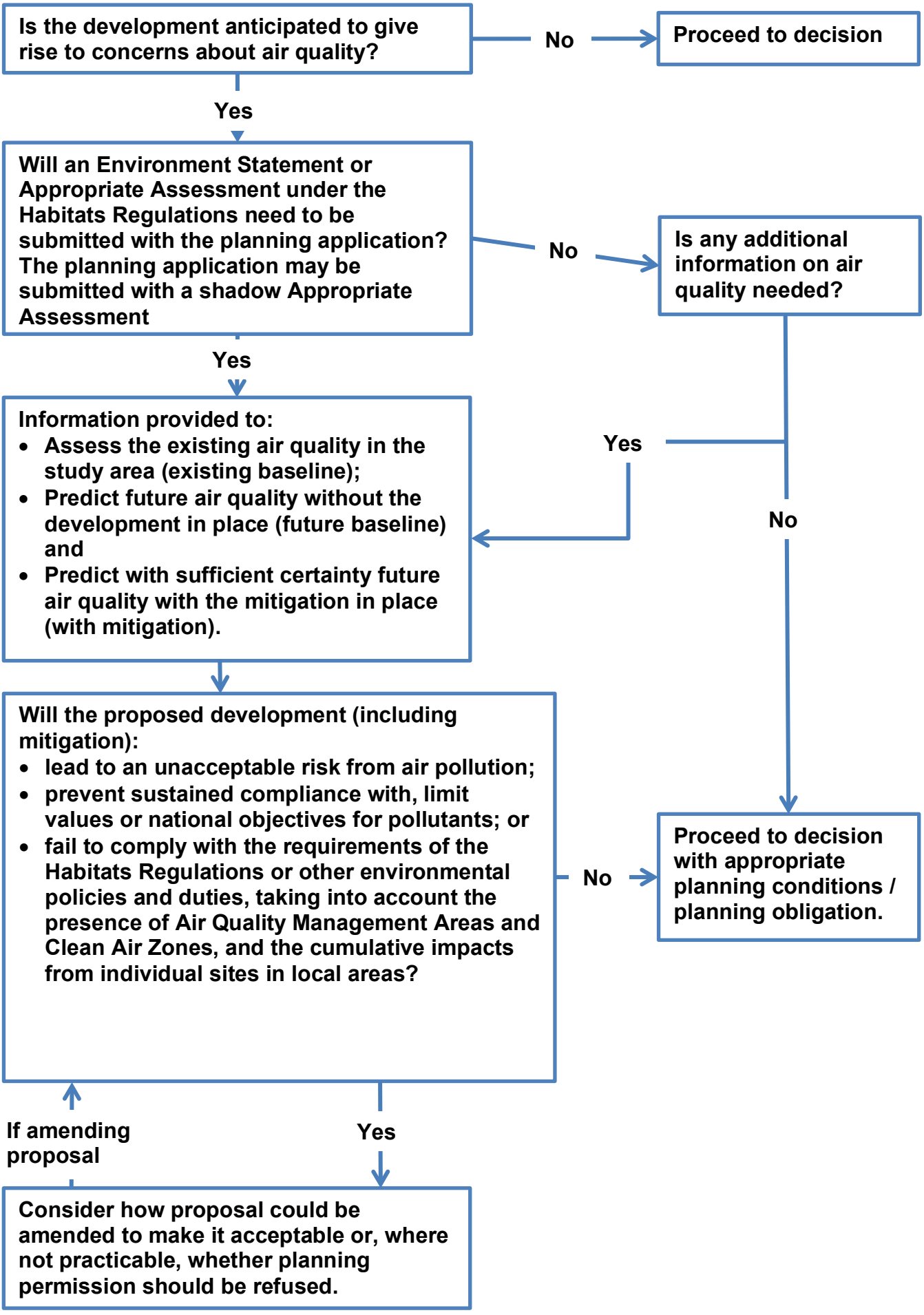
APPENDIX C


Is the development anticipated to give rise to concerns about air quality?
No
Proceed to decision
Yes
Will an Environment Statement or Appropriate Assessment under the Habitats Regulations need to be submitted with the planning application? The planning application may be submitted with a shadow Appropriate Assessment
No
Is any additional information on air quality needed?
Yes
Information provided to:
• Assess the existing air quality in the study area (existing baseline);
• Predict future air quality without the development in place (future baseline) and
• Predict with sufficient certainty future air quality with the mitigation in place (with mitigation).
Yes
No
Will the proposed development (including mitigation):
• lead to an unacceptable risk from air pollution;
• prevent sustained compliance with, limit values or national objectives for pollutants; or
• fail to comply with the requirements of the Habitats Regulations or other environmental policies and duties, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas?
No
Proceed to decision with appropriate planning conditions / planning obligation.
If amending proposal
Yes
Consider how proposal could be amended to make it acceptable or, where not practicable, whether planning permission should be refused.

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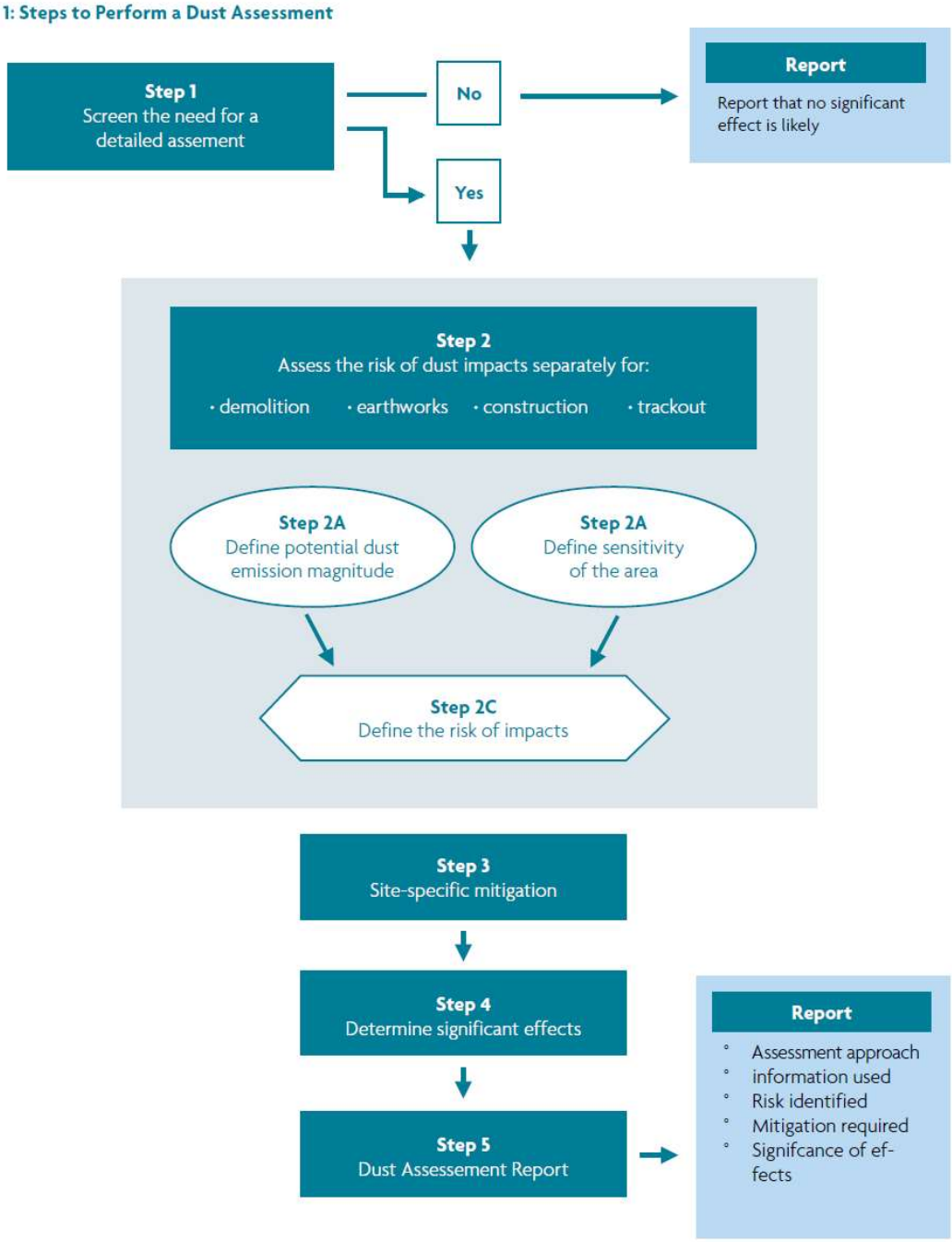
APPENDICES

APPENDIX D

Figure 1: Steps to Perform a Dust Assessment



Demolition
Examples:

- **Large:** Total building volume >75,000m^3, potentially dusty construction material (e.g. contrete), on-site crushing and screening, demolition activates >12m above ground level;
- **Medium:** Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6-12 m above ground level; and
- **Small:** Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities ,6 m above ground, demolition during wetter months.

Earthworks
Examples:

- **Large:** Total site area >110,00 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), > 10 heavy earth moving vehciles active at any one time, formation of bunds .6 in height;
- **Medium:** Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 3m – 6m in height; and
- **Small:** Total site area <18,000 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <3m in height.

Construction
Examples:

- **Large:** Total building volume >75,000 m^3, on site concrete batching sandblasting;
- **Medium:** Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and
- **Small:** Total building volume <12,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)

Trackout
Examples**:**

- **Large**: >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- **Medium**: 20-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road lengths 50m-100m;
- **Small**: <20 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

These numbers are for vehicles that leave the site after moving over unpaved ground, where they will accumulate mud and dirt that can be tracked out onto the public highway.

Sensitivity of the Area to Dust Soiling Effects on People and Property [ab]

Receptor Sensitivity	Number of Receptors	Distance from the Source (m)[c]			
		<20	<50	<100	<250
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Medium	Low	Low	Low
Low	>1	Low	Low	Low	Low

[a] The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout. See **STEP 2B**, **Box 6** and **Box 9.**

[b] Estimate the total number of receptors within the stated distance. Only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptors <20m of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors <50 m is 102. The sensitivity of the area in this case would be high.

[c] For trackout, the distance should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Sensitivity of the Area to Human Health Impacts [ab]

Receptor Sensitivity	Annual Mean PM_{10} concentration[c]	Number of Receptors	Distance from the Source (m)[c]			
			<20	<50	<100	<250
High	>32 µg/m³ (>18 µg/m³ in Scotland)	>100	High	High	High	Low
		10-100	High	High	Medium	Low
		1-10	High	Medium	Low	Low
	28-32 µg/m³ (16-18 µg/m³ in Scotland)	>100	High	High	Medium	Low
		10-100	High	Medium	Low	Low
		1-10	High	Medium	Low	Low
	24-28 µg/m³ (14-16 µg/m³ in Scotland)	>100	High	Medium	Low	Low
		10-100	High	Medium	Low	Low
		1-10	Medium	Low	Low	Low
	<24 µg/m³ (<14 µg/m³ in Scotland)	>100	Medium	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Medium	>32 µg/m³ (>18 µg/m³ in Scotland)	>100	High	Medium	Low	Low
		10-100	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low
	28-32 µg/m³ (16-18 µg/m³ in Scotland)	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	24-28 µg/m³ (14-16 µg/m³ in Scotland)	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
	<24 µg/m³ (<14 µg/m³ in Scotland)	>100	Low	Low	Low	Low
		10-100	Low	Low	Low	Low
		1-10	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low

[a] The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout. See **STEP 2B**, **Box 7** and **Box 9.**

[b] Estimate the total within the stated distance (e.g. the total within 250m and not the number between 100 and 250 m), noting that only the highest level of area sensitivity from the table needs to be considered. For example, if there are 7 high sensitivity receptor <20m of the source and 95 high sensitivity receptors between 20 and 50 m, then the total of number of receptors <50 m is 102. If annual mean PM_{10} concentrations is 29 µg/m³, the sensitivity of the area would be high.

[c] Most straightforwardly taken from the national background maps, but should also take account of local sources. The values are based on 32 µg/m³ being the annual mean concentration at which an exceedance of the 14-hour objective is likely in England, Wales and Northern Ireland. In Scotland there is an annual mean objective of 18µg/m³

[d] In the case of high sensitivity receptors with high occupancy (such as schools or hospitals) approximate the number of people likely to be present. In the case of residential dwellings, just include the number of properties.

[e] For trackout, the distance should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site, and it is only necessary to consider trackout impacts up to 50 m from the edge of the road.

Sensitivity of the Area to Ecological Impacts [ab]

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

[a] The sensitivity of the area should be derived for each of the four activities: demolition, construction, earthworks and trackout and for each designated site. See **STEP 2B**, **Box 8** and **Box 9**.
[b]Only the highest level of area sensitivity from the table needs to be considered.
[c]For trackout, the distances should be measured from the side of the roads used by construction traffic. The impact declines with distance from the site.

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APPENDICES

APPENDIX E

Daniel Newbery

From: Simon Smith <[redacted]>
Sent: 27 November 2024 08:23
To: Daniel Newbery
Subject: RE: Burroughs Road, Ratby

Good Morning

Please use a predicted operational year.

Please note that Blaby have an AQMA in/around Kirby Muxloe please consider an assessment of the impact on AQMA 3 in Blaby - please see Blaby ASR: https://www.blaby.gov.uk/media/eyifhtjp/blaby-district-council-2024-air-quality-annual-status-report.pdf

We have no specific developer guidance.

Regards

Simon Smith
Team Leader – Environmental Protection
Hinckley and Bosworth Borough Council

From: Daniel Newbery <[redacted]>
Sent: 26 November 2024 13:20
To: Giles Rawdon <[redacted]>; Simon Smith <[redacted]>
Subject: RE: Burroughs Road, Ratby

We are proposing to undertake our assessment with reference to the advice provided within the Land-Use Planning and Development Control: Planning for Air Quality, and 'Guidance from Environmental Protection UK', May 2017, and the Institute of Air Quality Management for the consideration of air quality within the land-use planning and development control processes.

We are proposing to undertake dispersion modelling using ADMS roads modelling software.

We are proposing to an assessment for the following scenarios:

- Future year base
- Future year base + committed
- Future year base + committed + development.

The exact years have not yet been confirmed with the transport consultant, would you have any preference for which years for us to undertake?

