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Noise | Vibration | Air Quality

Air Quality Assessment

Land North of Thaxted Road, Saffron Walden

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Air Quality Assessment

Project: LAND NORTH OF THAXTED ROAD, SAFFRON WALDEN

Report reference: RP02-23407-R0

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1.2 The assessment was carried out in accordance with relevant local and national planning policy and guidance.

1.3 The site is not located within an existing Air Quality Management Area (AQMA). However, it is 670m south-east of Saffron Walden AQMA, which was declared by Uttlesford District Council (UDC) due to exceedances of the annual mean Air Quality Objective (AQO) for nitrogen dioxide (NO_2). Air quality in the vicinity of the site is primarily influenced by vehicle emissions on the B184 Thaxted Road and the local road network.

1.4 Emissions of construction phase dust and particulate matter (PM_{10}) were assessed in accordance with Institute of Air Quality Management (IAQM) guidance. A Low Risk of both dust soiling and PM_{10} health effects has been identified, in the absence of mitigation. Suitable best practice mitigation measures have been recommended and no significant residual air quality impacts are expected.

1.5 A detailed atmospheric dispersion model was utilised to predict NO_2 and particulate matter (PM_{10} and $PM_{2.5}$) concentrations at relevant sensitive receptor locations within the study area during the operation of the development. This followed Department for Environment, Food and Rural Affairs (Defra) and Environmental Protection UK (EPUK) & IAQM guidance.

1.6 The results indicate that pollutant concentrations at proposed sensitive receptors will be below the relevant AQOs during the operational phase, with no requirement for additional mitigation. Furthermore, no significant impacts on local air quality as a result of development-generated traffic are anticipated. Accordingly, the overall effect of the proposed development is considered 'not significant' with regard to air quality.

1.7 In summary, it is our view that the site is suitable for the development in terms of air quality and that there are no air quality constraints with respect to planning consent.

2. INTRODUCTION

2.1 Cass Allen has been instructed by Kier Ventures Ltd to assess the potential air quality impact of a proposed residential development at Land North of Thaxted Road, Saffron Walden in Essex.

2.2 The assessment has been carried out in accordance with relevant local and national planning guidance.

2.3 The aims of the assessment were to consider potential impacts on local air quality, resulting from:

- Dust and particulate matter emissions generated by construction phase activities;
- Exhaust emissions from construction plant and traffic;
- The exposure of new sensitive receptors to elevated pollutant concentrations; and
- Emissions from traffic generated by the operation of the development.

2.4 Subsequently, where required, appropriate measures have been identified to minimise the impacts.

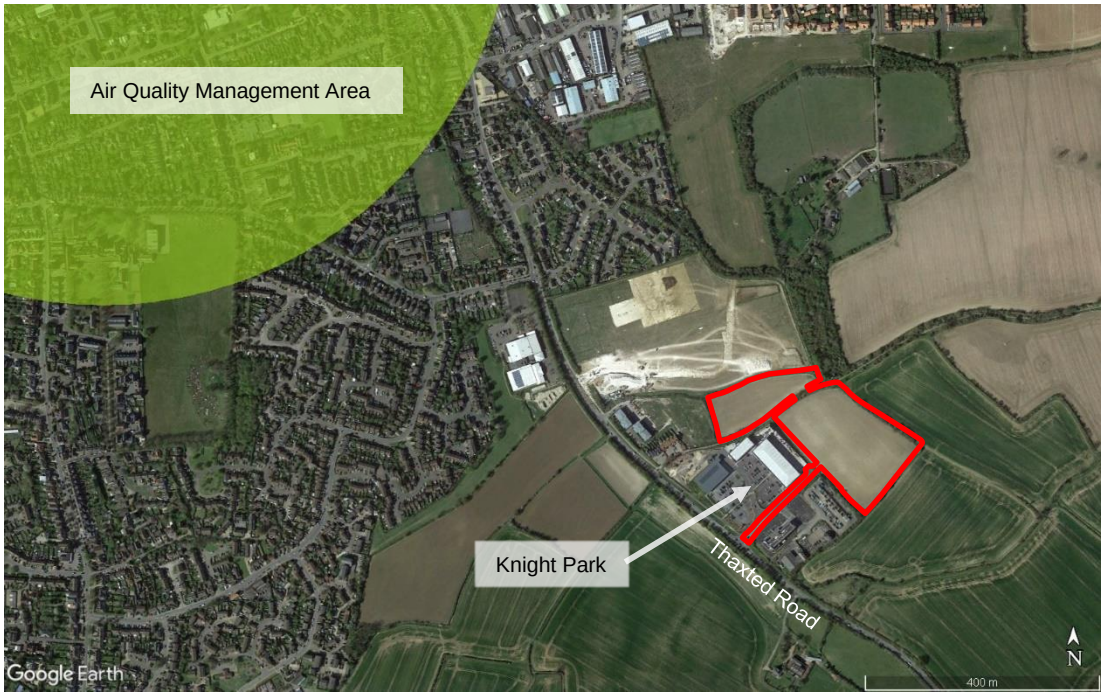
2.5 This report contains technical terminology; a glossary of terms can be found at [redacted]

3. PROJECT DESCRIPTION AND SITE CONTEXT

3.1 The site is currently vacant and is located on the south-eastern edge of the existing built-up area of Saffron Walden. To the north-west of the site is the recently developed 'Land East of Thaxted Road' residential development (planning reference: UTT/18/0824/OP). To the north-east and south-east are fields. To the south-west of the site is Knight Park, which includes the Saffron Walden Recycling Centre, a highways depot, a hotel, a gym, and various retail stores.