We would be proposing to use the following links within our assessment; which are also shown on the attached:

- Markfield Road
- Thornton Road
- Groby road
- Main Street
- Sacheverell Way
- Leicester Road
- Markfield Road (west of A46)
- Groby Road (East of A46)

- A46
- Desford Lane
- Station Road

In order to verify our dispersion model we propose to use council monitoring locations:

- 11 – 216 Markfield Road, Groby
- 13 – 36 Groby Road, Ratby
- 10/12/14 – 6 Shaw Lane

We can use DfT traffic count data for locations 11 and 10/12/14.

We will then propose mitigation options such as EV charging, Low NOx Boilers, sustainable travel measures (as discussed in the transport assessment), etc.

Does HBBC have any specific developer guidance that you would like be followed?

Kind regards,

Daniel Newbery BSc(Hons) MIOA MIEnvSc AIAQM
Senior Acoustic & Air Quality Consultant
[redacted]

T: [redacted]
W: m-ec.co.uk

Birmingham | Brighton | Leicester

From: Giles Rawdon <[redacted]>
Sent: 26 November 2024 12:43
To: Daniel Newbery <[redacted]>; Simon Smith <[redacted]>
Subject: RE: Burroughs Road, Ratby

Good afternoon Daniel

Please find attached a PDF copy of the ASR- let me know if you can't open that and I will try another format.

Thanks

Giles Rawdon
Environmental Health Officer
(Environmental Protection)
Tel: [redacted]
Email: [redacted]
Web: www.hinckley-bosworth.gov.uk
Hinckley Hub, Rugby Road, Hinckley, Leics LE10 0FR

From: Daniel Newbery <[redacted]>
Sent: 26 November 2024 12:36
To: Simon Smith <[redacted]>
Cc: Giles Rawdon <[redacted]>
Subject: RE: Burroughs Road, Ratby

Simon,

Thank you for your email.

Would you be able to re send the ASR, as it will not open.

Kind regards,

Daniel Newbery BSc(Hons) MIOA MIEnvSc AIAQM
Senior Acoustic & Air Quality Consultant
[redacted]

T: [redacted]
M: [redacted]
W: m-ec.co.uk

Birmingham | Brighton | Leicester

From: Simon Smith <[redacted]>
Sent: 20 November 2024 10:50
To: Daniel Newbery <[redacted]>
Cc: Giles Rawdon <[redacted]>
Subject: RE: Burroughs Road, Ratby

Good Morning

Please see attached.

The scope of the assessment should be developed using the standard current guidance (LAQM,IAQM) but would essentially be a detailed assessment. Please include pm2.5. Due to the scale of the site an assessment of air quality during the construction phase should also be carried out and mitigation proposed for inclusion in a CEMP for the site.

If you would like to propose a methodology before starting work I am happy to review it.

Regards

Simon Smith
Team Leader – Environmental Protection
Hinckley and Bosworth Borough Council

From: Daniel Newbery <[redacted]>
Sent: 19 November 2024 09:42
To: Giles Rawdon <[redacted]>; Simon Smith <[redacted]>
Subject: Burroughs Road, Ratby
Importance: High

Hello both,

I hope you are well.

We have been commissioned to undertake an air quality assessment for a proposed residential development, at land West of Ratby. A site location plan is attached for reference.

The application is currently live 24/00914/OUT which is for

"Outline planning application (with all four matters reserved apart from access) for a phased mixed-use development comprising about 470 dwellings (Use Class C3) or, in the alternative, about 450 dwellings and care home/extra care facility (Use Class C2/C3). Provision of a community hub (Use Class F2); 1FE primary school (Use Class F1); and associated operations and infrastructure including but not limited to site re-profiling works, sustainable urban drainage system, public open space, landscaping, habitat creation, internal roads/routes, and upgrades to the public highway."

We note that the council have provided comments on the application requesting an air quality assessment to be completed.

We are trying to finalise our study area and methodology, do you have any specific areas you would like to focus our assessment on and what level of assessment would you be after for the assessment?

Would you be able to send through your latest monitoring results and ASR, please?

Thank you for your assistance.

Kind regards,

Daniel Newbery BSc(Hons) MIOA MIEnvSc AIAQM

Senior Acoustic & Air Quality Consultant
[redacted]

T: [redacted]
M: [redacted]
W: m-ec.co.uk

Birmingham | Brighton | Leicester

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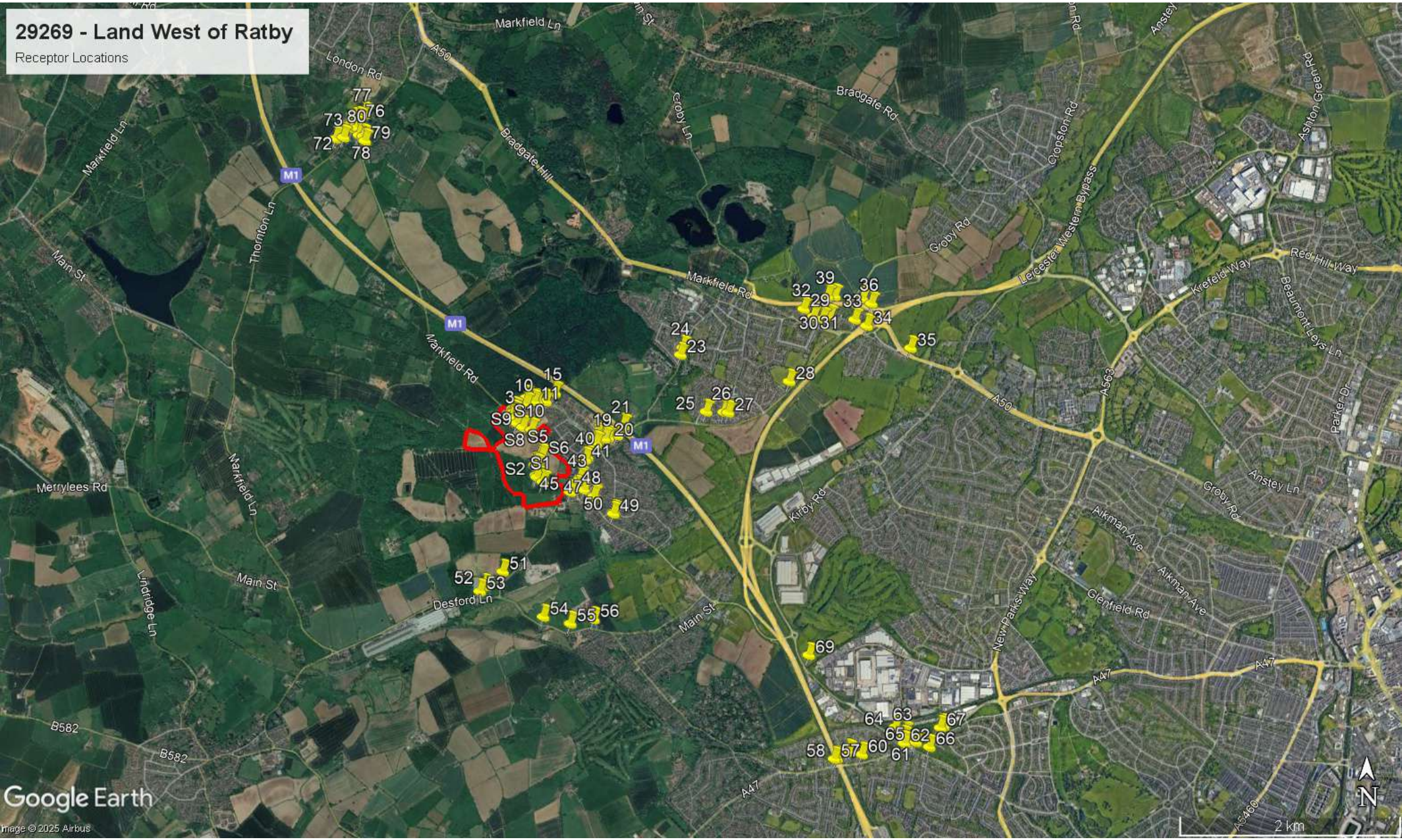
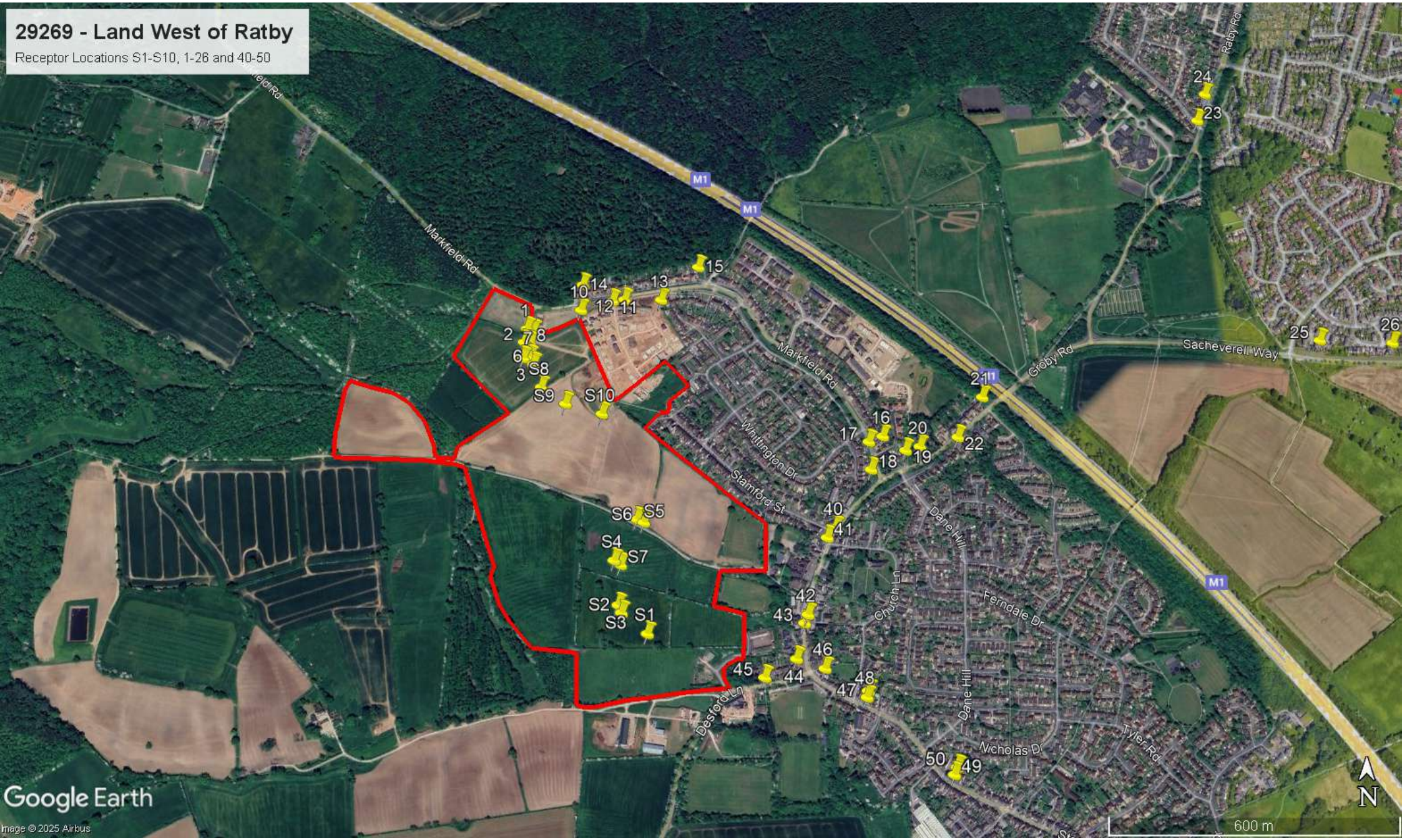
MEC
Consulting Group

APPENDICES

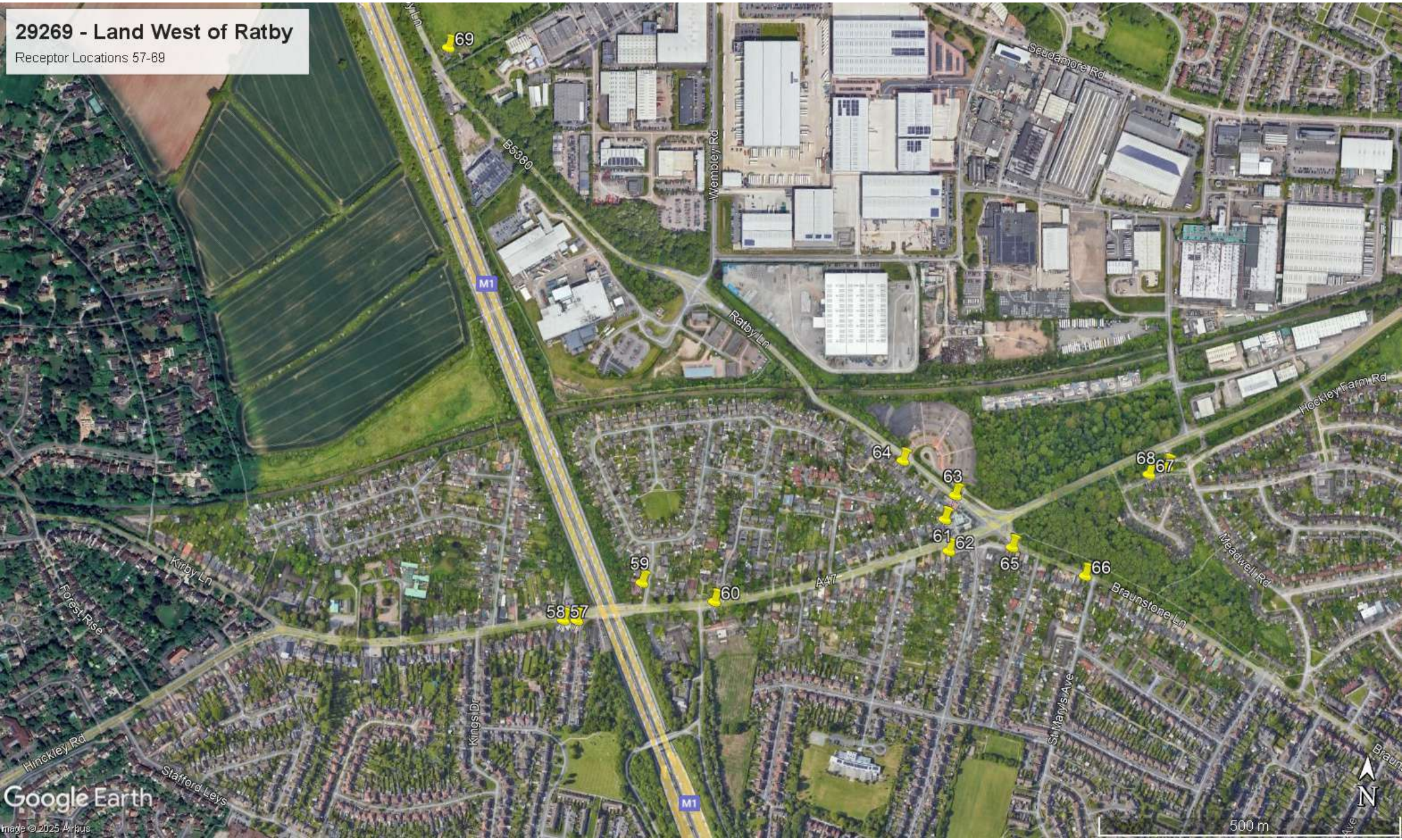
APPENDIX F


29269 - Land West of Ratby
Receptor Locations
Markfield Ln
London Rd
A50
Bradgate Hill
Groby Ln
Bradgate Rd
Cropston Rd
Anstey
Ashton Green Rd
Markfield Ln
M1
Thornton Ln
Main St
Groby Rd
Leicester Western Bypass
Red Hill Way
Krefeld Way
Beaumont Leys Ln
Markfield Rd
A563
Parker Dr
Merrylees Rd
Narkfield Ln
Kirby Rd
Anstey Ln
Groby Rd
Aikman Ave
Lindridge Ln
Main St
Desford Ln
New Parks Way
Glenfield Rd
A47
B582
Google Earth
Image © 2025 Airbus
N
2 km


29269 - Land West of Ratby
Receptor Locations S1-S10, 1-26 and 40-50
M1
Markfield Rd
Groby Rd
Ratby Rd
Sacheverell Way
Whittington Dr
Stamford St
Dane Hill
Church Ln
Ferndale Dr
Nicholas Dr
Tyler Rd
Desford Ln
1
2
3
6
7
8
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
40
41
42
43
44
45
46
47
48
49
50
S1
S2
S3
S4
S5
S6
S7
S8
S9
S10
Google Earth
Image © 2025 Airbus
N
600 m


29269 - Land West of Ratby
Receptor Locations 27-39
Leicester Western Bypass
Leicester Rd
Leicester Rd
Rookery Ln
Pynnm Ley Ln
Crane Ley Rd
Glebe Rd
Marston Dr
Castell Dr
Marlow Dr
Globy Rd
Sacheverell Way
Leicester Western Bypass
Launcton Way
Sacheverell Way
Station Rd
Station Rd
39
38
37
36
32
31
29
30
33
34
35
28
27
Google Earth
Image © 2025 Airbus
500 m
N


29269 - Land West of Ratby
Receptor Locations 51-56
Desford Ln
51
52
53
Desford Ln
54
Desford Ln
55
56
Hedgerow Ln
Google Earth
Image © 2025 Airbus
400 m
N


29269 - Land West of Ratby
Receptor Locations 57-69
69
B5380
Wembley Rd
Soudamore Rd
M1
Ratby Ln
Hinckley Farm Rd
64
63
68
67
61
62
65
66
59
60
58
57
A47
Kirby Ln
Forest Rise
Braunstone Ln
Meadowell Rd
Kings Dr
St Marys Ave
Hinckley Rd
Stafford Leys
Google Earth
Image © 2025 Airbus
500 m
N


29269 - Land West of Ratby
Receptor Locations 70-80
77
75
76
74
71
70
80
73
72
78
79
Thornton Ln
Ratby Ln
Pinewood Ct
Hill Vw
Thornton Ln
Google Earth
Image © 2025 Airbus
N
100 m

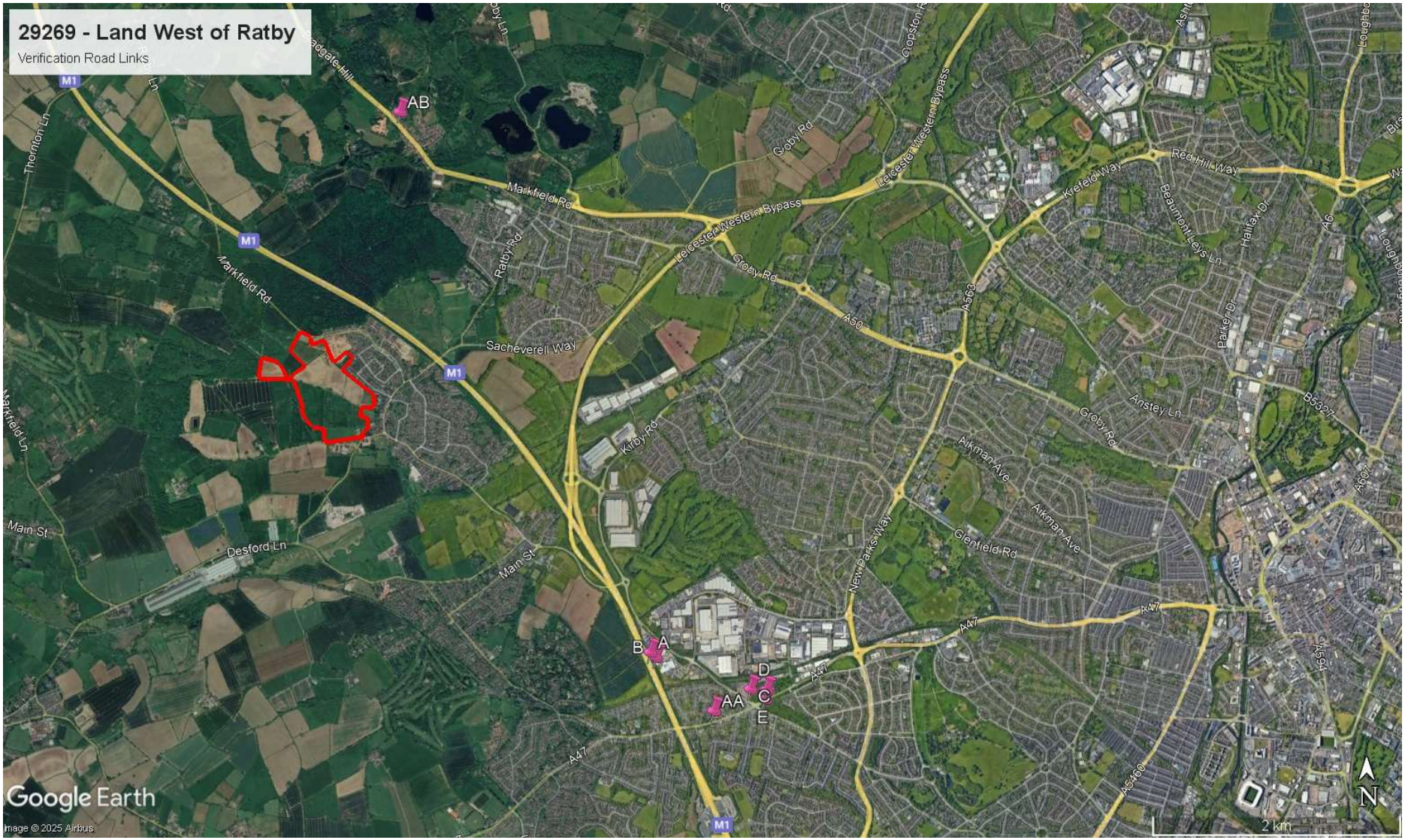
MEC
Consulting Group

APPENDICES

APPENDIX G

2023 Verification

Link ID	Link Name	AADT	LGV	Hourly	%HGV	HGV	Hourly	Speed (Kph)	Link Width (m)
A	M1 NB	100557	78534.8	3272	22%	22022	918	113	15
B	M1 SB	88447	70138.72	2922	21%	18309	763	113	15
AA	A47 - Hinckley Road (west)	18878	17981	749	5%	897	37	10-48	8-16
D	A47 - Hinckley Road (east)	19628	18729	780	5%	899	37	20-60	10-16
C	Ratby Lane	19686	18702	779	5%	984	41	20-45	8-20
E	Braunstone Lane	19686	18702	779	5%	984	41	20-45	8-15
AB	Markfield Road	35110	32662	1361	7%	2448	102	15-60	12-15


29269 - Land West of Ratby
Verification Road Links
M1
Markfield Rd
Thornton Ln
Markfield Ln
Ratby Rd
Groby Rd
Leicester Western Bypass
Sacheverell Way
Kirby Rd
A50
A563
Krefeld Way
Red Hill Way
Beaumont Leys Ln
Halifax Dr
Parker Dr
Anstey Ln
Aikman Ave
New Parks Way
Glenfield Rd
A47
A46
B5327
A594
Main St
Desford Ln
AB
A
B
AA
C
D
E
Google Earth
Image © 2025 Airbus
2 km
N

2028 Do Nothing

Link ID	Link Name	AADT	LGV	Hourly	%HGV	HGV	Hourly	Speed (Kph)	Link Width (m)
A	M1 NB	105270	82216	3426	21.9%	23054	961	113	15
B	M1 SB	92593	73426	3059	20.7%	19167	799	113	15
C	Ratby Lane (N)	20609	18795	783	8.8%	1814	76	20-45	8-20
D	Hinckley Road (E)	20548	19952	831	2.9%	596	25	20-60	10-16
E	Braunstone Lane	20609	19991	833	3.0%	618	26	20-45	8-15
F	Southern Access (Link Road)	0	0	0	0.0%	0	0	0	8
G	A50 Markfield Road (W)	52541	50334	2097	4.2%	2207	92	20-90	20-30
H	A46 Leicester Bypass (N)	105459	100081	4170	5.1%	5378	224	113	20
I	Groby Road (E)	39474	39158	1632	0.8%	316	13	20-85	20-30
J	A46 Leicester Bypass (S)	83071	79665	3319	4.1%	3406	142	113	20
K	Leicester Road (E)	22781	22576	941	0.9%	205	9	20-45	8-20
L	Sacheverell Way	18067	17959	748	0.6%	108	5	20-45	8-15
M	Leicester Road (W)	7263	7183	299	1.1%	80	3	20-45	10-15
N	Groby Road (N)	5066	5010	209	1.1%	56	2	20-45	7-15
O	Groby Road (S)	17730	17659	736	0.4%	71	3	20-45	7-12
P	Markfield Road	6999	6999	292	0.0%	0	0	20-60	6-12
Q	Main Street	15556	15432	643	0.8%	124	5	20-40	6-12
R	Desford Lane	14140	14055	586	0.6%	85	4	20-45	8
S	Station Road	646	643	27	0.5%	3	0	20-45	8
T	Thornton Lane (N)	10946	10858	452	0.8%	88	4	20-45	7
U	Thornton Lane (S)	4888	4888	204	0.0%	0	0	20-45	7
V	Ratby Lane	6340	6308	263	0.5%	32	1	20-45	6-12
W	Northern Access (Link Road)	1136	1136	47	0.0%	0	0	20-40	8
X	Desford Lane (W)	19213	18925	789	1.5%	288	12	20-75	8
Y	Desford Lane (N)	14140	14013	584	0.9%	127	5	20-70	6-15
Z	Desford Lane (E)	9691	9526	397	1.7%	165	7	20-75	7
AA	Hinckley Road (W)	20443	19748	823	3.4%	695	29	10-48	8-16