3.2 The site location is shown in Figure 1.

Figure 1 Site Location and Context



3.3 With regard to air quality, the site is located 670m south-east of Saffron Walden AQMA, which was declared due to exceedances of the annual mean AQO for NO_2. Accordingly, the potential for traffic generated by the development to affect NO_2 concentrations at receptor locations within the AQMA will be a key focus of the Air Quality Assessment.

3.4 The proposal is to develop the site into residential properties, with a total of up to 55 dwellings proposed, plus associated highways and amenity space.

4. PLANNING POLICY

Air Quality Legislation

4.1 The wider air quality legislation which underpins national, regional, and local planning policy, is summarised in Appendix 1.

4.2 Within the UK Air Quality Strategy (2007), standards and objectives are set for nine key air pollutants to protect health, vegetation, and ecosystems. These were revised in the Air Quality Standards Regulations 2010 to include a reduced target for $PM_{2.5}$. The national AQOs for the pollutants most associated with vehicle emissions, and therefore applicable to this assessment, are detailed in Table 1.

Table 1 UK National Air Quality Objectives

Pollutant	Objective	Averaging Period
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
	200µg/m^3 not to be exceeded more than 18 times per year	1-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
	50µg/m^3 not to be exceeded more than 35 times per year	24-hour mean
Particulate Matter ($PM_{2.5}$)	20µg/m^3	Annual mean

4.3 The above AQOs are typically applied where there is 'relevant exposure', i.e. where members of the public are likely to be present for the relevant averaging periods, or regularly exposed, and not in workplaces.

National Policy

4.4 Outline guidance for the assessment of air quality affecting new developments is given in the National Planning Policy Framework (NPPF) (September 2023). Relevant sections in this case are highlighted below:

> *105. …Significant development should be focused on locations which are or can be made sustainable, through limiting the need to travel and offering a genuine choice of transport modes. This can help to reduce congestion and emissions, and improve air quality and public health.*
>
> *174. 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 … air or noise pollution.*

185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development.

186. 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.

188. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.

Local Policy

4.5 Policy ENV 13 of the adopted Uttlesford Local Plan (January 2005) has relevance to this assessment, stating:

Policy ENV13 – Exposure to Poor Air Quality

Development that would involve users being exposed on an extended long-term basis to poor air quality outdoors near ground level will not be permitted…

4.6 Policy GEN4 also relates to air quality and states:

Policy GEN4 – Good Neighbourliness

Development and uses, whether they involve the installation of plant and machinery or not, will not be permitted where:…

b) …dust,… fumes,… exposure to other pollutants… would cause material disturbance or nuisance to occupiers of surrounding properties.

4.7 Within the emerging Draft Local Plan (Regulation 18), Core Policy 43 is particularly relevant:

Core Policy 43: Air Quality

Development will not be permitted where it might lead to significant adverse effects on health, the environment or amenity from emissions to air. Applicants must have regard to relevant UDC Air Quality Technical Guidance and are required to undertake an appropriate air quality assessment and to demonstrate that:

i. there is no adverse effect on air quality in any AQMA from the development

ii. pollution levels within any AQMA will not have a significant adverse effect on the proposed use/users

iii. development has regard to relevant UDC Air Quality Technical Guidance

iv. development within or affecting any Air Quality Management Area (AQMA) will also be expected to contribute to a reduction in levels of air pollutants within the AQMA

v. development will not lead to an increase in emissions, degradation of air quality of increase in exposure to pollutants at or above the health-based air quality objective

vi. any impacts on the proposed use from existing poor air quality are appropriately mitigated, and

vii. the development promotes sustainable transport measures and use of low emissions vehicles in order to reduce air quality impacts of vehicles.

Applicants shall, where appropriate prepare and submit with their application, a relevant assessment, taking into account guidance current at the time of application.

Where development proposals would be subject to unacceptable air quality standards or would have an unacceptable impact on air quality standards they will be refused.

Where emissions from the proposed development approach EU Limit values or national objectives the applicant will need to assess the impact on local air quality by undertaking an appropriate air quality assessment. The assessment shall have regard to guidance current at the time of the application to show that the national objectives will still be achieved.

4.8 Other relevant policies are listed in the UDC 'Air Quality Technical Planning Guidance', June 2018 (AQTPG).

4.9 To address the requirements of the national and local policies, the following key air quality matters have been considered:

- Construction phase fugitive emissions of dust and particulate matter at nearby existing receptors;
- Construction phase plant and vehicle emissions at existing receptors;
- Vehicle emissions exposing proposed receptors to elevated pollutant concentrations; and
- Emissions from traffic generated by the operation of the development at existing receptors.