2028 Do Something

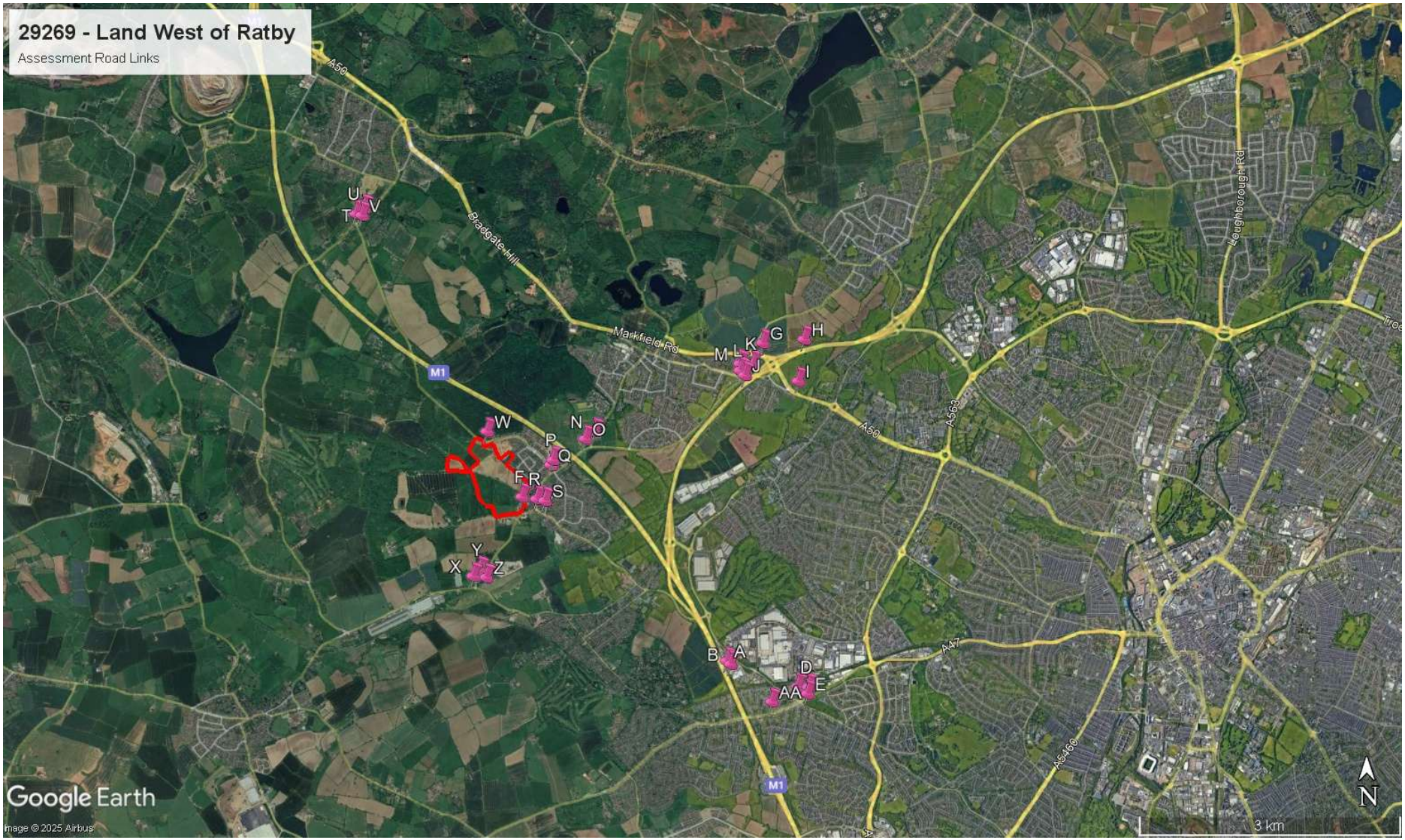
Link ID	Link Name	AADT	LGV	Hourly	%HGV	HGV	Hourly	Speed (Kph)	Link Width (m)
A	M1 NB	105271	82217	3426	21.9%	23054	961	113	15
B	M1 SB	92619	73447	3060	20.7%	19172	799	113	15
C	Ratby Lane (N)	20679	18859	786	8.8%	1820	76	20-45	8-20
D	Hinckley Road (E)	20583	19986	833	2.9%	597	25	20-60	10-16
E	Braunstone Lane	20644	20025	834	3.0%	619	26	20-45	8-15
F	Southern Access (Link Road)	1692	1692	71	0.0%	0	0	0	8
G	A50 Markfield Road (W)	52610	50400	2100	4.2%	2210	92	20-90	20-30
H	A46 Leicester Bypass (N)	105871	100472	4186	5.1%	5399	225	113	20
I	Groby Road (E)	39576	39259	1636	0.8%	317	13	20-85	20-30
J	A46 Leicester Bypass (S)	83236	79823	3326	4.1%	3413	142	113	20
K	Leicester Road (E)	22975	22768	949	0.9%	207	9	20-45	8-20
L	Sacheverell Way	18308	18198	758	0.6%	110	5	20-45	8-15
M	Leicester Road (W)	7305	7225	301	1.1%	80	3	20-45	10-15
N	Groby Road (N)	5337	5278	220	1.1%	59	2	20-45	7-15
O	Groby Road (S)	18362	18289	762	0.4%	73	3	20-45	7-12
P	Markfield Road	7354	7354	306	0.0%	0	0	20-60	6-12
Q	Main Street	16241	16111	671	0.8%	130	5	20-40	6-12
R	Desford Lane	15048	14958	623	0.6%	90	4	20-45	8
S	Station Road	869	865	36	0.5%	4	0	20-45	8
T	Thornton Lane (N)	11170	11081	462	0.8%	89	4	20-45	7
U	Thornton Lane (S)	4903	4903	204	0.0%	0	0	20-45	7
V	Ratby Lane	6487	6455	269	0.5%	32	1	20-45	6-12
W	Northern Access (Link Road)	1565	1565	65	0.0%	0	0	20-40	8
X	Desford Lane (W)	19280	18991	791	1.5%	289	12	20-75	8
Y	Desford Lane (N)	13873	13748	573	0.9%	125	5	20-70	6-15
Z	Desford Lane (E)	10060	9889	412	1.7%	171	7	20-75	7
AA	Hinckley Road (W)	20443	19748	823	3.4%	695	29	10-48	8-16

2031 Do Nothing

Link ID	Link Name	AADT	LGV	Hourly	%HGV	HGV	Hourly	Speed (Kph)	Link Width (m)
A	M1 NB	107715	84125	3505	21.9%	23590	983	113	15
B	M1 SB	96296	76363	3182	20.7%	19933	831	113	15
C	Ratby Lane (N)	21967	20034	835	8.8%	1933	81	20-45	8-20
D	Hinckley Road (E)	21254	20638	860	2.9%	616	26	20-60	10-16
E	Braunstone Lane	21967	21308	888	3.0%	659	27	20-45	8-15
F	Southern Access (Link Road)	0	0	0	0.0%	0	0	0	8
G	A50 Markfield Road (W)	53193	50959	2123	4.2%	2234	93	20-90	20-30
H	A46 Leicester Bypass (N)	107909	102406	4267	5.1%	5503	229	113	20
I	Groby Road (E)	40929	40602	1692	0.8%	327	14	20-85	20-30
J	A46 Leicester Bypass (S)	85560	82052	3419	4.1%	3508	146	113	20
K	Leicester Road (E)	23222	23013	959	0.9%	209	9	20-45	8-20
L	Sacheverell Way	18310	18200	758	0.6%	110	5	20-45	8-15
M	Leicester Road (W)	7668	7584	316	1.1%	84	4	20-45	10-15
N	Groby Road (N)	5507	5446	227	1.1%	61	3	20-45	7-15
O	Groby Road (S)	19087	19011	792	0.4%	76	3	20-45	7-12
P	Markfield Road	7643	7643	318	0.0%	0	0	20-60	6-12
Q	Main Street	16875	16740	698	0.8%	135	6	20-40	6-12
R	Desford Lane	15518	15425	643	0.6%	93	4	20-45	8
S	Station Road	674	671	28	0.5%	3	0	20-45	8
T	Thornton Lane (N)	12163	12066	503	0.8%	97	4	20-45	7
U	Thornton Lane (S)	5413	5413	226	0.0%	0	0	20-45	7
V	Ratby Lane	6997	6962	290	0.5%	35	1	20-45	6-12
W	Northern Access (Link Road)	1136	1136	47	0.0%	0	0	20-40	8
X	Desford Lane (W)	21136	20819	867	1.5%	317	13	20-75	8
Y	Desford Lane (N)	15518	15378	641	0.9%	140	6	20-70	6-15
Z	Desford Lane (E)	11294	11102	463	1.7%	192	8	20-75	7
AA	Hinckley Road (W)	21145	20426	851	3.4%	719	30	10-48	8-16

2031 Do Something

Link ID	Link Name	AADT	LGV	Hourly	%HGV	HGV	Hourly	Speed (Kph)	Link Width (m)
A	M1 NB	107699	84113	3505	21.9%	23586	983	113	15
B	M1 SB	96217	76300	3179	20.7%	19917	830	113	15
C	Ratby Lane (N)	22048	20108	838	8.8%	1940	81	20-45	8-20
D	Hinckley Road (E)	21295	20677	862	2.9%	618	26	20-60	10-16
E	Braunstone Lane	22007	21347	889	3.0%	660	28	20-45	8-15
F	Southern Access (Link Road)	3517	3517	147	0.0%	0	0	0	8
G	A50 Markfield Road (W)	53429	51185	2133	4.2%	2244	94	20-90	20-30
H	A46 Leicester Bypass (N)	108620	103080	4295	5.1%	5540	231	113	20
I	Groby Road (E)	41298	40968	1707	0.8%	330	14	20-85	20-30
J	A46 Leicester Bypass (S)	85952	82428	3434	4.1%	3524	147	113	20
K	Leicester Road (E)	23953	23737	989	0.9%	216	9	20-45	8-20
L	Sacheverell Way	19267	19151	798	0.6%	116	5	20-45	8-15
M	Leicester Road (W)	7849	7763	323	1.1%	86	4	20-45	10-15
N	Groby Road (N)	6322	6252	261	1.1%	70	3	20-45	7-15
O	Groby Road (S)	20538	20456	852	0.4%	82	3	20-45	7-12
P	Markfield Road	7158	7158	298	0.0%	0	0	20-60	6-12
Q	Main Street	14901	14782	616	0.8%	119	5	20-40	6-12
R	Desford Lane	14155	14070	586	0.6%	85	4	20-45	8
S	Station Road	1547	1539	64	0.5%	8	0	20-45	8
T	Thornton Lane (N)	12935	12832	535	0.8%	103	4	20-45	7
U	Thornton Lane (S)	5286	5286	220	0.0%	0	0	20-45	7
V	Ratby Lane	7849	7810	325	0.5%	39	2	20-45	6-12
W	Northern Access (Link Road)	6029	6029	251	0.0%	0	0	20-40	8
X	Desford Lane (W)	21375	21054	877	1.5%	321	13	20-75	8
Y	Desford Lane (N)	15973	15829	660	0.9%	144	6	20-70	6-15
Z	Desford Lane (E)	12324	12114	505	1.7%	210	9	20-75	7
AA	Hinckley Road (W)	21145	20426	851	3.4%	719	30	10-48	8-16


29269 - Land West of Ratby
Assessment Road Links
A50
Bradgate Hill
Markfield Rd
M1
A563
A47
A5460
Loughborough Rd
U
T
V
W
N
O
P
Q
F
R
S
Y
X
Z
G
H
K
L
M
J
I
B
A
D
E
AA
Google Earth
Image © 2025 Airbus
3 km
N

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Consulting Group

APPENDICES

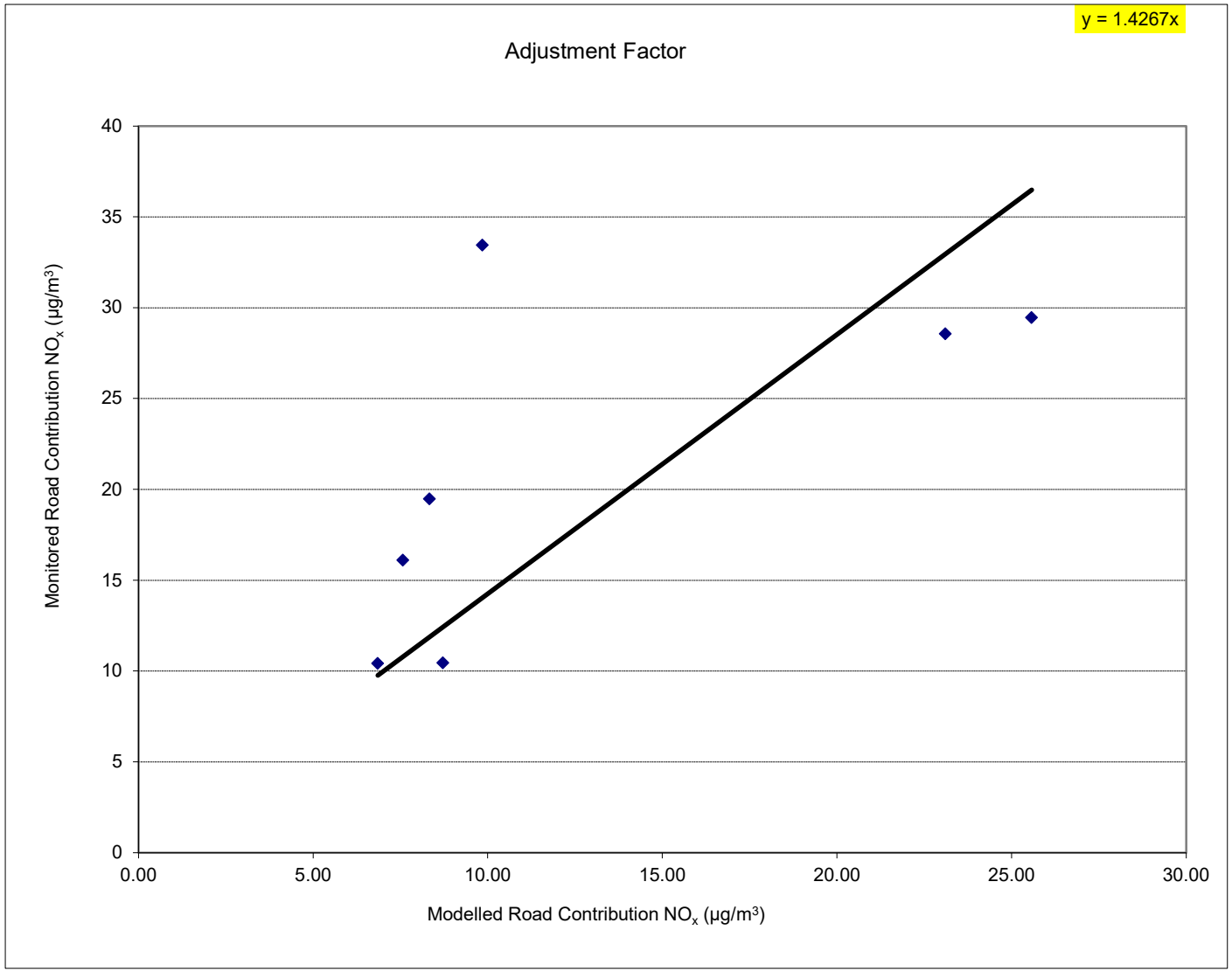
APPENDIX H

Verification (LAQM.TG 22)

	453500, 304500	452500, 302500	453500, 303500	454500, 303500	451500, 308500
Background NO_2	11.60	9.11	11.10	11.56	9.44
Background NO_x	15.30	11.80	14.55	15.70	12.27

Site ID	Location		Modelled Road Contribution NO_x (ex-background)	Monitored Total NO_2	Monitored Road Contribution Nox*	Monitored Total NO_x	Ratio of Monitored Road Contribution NO_x / Modelled Road Contribution NO_x
	X (m)	Y (m)					
16	453216	304275	25.57	24.4	29.45	44.8	1.2
54	453591	303420	23.10	23.6	28.56	43.1	1.2
56	454079	303535	6.85	16.4	10.42	26.1	1.5
57	454090	303600	9.84	25.9	33.44	49.1	3.4
93	453140	303311	8.33	19.9	19.48	34.0	2.3
CM4	454020	303473	7.57	18.9	16.11	31.8	2.1
11	451376	308147	8.72	17.1	10.45	22.7	1.2

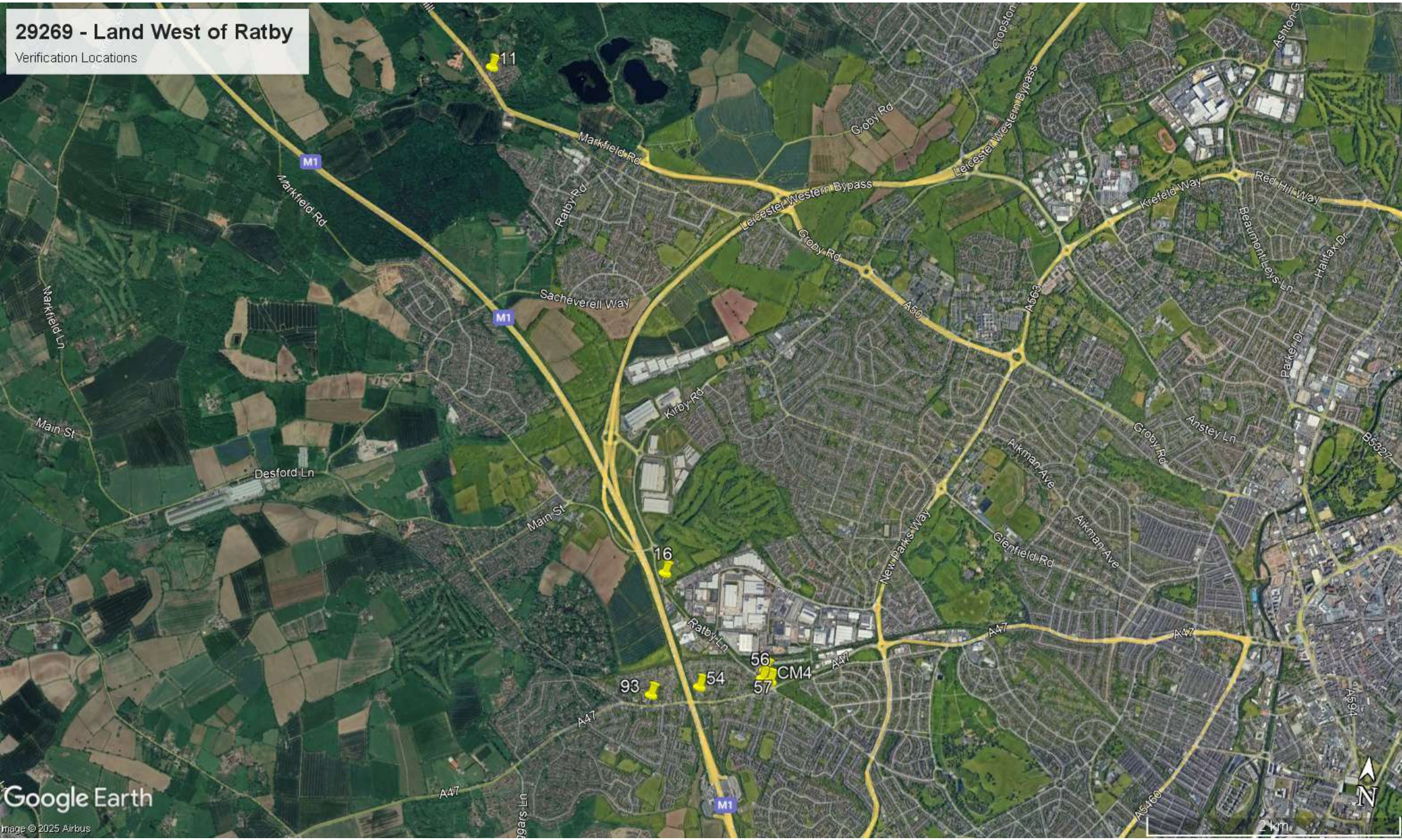
Verification Factor	1.4


y = 1.4267x
Adjustment Factor
Monitored Road Contribution NOx (µg/m3)
Modelled Road Contribution NOx (µg/m3)
0
5
10
15
20
25
30
35
40
0.00
5.00
10.00
15.00
20.00
25.00
30.00

Root Mean Square Error (RMSE)

$$RMSE = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(Obs_i - Pred_i)^2}$$

Name	Observations	Predictions	Observations – Predictions	Squared	Total	Average	RMSE	%
16	24.4	27.07	-2.67	7.13	89.54	12.8	3.6	9%
54	23.6	25.3	-1.7	2.89				
56	16.4	16.11	0.29	0.08				
57	25.9	18	7.9	62.41				
93	19.9	16.61	3.29	10.82				
CM4	18.9	16.57	2.33	5.43				
11	17.1	17.98	-0.88	0.77				


29269 - Land West of Ratby
Verification Locations
11
16
93
54
56
57
CM4
M1
A47
A50
A563
A5460
A594
B5327
Markfield Rd
Ratby Rd
Groby Rd
Leicester Western Bypass
Sacheverell Way
Kirby Rd
Ratby Ln
New Parks Way
Aikman Ave
Glenfield Rd
Krefeld Way
Red Hill Way
Beaumont Leys Ln
Halifax Dr
Parker Dr
Anstey Ln
Markfield Ln
Main St
Desford Ln
Google Earth
Image © 2025 Airbus
2km
N

MEC
Consulting Group

APPENDICES

APPENDIX I

2028 NO_2										
Receptor Name	X(m)	Y(m)	Z(m)	2028 DN	2028 DS	DS-DN	% Change	AQAL	AQAL	Impact Descriptor
S1	450815.6	305792.1	1.5	7.26	7.48	0.22	1%	18%	19%	Negligible
S2	450759.9	305835	1.5	7.22	7.55	0.33	1%	18%	19%	Negligible
S3	450752.5	305850.7	1.5	7.21	7.56	0.35	1%	18%	19%	Negligible
S4	450741.4	305944.2	1.5	7.19	7.46	0.27	1%	18%	19%	Negligible
S5	450787.9	306032.1	1.5	7.19	7.48	0.29	1%	18%	19%	Negligible
S6	450803	306026	1.5	7.19	7.52	0.33	1%	18%	19%	Negligible
S7	450755.7	305935.2	1.5	7.19	7.54	0.35	1%	18%	19%	Negligible
S8	450572.9	306317.1	1.5	7.25	7.42	0.17	0%	18%	19%	Negligible
S9	450627	306281.4	1.5	7.19	7.43	0.24	1%	18%	19%	Negligible
S10	450706.8	306260	1.5	7.2	7.48	0.28	1%	18%	19%	Negligible
1	450537.3	306448	1.5	7.4	7.48	0.08	0%	19%	19%	Negligible
2	450531.7	306417.3	1.5	7.38	7.47	0.09	0%	18%	19%	Negligible
3	450530.9	306381.6	1.5	7.35	7.43	0.08	0%	18%	19%	Negligible
4	450559	306339.5	1.5	7.34	7.43	0.09	0%	18%	19%	Negligible
5	450572.2	306345.6	1.5	7.41	7.54	0.13	0%	19%	19%	Negligible
6	450553.9	306371.8	1.5	7.44	7.55	0.11	0%	19%	19%	Negligible
7	450546	306384.8	1.5	7.42	7.53	0.11	0%	19%	19%	Negligible
8	450544.7	306415.2	1.5	7.47	7.58	0.11	0%	19%	19%	Negligible
9	450550.8	306443	1.5	7.47	7.58	0.11	0%	19%	19%	Negligible
10	450654.2	306491.7	1.5	7.44	7.48	0.04	0%	19%	19%	Negligible
11	450723.3	306513.3	1.5	7.55	7.59	0.04	0%	19%	19%	Negligible
12	450749.8	306516.5	1.5	7.53	7.57	0.04	0%	19%	19%	Negligible
13	450830.7	306517.3	1.5	7.44	7.47	0.03	0%	19%	19%	Negligible
14	450657	306549	1.5	7.73	7.78	0.05	0%	19%	19%	Negligible
15	450912	306593	1.5	7.85	7.89	0.04	0%	20%	20%	Negligible
16	451316	306219	1.5	8.75	8.81	0.06	0%	22%	22%	Negligible
17	451286	306207	1.5	8.62	8.67	0.05	0%	22%	22%	Negligible
18	451290	306146	1.5	9.31	9.39	0.08	0%	23%	23%	Negligible
19	451365	306189	1.5	9.54	9.62	0.08	0%	24%	24%	Negligible
20	451396	306198	1.5	9.9	9.99	0.09	0%	25%	25%	Negligible
21	451534	306308	1.5	9.58	9.65	0.07	0%	24%	24%	Negligible
22	451479	306219	1.5	9.17	9.23	0.06	0%	23%	23%	Negligible
23	452040	306954	1.5	8.95	8.99	0.04	0%	22%	22%	Negligible
24	452061	307018	1.5	8.9	8.93	0.03	0%	22%	22%	Negligible
25	452279	306445	1.5	10.32	10.35	0.03	0%	26%	26%	Negligible
26	452438	306441	1.5	10.38	10.4	0.02	0%	26%	26%	Negligible
27	452477	306439	1.5	10.64	10.67	0.03	0%	27%	27%	Negligible
28	453023	306727	1.5	14.94	14.99	0.05	0%	37%	37%	Negligible
29	453316	307292	1.5	10.19	10.2	0.01	0%	25%	26%	Negligible
30	453379	307313	1.5	10.55	10.56	0.01	0%	26%	26%	Negligible
31	453234	307312	1.5	9.8	9.81	0.01	0%	25%	25%	Negligible
32	453145	307380	1.5	9.89	9.9	0.01	0%	25%	25%	Negligible
33	453607	307290	1.5	15.64	15.67	0.03	0%	39%	39%	Negligible
34	453716	307235	1.5	13.26	13.28	0.02	0%	33%	33%	Negligible
35	454113	307041	1.5	10.53	10.54	0.01	0%	26%	26%	Negligible
36	453755	307437	1.5	13.07	13.09	0.02	0%	33%	33%	Negligible
37	453675	307480	1.5	12.45	12.46	0.01	0%	31%	31%	Negligible

2028 NO_2										
Receptor Name	**X(m)**	**Y(m)**	**Z(m)**	**2028 DN**	**2028 DS**	**DS-DN**	**% Change**	**AQAL**	**AQAL**	**Impact Descriptor**
38	453422	307499	1.5	11.43	11.44	0.01	0%	29%	29%	Negligible
39	453358	307496	1.5	11.14	11.14	0.00	0%	28%	28%	Negligible
40	451212	306020	1.5	12.33	12.53	0.20	0%	31%	31%	Negligible
41	451195	305999	1.5	12.15	12.33	0.18	0%	30%	31%	Negligible
42	451154	305836	4	9.29	9.37	0.08	0%	23%	23%	Negligible
43	451146	305819	4	9.07	9.15	0.08	0%	23%	23%	Negligible
44	451129	305745	1.5	9.6	9.72	0.12	0%	24%	24%	Negligible
45	451063	305706	1.5	11.3	11.56	0.26	1%	28%	29%	Negligible
46	451189	305726	4	8.44	8.5	0.06	0%	21%	21%	Negligible
47	451279	305681	1.5	8.09	8.14	0.05	0%	20%	20%	Negligible
48	451276	305668	4	7.99	8.02	0.03	0%	20%	20%	Negligible
49	451455	305515	1.5	7.96	8	0.04	0%	20%	20%	Negligible
50	451461	305530	1.5	7.99	8.03	0.04	0%	20%	20%	Negligible
51	450465	304982	1.5	8.2	8.19	-0.01	0%	21%	20%	Negligible
52	450303	304850	1.5	9.26	9.27	0.01	0%	23%	23%	Negligible
53	450261	304802	1.5	8.06	8.06	0.00	0%	20%	20%	Negligible
54	450835	304580	1.5	7.63	7.66	0.03	0%	19%	19%	Negligible
55	451080	304523	1.5	8.6	8.64	0.04	0%	22%	22%	Negligible
56	451289	304564	1.5	8.47	8.5	0.03	0%	21%	21%	Negligible
57	453475	303338	1.5	16.6	16.6	0.00	0%	42%	42%	Negligible
58	453497	303338	1.5	17.67	17.68	0.01	0%	44%	44%	Negligible
59	453601	303406	1.5	21.58	21.58	0.00	0%	54%	54%	Negligible
60	453722	303382	1.5	16.13	16.13	0.00	0%	40%	40%	Negligible
61	454094	303538	1.5	13.99	13.99	0.00	0%	35%	35%	Negligible
62	454104	303486	1.5	12.79	12.79	0.00	0%	32%	32%	Negligible
63	454109	303578	1.5	14.32	14.33	0.01	0%	36%	36%	Negligible
64	454020	303631	1.5	13.21	13.22	0.01	0%	33%	33%	Negligible
65	454208	303498	1.5	12.6	12.6	0.00	0%	32%	32%	Negligible
66	454331	303458	1.5	11.89	11.89	0.00	0%	30%	30%	Negligible
67	454426	303631	1.5	11.22	11.23	0.01	0%	28%	28%	Negligible
68	454455	303645	1.5	11.14	11.14	0.00	0%	28%	28%	Negligible
69	453233	304268	1.5	20.27	20.28	0.01	0%	51%	51%	Negligible

2028 PM_{10}										
Receptor Name	X(m)	Y(m)	Z(m)	2028 DN	2028 DS	DS-DN	% Change	AQAL	AQAL	Impact Descriptor
S1	450815.6	305792.1	1.5	12.33	12.42	0.08	0%	31%	31%	Negligible
S2	450759.9	305835	1.5	12.32	12.45	0.13	0%	31%	31%	Negligible
S3	450752.5	305850.7	1.5	12.31	12.46	0.14	0%	31%	31%	Negligible
S4	450741.4	305944.2	1.5	12.31	12.42	0.11	0%	31%	31%	Negligible
S5	450787.9	306032.1	1.5	12.31	12.42	0.11	0%	31%	31%	Negligible
S6	450803	306026	1.5	12.31	12.44	0.13	0%	31%	31%	Negligible
S7	450755.7	305935.2	1.5	12.31	12.45	0.14	0%	31%	31%	Negligible
S8	450572.9	306317.1	1.5	14.01	14.08	0.07	0%	35%	35%	Negligible
S9	450627	306281.4	1.5	13.99	14.09	0.10	0%	35%	35%	Negligible
S10	450706.8	306260	1.5	13.99	14.10	0.11	0%	35%	35%	Negligible
1	450537.3	306448	1.5	14.07	14.11	0.03	0%	35%	35%	Negligible
2	450531.7	306417.3	1.5	14.07	14.10	0.03	0%	35%	35%	Negligible
3	450530.9	306381.6	1.5	14.06	14.09	0.03	0%	35%	35%	Negligible
4	450559	306339.5	1.5	14.05	14.09	0.04	0%	35%	35%	Negligible
5	450572.2	306345.6	1.5	14.08	14.13	0.05	0%	35%	35%	Negligible
6	450553.9	306371.8	1.5	14.09	14.14	0.05	0%	35%	35%	Negligible
7	450546	306384.8	1.5	14.08	14.13	0.04	0%	35%	35%	Negligible
8	450544.7	306415.2	1.5	14.10	14.15	0.05	0%	35%	35%	Negligible
9	450550.8	306443	1.5	14.10	14.15	0.04	0%	35%	35%	Negligible
10	450654.2	306491.7	1.5	14.09	14.10	0.01	0%	35%	35%	Negligible
11	450723.3	306513.3	1.5	14.14	14.15	0.01	0%	35%	35%	Negligible
12	450749.8	306516.5	1.5	14.13	14.14	0.01	0%	35%	35%	Negligible
13	450830.7	306517.3	1.5	14.09	14.10	0.01	0%	35%	35%	Negligible
14	450657	306549	1.5	14.21	14.23	0.02	0%	36%	36%	Negligible
15	450912	306593	1.5	14.25	14.27	0.02	0%	36%	36%	Negligible
16	451316	306219	1.5	15.26	15.29	0.02	0%	38%	38%	Negligible
17	451286	306207	1.5	15.21	15.23	0.02	0%	38%	38%	Negligible
18	451290	306146	1.5	15.45	15.48	0.03	0%	39%	39%	Negligible
19	451365	306189	1.5	15.57	15.60	0.03	0%	39%	39%	Negligible
20	451396	306198	1.5	15.73	15.77	0.04	0%	39%	39%	Negligible
21	451534	306308	1.5	15.61	15.64	0.03	0%	39%	39%	Negligible
22	451479	306219	1.5	15.44	15.46	0.02	0%	39%	39%	Negligible
23	452040	306954	1.5	14.54	14.56	0.01	0%	36%	36%	Negligible
24	452061	307018	1.5	14.27	14.29	0.01	0%	36%	36%	Negligible
25	452279	306445	1.5	15.06	15.07	0.01	0%	38%	38%	Negligible
26	452438	306441	1.5	15.04	15.05	0.01	0%	38%	38%	Negligible
27	452477	306439	1.5	15.14	15.15	0.01	0%	38%	38%	Negligible
28	453023	306727	1.5	15.05	15.07	0.02	0%	38%	38%	Negligible
29	453316	307292	1.5	15.90	15.91	0.00	0%	40%	40%	Negligible
30	453379	307313	1.5	16.00	16.01	0.00	0%	40%	40%	Negligible
31	453234	307312	1.5	15.81	15.81	0.00	0%	40%	40%	Negligible
32	453145	307380	1.5	15.89	15.89	0.00	0%	40%	40%	Negligible
33	453607	307290	1.5	17.22	17.23	0.01	0%	43%	43%	Negligible
34	453716	307235	1.5	16.55	16.55	0.01	0%	41%	41%	Negligible
35	454113	307041	1.5	15.29	15.29	0.00	0%	38%	38%	Negligible
36	453755	307437	1.5	16.44	16.45	0.00	0%	41%	41%	Negligible
37	453675	307480	1.5	16.31	16.32	0.00	0%	41%	41%	Negligible

2028 PM_{10}										
Receptor Name	**X(m)**	**Y(m)**	**Z(m)**	**2028 DN**	**2028 DS**	**DS-DN**	**% Change**	**AQAL**	**AQAL**	**Impact Descriptor**
38	453422	307499	1.5	16.10	16.10	0.00	0%	40%	40%	Negligible
39	453358	307496	1.5	16.03	16.03	0.00	0%	40%	40%	Negligible
40	451212	306020	1.5	16.78	16.87	0.09	0%	42%	42%	Negligible
41	451195	305999	1.5	15.02	15.10	0.08	0%	38%	38%	Negligible
42	451154	305836	4	13.81	13.84	0.03	0%	35%	35%	Negligible
43	451146	305819	4	13.72	13.74	0.03	0%	34%	34%	Negligible
44	451129	305745	1.5	13.89	13.93	0.04	0%	35%	35%	Negligible
45	451063	305706	1.5	14.64	14.73	0.09	0%	37%	37%	Negligible
46	451189	305726	4	13.44	13.46	0.02	0%	34%	34%	Negligible
47	451279	305681	1.5	13.32	13.34	0.02	0%	33%	33%	Negligible
48	451276	305668	4	13.28	13.29	0.01	0%	33%	33%	Negligible
49	451455	305515	1.5	13.27	13.28	0.01	0%	33%	33%	Negligible
50	451461	305530	1.5	13.28	13.29	0.02	0%	33%	33%	Negligible
51	450465	304982	1.5	14.17	14.17	0.00	0%	35%	35%	Negligible
52	450303	304850	1.5	14.46	14.47	0.00	0%	36%	36%	Negligible
53	450261	304802	1.5	14.11	14.11	0.00	0%	35%	35%	Negligible
54	450835	304580	1.5	13.99	13.99	0.01	0%	35%	35%	Negligible
55	451080	304523	1.5	13.25	13.27	0.01	0%	33%	33%	Negligible
56	451289	304564	1.5	13.21	13.23	0.01	0%	33%	33%	Negligible
57	453475	303338	1.5	17.27	17.27	0.00	0%	43%	43%	Negligible
58	453497	303338	1.5	17.47	17.47	0.00	0%	44%	44%	Negligible
59	453601	303406	1.5	18.49	18.49	0.00	0%	46%	46%	Negligible
60	453722	303382	1.5	17.33	17.33	0.00	0%	43%	43%	Negligible
61	454094	303538	1.5	16.35	16.35	0.00	0%	41%	41%	Negligible
62	454104	303486	1.5	15.98	15.98	0.00	0%	40%	40%	Negligible
63	454109	303578	1.5	16.55	16.56	0.00	0%	41%	41%	Negligible
64	454020	303631	1.5	16.18	16.18	0.00	0%	40%	40%	Negligible
65	454208	303498	1.5	16.02	16.02	0.00	0%	40%	40%	Negligible
66	454331	303458	1.5	15.86	15.86	0.00	0%	40%	40%	Negligible
67	454426	303631	1.5	15.58	15.58	0.00	0%	39%	39%	Negligible
68	454455	303645	1.5	15.55	15.55	0.00	0%	39%	39%	Negligible
69	453233	304268	1.5	18.58	18.59	0.00	0%	46%	46%	Negligible

2028 $PM_{2.5}$										
Receptor Name	X(m)	Y(m)	Z(m)	2028 DN	2028 DS	DS-DN	% Change	AQAL	AQAL	Impact Descriptor
S1	450815.6	305792.1	1.5	6.82	6.86	0.04	0%	57%	57%	Negligible
S2	450759.9	305835	1.5	6.81	6.88	0.07	1%	57%	57%	Negligible
S3	450752.5	305850.7	1.5	6.81	6.88	0.07	1%	57%	57%	Negligible
S4	450741.4	305944.2	1.5	6.81	6.86	0.06	0%	57%	57%	Negligible
S5	450787.9	306032.1	1.5	6.81	6.87	0.06	0%	57%	57%	Negligible
S6	450803	306026	1.5	6.81	6.88	0.07	1%	57%	57%	Negligible
S7	450755.7	305935.2	1.5	6.81	6.88	0.07	1%	57%	57%	Negligible
S8	450572.9	306317.1	1.5	7.13	7.17	0.03	0%	59%	60%	Negligible
S9	450627	306281.4	1.5	7.12	7.17	0.05	0%	59%	60%	Negligible
S10	450706.8	306260	1.5	7.12	7.18	0.06	0%	59%	60%	Negligible
1	450537.3	306448	1.5	7.16	7.18	0.02	0%	60%	60%	Negligible
2	450531.7	306417.3	1.5	7.16	7.18	0.02	0%	60%	60%	Negligible
3	450530.9	306381.6	1.5	7.15	7.17	0.02	0%	60%	60%	Negligible
4	450559	306339.5	1.5	7.15	7.17	0.02	0%	60%	60%	Negligible
5	450572.2	306345.6	1.5	7.17	7.19	0.03	0%	60%	60%	Negligible
6	450553.9	306371.8	1.5	7.17	7.20	0.02	0%	60%	60%	Negligible
7	450546	306384.8	1.5	7.17	7.19	0.02	0%	60%	60%	Negligible
8	450544.7	306415.2	1.5	7.18	7.20	0.02	0%	60%	60%	Negligible
9	450550.8	306443	1.5	7.18	7.20	0.02	0%	60%	60%	Negligible
10	450654.2	306491.7	1.5	7.17	7.18	0.01	0%	60%	60%	Negligible
11	450723.3	306513.3	1.5	7.20	7.20	0.01	0%	60%	60%	Negligible
12	450749.8	306516.5	1.5	7.19	7.20	0.01	0%	60%	60%	Negligible
13	450830.7	306517.3	1.5	7.17	7.18	0.01	0%	60%	60%	Negligible
14	450657	306549	1.5	7.23	7.24	0.01	0%	60%	60%	Negligible
15	450912	306593	1.5	7.26	7.27	0.01	0%	60%	61%	Negligible
16	451316	306219	1.5	7.84	7.85	0.01	0%	65%	65%	Negligible
17	451286	306207	1.5	7.81	7.82	0.01	0%	65%	65%	Negligible
18	451290	306146	1.5	7.94	7.95	0.02	0%	66%	66%	Negligible
19	451365	306189	1.5	8.00	8.01	0.02	0%	67%	67%	Negligible
20	451396	306198	1.5	8.08	8.10	0.02	0%	67%	68%	Negligible
21	451534	306308	1.5	8.02	8.03	0.02	0%	67%	67%	Negligible
22	451479	306219	1.5	7.93	7.94	0.01	0%	66%	66%	Negligible
23	452040	306954	1.5	7.94	7.94	0.01	0%	66%	66%	Negligible
24	452061	307018	1.5	7.92	7.93	0.01	0%	66%	66%	Negligible
25	452279	306445	1.5	8.21	8.21	0.01	0%	68%	68%	Negligible
26	452438	306441	1.5	8.20	8.21	0.01	0%	68%	68%	Negligible
27	452477	306439	1.5	8.25	8.26	0.01	0%	69%	69%	Negligible
28	453023	306727	1.5	8.35	8.36	0.01	0%	70%	70%	Negligible
29	453316	307292	1.5	8.02	8.03	0.00	0%	67%	67%	Negligible
30	453379	307313	1.5	8.08	8.08	0.00	0%	67%	67%	Negligible
31	453234	307312	1.5	7.97	7.97	0.00	0%	66%	66%	Negligible
32	453145	307380	1.5	8.01	8.01	0.00	0%	67%	67%	Negligible
33	453607	307290	1.5	8.76	8.77	0.01	0%	73%	73%	Negligible
34	453716	307235	1.5	8.40	8.40	0.00	0%	70%	70%	Negligible
35	454113	307041	1.5	7.82	7.82	0.00	0%	65%	65%	Negligible
36	453755	307437	1.5	8.34	8.34	0.00	0%	70%	70%	Negligible
37	453675	307480	1.5	8.28	8.28	0.00	0%	69%	69%	Negligible

2028 $PM_{2.5}$										
Receptor Name	**X(m)**	**Y(m)**	**Z(m)**	**2028 DN**	**2028 DS**	**DS-DN**	**% Change**	**AQAL**	**AQAL**	**Impact Descriptor**
38	453422	307499	1.5	8.15	8.16	0.00	0%	68%	68%	Negligible
39	453358	307496	1.5	8.12	8.12	0.00	0%	68%	68%	Negligible
40	451212	306020	1.5	8.63	8.67	0.04	0%	72%	72%	Negligible
41	451195	305999	1.5	8.44	8.48	0.04	0%	70%	71%	Negligible
42	451154	305836	4	7.81	7.83	0.02	0%	65%	65%	Negligible
43	451146	305819	4	7.77	7.78	0.01	0%	65%	65%	Negligible
44	451129	305745	1.5	7.85	7.88	0.02	0%	65%	66%	Negligible
45	451063	305706	1.5	8.25	8.30	0.05	0%	69%	69%	Negligible
46	451189	305726	4	7.62	7.63	0.01	0%	64%	64%	Negligible
47	451279	305681	1.5	7.56	7.57	0.01	0%	63%	63%	Negligible
48	451276	305668	4	7.54	7.54	0.01	0%	63%	63%	Negligible
49	451455	305515	1.5	7.53	7.54	0.01	0%	63%	63%	Negligible
50	451461	305530	1.5	7.54	7.55	0.01	0%	63%	63%	Negligible
51	450465	304982	1.5	7.07	7.06	0.00	0%	59%	59%	Negligible
52	450303	304850	1.5	7.23	7.23	0.00	0%	60%	60%	Negligible
53	450261	304802	1.5	7.04	7.04	0.00	0%	59%	59%	Negligible
54	450835	304580	1.5	6.97	6.97	0.00	0%	58%	58%	Negligible
55	451080	304523	1.5	7.26	7.27	0.01	0%	61%	61%	Negligible
56	451289	304564	1.5	7.24	7.25	0.01	0%	60%	60%	Negligible
57	453475	303338	1.5	9.00	9.00	0.00	0%	75%	75%	Negligible
58	453497	303338	1.5	9.14	9.14	0.00	0%	76%	76%	Negligible
59	453601	303406	1.5	9.75	9.75	0.00	0%	81%	81%	Negligible
60	453722	303382	1.5	9.00	9.00	0.00	0%	75%	75%	Negligible
61	454094	303538	1.5	8.85	8.85	0.00	0%	74%	74%	Negligible
62	454104	303486	1.5	8.65	8.65	0.00	0%	72%	72%	Negligible
63	454109	303578	1.5	8.96	8.96	0.00	0%	75%	75%	Negligible
64	454020	303631	1.5	8.77	8.77	0.00	0%	73%	73%	Negligible
65	454208	303498	1.5	8.67	8.67	0.00	0%	72%	72%	Negligible
66	454331	303458	1.5	8.58	8.58	0.00	0%	72%	72%	Negligible
67	454426	303631	1.5	8.44	8.44	0.00	0%	70%	70%	Negligible
68	454455	303645	1.5	8.42	8.43	0.00	0%	70%	70%	Negligible
69	453233	304268	1.5	9.48	9.48	0.00	0%	79%	79%	Negligible

2031 NO_2										
Receptor Name	X(m)	Y(m)	Z(m)	2031 DN	2031 DS	DS-DN	% Change	AQAL	AQAL	Impact Descriptor
S1	450815.6	305792.1	1.5	7.28	7.71	0.43	1%	18%	19%	Negligible
S2	450759.9	305835	1.5	7.23	7.9	0.67	2%	18%	20%	Negligible
S3	450752.5	305850.7	1.5	7.22	7.93	0.71	2%	18%	20%	Negligible
S4	450741.4	305944.2	1.5	7.2	7.75	0.55	1%	18%	19%	Negligible
S5	450787.9	306032.1	1.5	7.2	7.77	0.57	1%	18%	19%	Negligible
S6	450803	306026	1.5	7.21	7.86	0.65	2%	18%	20%	Negligible
S7	450755.7	305935.2	1.5	7.21	7.9	0.69	2%	18%	20%	Negligible
S8	450572.9	306317.1	1.5	7.26	7.82	0.56	1%	18%	20%	Negligible
S9	450627	306281.4	1.5	7.2	7.7	0.50	1%	18%	19%	Negligible
S10	450706.8	306260	1.5	7.21	7.77	0.56	1%	18%	19%	Negligible
1	450537.3	306448	1.5	7.41	8.18	0.77	2%	19%	20%	Negligible
2	450531.7	306417.3	1.5	7.39	8.19	0.80	2%	18%	20%	Negligible
3	450530.9	306381.6	1.5	7.36	8.07	0.71	2%	18%	20%	Negligible
4	450559	306339.5	1.5	7.35	8.04	0.69	2%	18%	20%	Negligible
5	450572.2	306345.6	1.5	7.42	8.41	0.99	2%	19%	21%	Negligible
6	450553.9	306371.8	1.5	7.45	8.49	1.04	3%	19%	21%	Negligible
7	450546	306384.8	1.5	7.43	8.4	0.97	2%	19%	21%	Negligible
8	450544.7	306415.2	1.5	7.48	8.58	1.10	3%	19%	21%	Negligible
9	450550.8	306443	1.5	7.48	8.5	1.02	3%	19%	21%	Negligible
10	450654.2	306491.7	1.5	7.48	7.55	0.07	0%	19%	19%	Negligible
11	450723.3	306513.3	1.5	7.6	7.62	0.02	0%	19%	19%	Negligible
12	450749.8	306516.5	1.5	7.58	7.6	0.02	0%	19%	19%	Negligible
13	450830.7	306517.3	1.5	7.48	7.49	0.01	0%	19%	19%	Negligible
14	450657	306549	1.5	7.79	7.82	0.03	0%	19%	20%	Negligible
15	450912	306593	1.5	7.92	7.89	-0.03	0%	20%	20%	Negligible
16	451316	306219	1.5	8.87	8.83	-0.04	0%	22%	22%	Negligible
17	451286	306207	1.5	8.72	8.68	-0.04	0%	22%	22%	Negligible
18	451290	306146	1.5	9.47	9.34	-0.13	0%	24%	23%	Negligible
19	451365	306189	1.5	9.7	9.79	0.09	0%	24%	24%	Negligible
20	451396	306198	1.5	10.08	10.23	0.15	0%	25%	26%	Negligible
21	451534	306308	1.5	9.73	9.88	0.15	0%	24%	25%	Negligible
22	451479	306219	1.5	9.3	9.41	0.11	0%	23%	24%	Negligible
23	452040	306954	1.5	9.03	9.13	0.10	0%	23%	23%	Negligible
24	452061	307018	1.5	8.96	9.05	0.09	0%	22%	23%	Negligible
25	452279	306445	1.5	10.36	10.46	0.10	0%	26%	26%	Negligible
26	452438	306441	1.5	10.42	10.52	0.10	0%	26%	26%	Negligible
27	452477	306439	1.5	10.69	10.79	0.10	0%	27%	27%	Negligible
28	453023	306727	1.5	15.08	15.25	0.17	0%	38%	38%	Negligible
29	453316	307292	1.5	10.27	10.31	0.04	0%	26%	26%	Negligible
30	453379	307313	1.5	10.64	10.68	0.04	0%	27%	27%	Negligible
31	453234	307312	1.5	9.87	9.89	0.02	0%	25%	25%	Negligible
32	453145	307380	1.5	9.98	10.01	0.03	0%	25%	25%	Negligible
33	453607	307290	1.5	15.82	15.92	0.10	0%	40%	40%	Negligible
34	453716	307235	1.5	13.39	13.45	0.06	0%	33%	34%	Negligible
35	454113	307041	1.5	10.61	10.63	0.02	0%	27%	27%	Negligible
36	453755	307437	1.5	13.19	13.23	0.04	0%	33%	33%	Negligible
37	453675	307480	1.5	12.54	12.57	0.03	0%	31%	31%	Negligible

2031 NO_2										
Receptor Name	**X(m)**	**Y(m)**	**Z(m)**	**2031 DN**	**2031 DS**	**DS-DN**	**% Change**	**AQAL**	**AQAL**	**Impact Descriptor**
38	453422	307499	1.5	11.5	11.52	0.02	0%	29%	29%	Negligible
39	453358	307496	1.5	11.19	11.22	0.03	0%	28%	28%	Negligible
40	451212	306020	1.5	12.74	12.2	-0.54	-1%	32%	31%	Negligible
41	451195	305999	1.5	12.52	12.03	-0.49	-1%	31%	30%	Negligible
42	451154	305836	4	9.43	9.3	-0.13	0%	24%	23%	Negligible
43	451146	305819	4	9.19	9.09	-0.10	0%	23%	23%	Negligible
44	451129	305745	1.5	9.77	9.65	-0.12	0%	24%	24%	Negligible
45	451063	305706	1.5	11.63	11.43	-0.20	-1%	29%	29%	Negligible
46	451189	305726	4	8.51	8.54	0.03	0%	21%	21%	Negligible
47	451279	305681	1.5	8.12	8.27	0.15	0%	20%	21%	Negligible
48	451276	305668	4	8.02	8.08	0.06	0%	20%	20%	Negligible
49	451455	305515	1.5	7.98	8.11	0.13	0%	20%	20%	Negligible
50	451461	305530	1.5	8.01	8.16	0.15	0%	20%	20%	Negligible
51	450465	304982	1.5	8.32	8.36	0.04	0%	21%	21%	Negligible
52	450303	304850	1.5	9.47	9.51	0.04	0%	24%	24%	Negligible
53	450261	304802	1.5	8.16	8.18	0.02	0%	20%	20%	Negligible
54	450835	304580	1.5	7.73	7.8	0.07	0%	19%	20%	Negligible
55	451080	304523	1.5	8.77	8.88	0.11	0%	22%	22%	Negligible
56	451289	304564	1.5	8.61	8.71	0.10	0%	22%	22%	Negligible
57	453475	303338	1.5	16.81	16.81	0.00	0%	42%	42%	Negligible
58	453497	303338	1.5	17.91	17.91	0.00	0%	45%	45%	Negligible
59	453601	303406	1.5	21.93	21.92	-0.01	0%	55%	55%	Negligible
60	453722	303382	1.5	16.34	16.34	0.00	0%	41%	41%	Negligible
61	454094	303538	1.5	14.16	14.16	0.00	0%	35%	35%	Negligible
62	454104	303486	1.5	12.9	12.91	0.01	0%	32%	32%	Negligible
63	454109	303578	1.5	14.55	14.56	0.01	0%	36%	36%	Negligible
64	454020	303631	1.5	13.39	13.4	0.01	0%	33%	34%	Negligible
65	454208	303498	1.5	12.73	12.74	0.01	0%	32%	32%	Negligible
66	454331	303458	1.5	12	12.01	0.01	0%	30%	30%	Negligible
67	454426	303631	1.5	11.29	11.29	0.00	0%	28%	28%	Negligible
68	454455	303645	1.5	11.2	11.2	0.00	0%	28%	28%	Negligible
69	453233	304268	1.5	20.65	20.66	0.01	0%	52%	52%	Negligible

2031 PM_{10}										
Receptor Name	X(m)	Y(m)	Z(m)	2031 DN	2031 DS	DS-DN	% Change	AQAL	AQAL	Impact Descriptor
S1	450815.6	305792.1	1.5	12.34	12.51	0.17	0%	31%	31%	Negligible
S2	450759.9	305835	1.5	12.32	12.59	0.27	1%	31%	31%	Negligible
S3	450752.5	305850.7	1.5	12.32	12.60	0.28	1%	31%	32%	Negligible
S4	450741.4	305944.2	1.5	12.31	12.53	0.22	1%	31%	31%	Negligible
S5	450787.9	306032.1	1.5	12.31	12.54	0.23	1%	31%	31%	Negligible
S6	450803	306026	1.5	12.31	12.57	0.26	1%	31%	31%	Negligible
S7	450755.7	305935.2	1.5	12.31	12.59	0.28	1%	31%	31%	Negligible
S8	450572.9	306317.1	1.5	14.02	14.24	0.22	1%	35%	36%	Negligible
S9	450627	306281.4	1.5	13.99	14.19	0.20	0%	35%	35%	Negligible
S10	450706.8	306260	1.5	14.00	14.22	0.22	1%	35%	36%	Negligible
1	450537.3	306448	1.5	14.08	14.39	0.31	1%	35%	36%	Negligible
2	450531.7	306417.3	1.5	14.07	14.39	0.32	1%	35%	36%	Negligible
3	450530.9	306381.6	1.5	14.06	14.35	0.29	1%	35%	36%	Negligible
4	450559	306339.5	1.5	14.05	14.33	0.28	1%	35%	36%	Negligible
5	450572.2	306345.6	1.5	14.08	14.49	0.40	1%	35%	36%	Negligible
6	450553.9	306371.8	1.5	14.09	14.52	0.42	1%	35%	36%	Negligible
7	450546	306384.8	1.5	14.09	14.48	0.39	1%	35%	36%	Negligible
8	450544.7	306415.2	1.5	14.11	14.55	0.45	1%	35%	36%	Negligible
9	450550.8	306443	1.5	14.11	14.52	0.42	1%	35%	36%	Negligible
10	450654.2	306491.7	1.5	14.10	14.13	0.03	0%	35%	35%	Negligible
11	450723.3	306513.3	1.5	14.15	14.16	0.01	0%	35%	35%	Negligible
12	450749.8	306516.5	1.5	14.14	14.15	0.01	0%	35%	35%	Negligible
13	450830.7	306517.3	1.5	14.10	14.11	0.01	0%	35%	35%	Negligible
14	450657	306549	1.5	14.23	14.24	0.01	0%	36%	36%	Negligible
15	450912	306593	1.5	14.28	14.27	-0.01	0%	36%	36%	Negligible
16	451316	306219	1.5	15.31	15.29	-0.01	0%	38%	38%	Negligible
17	451286	306207	1.5	15.25	15.23	-0.02	0%	38%	38%	Negligible
18	451290	306146	1.5	15.51	15.46	-0.05	0%	39%	39%	Negligible
19	451365	306189	1.5	15.63	15.66	0.03	0%	39%	39%	Negligible
20	451396	306198	1.5	15.81	15.86	0.06	0%	40%	40%	Negligible
21	451534	306308	1.5	15.67	15.73	0.06	0%	39%	39%	Negligible
22	451479	306219	1.5	15.49	15.54	0.05	0%	39%	39%	Negligible
23	452040	306954	1.5	14.57	14.62	0.04	0%	36%	37%	Negligible
24	452061	307018	1.5	14.30	14.33	0.04	0%	36%	36%	Negligible
25	452279	306445	1.5	15.08	15.12	0.04	0%	38%	38%	Negligible
26	452438	306441	1.5	15.06	15.10	0.04	0%	38%	38%	Negligible
27	452477	306439	1.5	15.15	15.20	0.04	0%	38%	38%	Negligible
28	453023	306727	1.5	15.08	15.15	0.07	0%	38%	38%	Negligible
29	453316	307292	1.5	15.93	15.94	0.01	0%	40%	40%	Negligible
30	453379	307313	1.5	16.03	16.04	0.01	0%	40%	40%	Negligible
31	453234	307312	1.5	15.83	15.84	0.01	0%	40%	40%	Negligible
32	453145	307380	1.5	15.92	15.93	0.01	0%	40%	40%	Negligible
33	453607	307290	1.5	17.26	17.30	0.04	0%	43%	43%	Negligible
34	453716	307235	1.5	16.57	16.60	0.02	0%	41%	41%	Negligible
35	454113	307041	1.5	15.31	15.32	0.01	0%	38%	38%	Negligible
36	453755	307437	1.5	16.47	16.48	0.01	0%	41%	41%	Negligible
37	453675	307480	1.5	16.33	16.34	0.01	0%	41%	41%	Negligible

2031 PM_{10}										
Receptor Name	**X(m)**	**Y(m)**	**Z(m)**	**2031 DN**	**2031 DS**	**DS-DN**	**% Change**	**AQAL**	**AQAL**	**Impact Descriptor**
38	453422	307499	1.5	16.11	16.12	0.01	0%	40%	40%	Negligible
39	453358	307496	1.5	16.05	16.05	0.01	0%	40%	40%	Negligible
40	451212	306020	1.5	16.96	16.72	-0.23	-1%	42%	42%	Negligible
41	451195	305999	1.5	15.18	14.97	-0.21	-1%	38%	37%	Negligible
42	451154	305836	4	13.87	13.81	-0.06	0%	35%	35%	Negligible
43	451146	305819	4	13.76	13.72	-0.04	0%	34%	34%	Negligible
44	451129	305745	1.5	13.95	13.90	-0.05	0%	35%	35%	Negligible
45	451063	305706	1.5	14.77	14.67	-0.10	0%	37%	37%	Negligible
46	451189	305726	4	13.47	13.48	0.01	0%	34%	34%	Negligible
47	451279	305681	1.5	13.33	13.39	0.06	0%	33%	33%	Negligible
48	451276	305668	4	13.29	13.31	0.02	0%	33%	33%	Negligible
49	451455	305515	1.5	13.27	13.33	0.05	0%	33%	33%	Negligible
50	451461	305530	1.5	13.28	13.34	0.06	0%	33%	33%	Negligible
51	450465	304982	1.5	14.21	14.22	0.01	0%	36%	36%	Negligible
52	450303	304850	1.5	14.53	14.54	0.01	0%	36%	36%	Negligible
53	450261	304802	1.5	14.14	14.15	0.01	0%	35%	35%	Negligible
54	450835	304580	1.5	14.02	14.03	0.02	0%	35%	35%	Negligible
55	451080	304523	1.5	13.32	13.36	0.04	0%	33%	33%	Negligible
56	451289	304564	1.5	13.27	13.31	0.04	0%	33%	33%	Negligible
57	453475	303338	1.5	17.33	17.33	0.00	0%	43%	43%	Negligible
58	453497	303338	1.5	17.53	17.53	0.00	0%	44%	44%	Negligible
59	453601	303406	1.5	18.59	18.59	0.00	0%	46%	46%	Negligible
60	453722	303382	1.5	17.40	17.40	0.00	0%	43%	43%	Negligible
61	454094	303538	1.5	16.40	16.41	0.00	0%	41%	41%	Negligible
62	454104	303486	1.5	16.01	16.01	0.00	0%	40%	40%	Negligible
63	454109	303578	1.5	16.63	16.64	0.00	0%	42%	42%	Negligible
64	454020	303631	1.5	16.24	16.25	0.00	0%	41%	41%	Negligible
65	454208	303498	1.5	16.06	16.07	0.00	0%	40%	40%	Negligible
66	454331	303458	1.5	15.90	15.90	0.00	0%	40%	40%	Negligible
67	454426	303631	1.5	15.60	15.60	0.00	0%	39%	39%	Negligible
68	454455	303645	1.5	15.57	15.57	0.00	0%	39%	39%	Negligible
69	453233	304268	1.5	18.71	18.72	0.00	0%	47%	47%	Negligible

2031 $PM_{2.5}$										
Receptor Name	X(m)	Y(m)	Z(m)	2031 DN	2031 DS	DS-DN	% Change	AQAL	AQAL	Impact Descriptor
S1	450815.6	305792.1	1.5	6.82	6.91	0.09	1%	57%	58%	Negligible
S2	450759.9	305835	1.5	6.81	6.95	0.14	1%	57%	58%	Negligible
S3	450752.5	305850.7	1.5	6.81	6.96	0.15	1%	57%	58%	Negligible
S4	450741.4	305944.2	1.5	6.81	6.92	0.11	1%	57%	58%	Negligible
S5	450787.9	306032.1	1.5	6.81	6.93	0.12	1%	57%	58%	Negligible
S6	450803	306026	1.5	6.81	6.95	0.13	1%	57%	58%	Negligible
S7	450755.7	305935.2	1.5	6.81	6.95	0.14	1%	57%	58%	Negligible
S8	450572.9	306317.1	1.5	7.14	7.25	0.12	1%	59%	60%	Negligible
S9	450627	306281.4	1.5	7.12	7.23	0.10	1%	59%	60%	Negligible
S10	450706.8	306260	1.5	7.12	7.24	0.12	1%	59%	60%	Negligible
1	450537.3	306448	1.5	7.17	7.33	0.16	1%	60%	61%	Negligible
2	450531.7	306417.3	1.5	7.16	7.33	0.17	1%	60%	61%	Negligible
3	450530.9	306381.6	1.5	7.16	7.30	0.15	1%	60%	61%	Negligible
4	450559	306339.5	1.5	7.15	7.30	0.14	1%	60%	61%	Negligible
5	450572.2	306345.6	1.5	7.17	7.38	0.21	2%	60%	61%	Negligible
6	450553.9	306371.8	1.5	7.17	7.39	0.22	2%	60%	62%	Negligible
7	450546	306384.8	1.5	7.17	7.38	0.20	2%	60%	61%	Negligible
8	450544.7	306415.2	1.5	7.18	7.41	0.23	2%	60%	62%	Negligible
9	450550.8	306443	1.5	7.18	7.40	0.22	2%	60%	62%	Negligible
10	450654.2	306491.7	1.5	7.18	7.19	0.01	0%	60%	60%	Negligible
11	450723.3	306513.3	1.5	7.20	7.21	0.00	0%	60%	60%	Negligible
12	450749.8	306516.5	1.5	7.20	7.20	0.00	0%	60%	60%	Negligible
13	450830.7	306517.3	1.5	7.18	7.18	0.00	0%	60%	60%	Negligible
14	450657	306549	1.5	7.25	7.25	0.01	0%	60%	60%	Negligible
15	450912	306593	1.5	7.27	7.27	0.00	0%	61%	61%	Negligible
16	451316	306219	1.5	7.86	7.85	-0.01	0%	66%	65%	Negligible
17	451286	306207	1.5	7.83	7.82	-0.01	0%	65%	65%	Negligible
18	451290	306146	1.5	7.97	7.94	-0.02	0%	66%	66%	Negligible
19	451365	306189	1.5	8.03	8.05	0.02	0%	67%	67%	Negligible
20	451396	306198	1.5	8.12	8.15	0.03	0%	68%	68%	Negligible
21	451534	306308	1.5	8.05	8.08	0.03	0%	67%	67%	Negligible
22	451479	306219	1.5	7.96	7.98	0.02	0%	66%	67%	Negligible
23	452040	306954	1.5	7.95	7.97	0.02	0%	66%	66%	Negligible
24	452061	307018	1.5	7.94	7.95	0.02	0%	66%	66%	Negligible
25	452279	306445	1.5	8.22	8.24	0.02	0%	68%	69%	Negligible
26	452438	306441	1.5	8.21	8.23	0.02	0%	68%	69%	Negligible
27	452477	306439	1.5	8.26	8.28	0.02	0%	69%	69%	Negligible
28	453023	306727	1.5	8.37	8.41	0.04	0%	70%	70%	Negligible
29	453316	307292	1.5	8.04	8.04	0.01	0%	67%	67%	Negligible
30	453379	307313	1.5	8.09	8.10	0.01	0%	67%	68%	Negligible
31	453234	307312	1.5	7.98	7.99	0.01	0%	67%	67%	Negligible
32	453145	307380	1.5	8.02	8.03	0.01	0%	67%	67%	Negligible
33	453607	307290	1.5	8.79	8.81	0.02	0%	73%	73%	Negligible
34	453716	307235	1.5	8.41	8.42	0.01	0%	70%	70%	Negligible
35	454113	307041	1.5	7.83	7.83	0.00	0%	65%	65%	Negligible
36	453755	307437	1.5	8.36	8.36	0.01	0%	70%	70%	Negligible
37	453675	307480	1.5	8.29	8.29	0.01	0%	69%	69%	Negligible

2031 $PM_{2.5}$										
Receptor Name	**X(m)**	**Y(m)**	**Z(m)**	**2031 DN**	**2031 DS**	**DS-DN**	**% Change**	**AQAL**	**AQAL**	**Impact Descriptor**
38	453422	307499	1.5	8.16	8.17	0.00	0%	68%	68%	Negligible
39	453358	307496	1.5	8.12	8.13	0.00	0%	68%	68%	Negligible
40	451212	306020	1.5	8.72	8.60	-0.12	-1%	73%	72%	Negligible
41	451195	305999	1.5	8.52	8.41	-0.11	-1%	71%	70%	Negligible
42	451154	305836	4	7.84	7.81	-0.03	0%	65%	65%	Negligible
43	451146	305819	4	7.79	7.77	-0.02	0%	65%	65%	Negligible
44	451129	305745	1.5	7.89	7.86	-0.03	0%	66%	66%	Negligible
45	451063	305706	1.5	8.32	8.27	-0.05	0%	69%	69%	Negligible
46	451189	305726	4	7.64	7.64	0.01	0%	64%	64%	Negligible
47	451279	305681	1.5	7.56	7.59	0.03	0%	63%	63%	Negligible
48	451276	305668	4	7.54	7.56	0.01	0%	63%	63%	Negligible
49	451455	305515	1.5	7.54	7.56	0.03	0%	63%	63%	Negligible
50	451461	305530	1.5	7.54	7.57	0.03	0%	63%	63%	Negligible
51	450465	304982	1.5	7.09	7.09	0.01	0%	59%	59%	Negligible
52	450303	304850	1.5	7.27	7.27	0.01	0%	61%	61%	Negligible
53	450261	304802	1.5	7.05	7.06	0.00	0%	59%	59%	Negligible
54	450835	304580	1.5	6.98	6.99	0.01	0%	58%	58%	Negligible
55	451080	304523	1.5	7.30	7.32	0.02	0%	61%	61%	Negligible
56	451289	304564	1.5	7.27	7.29	0.02	0%	61%	61%	Negligible
57	453475	303338	1.5	9.04	9.04	0.00	0%	75%	75%	Negligible
58	453497	303338	1.5	9.18	9.18	0.00	0%	76%	76%	Negligible
59	453601	303406	1.5	9.81	9.81	0.00	0%	82%	82%	Negligible
60	453722	303382	1.5	9.04	9.04	0.00	0%	75%	75%	Negligible
61	454094	303538	1.5	8.88	8.88	0.00	0%	74%	74%	Negligible
62	454104	303486	1.5	8.67	8.67	0.00	0%	72%	72%	Negligible
63	454109	303578	1.5	9.00	9.00	0.00	0%	75%	75%	Negligible
64	454020	303631	1.5	8.80	8.80	0.00	0%	73%	73%	Negligible
65	454208	303498	1.5	8.70	8.70	0.00	0%	72%	72%	Negligible
66	454331	303458	1.5	8.61	8.61	0.00	0%	72%	72%	Negligible
67	454426	303631	1.5	8.45	8.45	0.00	0%	70%	70%	Negligible
68	454455	303645	1.5	8.44	8.44	0.00	0%	70%	70%	Negligible
69	453233	304268	1.5	9.55	9.55	0.00	0%	80%	80%	Negligible

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APPENDICES

APPENDIX J

Mitigation for all sites: Communications

Mitigation measure	Low Risk	Medium Risk	High Risk
1. Develop and implement a stakeholder communications plan that includes community engagement before work commences on site.	N	H	H
2. 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.	H	H	H
3. Display the head or regional office contact information	H	H	H

Mitigation for all sites: Dust Management

Mitigation measure	Low Risk	Medium Risk	High Risk
4. Develop and implement a Dust Management Plan (DMP), which may include measures to control other emissions, approved by the Local Authority. The level of detail will depend on the risk, and should include as a minimum the highly recommended measures in this document. The desirable measures should be included as appropriate for the site. In London additional measures may be required to ensure compliance with the Mayor of London's guidance. The DMP may include monitoring of dust deposition, dust flux, real-time PM10 continuous monitoring and/or visual inspections.	D	H	H
Site Management			
5. 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.	H	H	H
6. Make the complaints log available to the local authority when asked.	H	H	H
7. 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.	H	H	H
8. Hold regular liaison meetings with other high risk construction sites within 500m 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.	N	N	H
Monitoring			
9. 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 100m of site boundary, with cleaning to be provided if necessary.	D	D	H
10. 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	H	H	H
11. 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.	H	H	H
12. 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.	N	H	H
Preparing and maintaining the site			
13. Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.	H	H	H
14. Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on site.	H	H	H
15. Fully enclose site or specific operations where there is a high potential for dust production and the site is actives for an extensive period	D	H	H
16. Avoid site runoff of water or mud.	H	H	H
17. Keep site fencing, barriers and scaffolding clean using wet methods.	D	H	H

Mitigation measure	Low Risk	Medium Risk	High Risk
18. 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.	D	H	H
19. Cover, seed or fence stockpiles to prevent wind whipping.	D	H	H
Operating vehicle/machinery and sustainable travel			
20. Ensure all on-road vehicles comply with the requirements of the London Low Emission Zone and the London NRMM standards, where applicable	H	H	H
21. Ensure all vehicles switch off engines when stationary - no idling vehicles.	H	H	H
22. Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.	H	H	H
23. 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)	D	D	H
24. Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.	N	H	H
25. Implement a Travel Plan that supports and encourages sustainable travel (public transport, cycling, walking, and car-sharing)	N	D	H
Operations			
26. 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.	H	H	H
27. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.	H	H	H
28. Use enclosed chutes and conveyors and covered skips.	H	H	H
29. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.	H	H	H
30. 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.	D	H	H
Waste management			
31. Avoid bonfires and burning of waste materials.	H	H	H

Measures specific to demolition

Mitigation measure	Low Risk	Medium Risk	High Risk
32. Soft strip inside buildings before demolition (retaining walls and windows in the rest of the building where possible, to provide a screen against dust).	D	D	H
33. 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.	H	H	H
34. Avoid explosive blasting, using appropriate manual or mechanical alternatives.	H	H	H
35. Bag and remove any biological debris or damp down such material before demolition.	H	H	H

Measures specific to earthworks

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

Measures specific to construction

Mitigation measure	Low Risk	Medium Risk	High Risk
39. Avoid scabbling (roughening of concrete surfaces) if possible	D	D	H
40. 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.	D	H	H
41. 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.	N	D	H
42. For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.	N	D	D

Measures specific to trackout

Mitigation measure	Low Risk	Medium Risk	High Risk
43. 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.	D	H	H
44. Avoid dry sweeping of large areas.	D	H	H
45. Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.	D	H	H
46. Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.	N	H	H
47. Record all inspections of haul routes and any subsequent action in a site log book.	D	H	H
48. Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.	N	H	H
49. Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).	D	H	H
50. 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.	N	H	H
51. Access gates to be located at least 10m from receptors where possible.	N	H	H

Key to Tables:

H	Highly recommended
D	Desirable
N	Not required

- CIVIL ENGINEERING
- TRANSPORT
- FLOOD RISK & DRAINAGE
- STRUCTURES
- GEO-ENVIRONMENTAL
- ACOUSTIC AIR
- UTILITIES
- GEOMATICS
- LIGHTING
- EXPERT WITNESS

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