5. ASSESSMENT METHODOLOGY

5.1 The scope and methodology for this assessment has been determined with regard to Defra 'Local Air Quality Technical Guidance', August 2022 (TG22), EPUK & IAQM, 'Land Use Planning & Development Control: Planning for Air Quality', January 2017 (LUPDC) and the AQTPG. Reference has also been made to other relevant technical guidance, where applicable.

5.2 A review of previous planning applications in the vicinity of the site was also undertaken, including the Air Quality Assessments for 'Land East of Thaxted Road' and 'Land To The West Of Thaxted Road' (planning references UTT/18/0824/OP and S62A/2022/0014, respectively).

5.3 The below scope of works was determined following this review.

Construction Phase

5.4 The assessment of potential air quality impacts during the construction phase has focussed on the generation and dispersion of dust and PM_{10}, following the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction', August 2023, methodology, summarised as follows:

- Step 1 – screen the need for an assessment: impacts to sensitive human and ecological receptors should be considered where they are located within 250m or 50m of the site boundary, respectively. These receptors should also be considered if they are within 50m of a route used by construction vehicles up to 250m from the site entrance.
- Step 2A – estimate the dust emission magnitude for each of the main construction activities – demolition, earthworks, general construction, and trackout.
- Step 2B – determine the sensitivity of the receiving environment, through consideration of factors such as meteorological conditions, the number of nearby receptors, their proximity and their sensitivity. Other factors to consider are detailed in Box 9 of the guidance. A wind rose for nearby Stansted Airport meteorological station is included in Appendix 2.
- Step 2C – define the risk of impacts.
- Step 3 – identify site-specific mitigation requirements (in addition to basic project controls).

5.5 In addition, exhaust emissions from construction vehicles and plant may impact local air quality. The potential for significant effects resulting from these emissions has also been considered with reference to screening and significance criteria in LUPDC.

Operational Phase

5.6 LUPDC indicates that a change in Light Duty Vehicle (LDV) flows of 500 Annual Average Daily Traffic (AADT) and/or Heavy Duty Vehicle (HDV) flows of 100 AADT or more is potentially significant, and likely to require further assessment. This also applies to a change in LDV flows of 100 AADT and/or HDV flows of 25 AADT or more on routes through or close to an AQMA. These criteria were used to determine the study area, in liaison with the project's Transport Consultant.

5.7 The development also has the potential to expose future users to elevated pollutant concentrations. Concentrations of NO_2, PM_{10} and $PM_{2.5}$ have been considered in the operational phase assessment as road traffic is a major source of these pollutants and their concentrations are often close to, or in exceedance of, the relevant AQOs in urban locations. Cambridge Environmental Research Consultants' (CERC) ADMS-Roads (version 5.0.1.3) atmospheric dispersion model has been used to predict pollutant concentrations at the future receptor (FR) existing receptor (ER) and proposed receptor (PR) locations detailed in Table 2.

Table 2 Modelled Receptor Locations

ID	Description	Grid Reference (OSGB)	Height (m)
FR1	Planned receptors at Land To The West of Thaxted Road (locations derived from Air Quality Assessment for S62A/2022/0014)	554770.0, 237469.0	1.5
FR2		554911.0, 237329.0	1.5
ER1	1 Tiptofts Lane	554907.8, 237370.2	1.5
ER2	Western boundary of Cardamon Road development	554753.6, 237570.9	1.5
ER3	63 Peaslands Road	554686.4, 237682.8	1.5
ER4	72 Peaslands Road	554633.9, 237632.4	1.5
ER5	20 Linton Close	554721.9, 237679.2	1.5
ER6	87 Thaxted Road	554564.5, 238050.7	1.5
ER7	3 Thaxted Road	554370.4, 238400.5	1.5
ER8	2 Thaxted Road	554396.5, 238385.7	1.5
ER9	45 East Street	554335.3, 238454.5	1.5
ER10	64 East Street	554341.8, 238435.7	1.5
ER11	39-41 East Street	554222.9, 238432.7	1.5
ER12	Farmadine House	554257.4, 238408.3	1.5
ER13	1 Audley Road	554214.9, 238394.7	1.5
ER14	2 Farmadine	554206.7, 238367.1	1.5
ER15	9 Vanoli Close	554392.9, 238454.9	1.5
ER16	5 Radwinter Road	554438.5, 238487.4	1.5
PR1	Proposed Receptors: note, these are worst-case locations on the site boundary, either side of access road.	555195.1, 237352.5	1.5
PR2		555187.9, 237359.4	1.5

5.8 A review of the Multi-Agency Geographic Information for the Countryside (MAGIC) website did not identify any statutory designated ecological sites in the vicinity, and therefore these have been excluded from further assessment.

5.9 To assess the development impact on local air quality, the following scenarios have been modelled:

- 2022 – Model Verification;
- 2028 – Anticipated Opening Year, Without Development; and
- 2028 – Anticipated Opening Year, With Development.

5.10 Details of the traffic data used in the model are included in Appendix 3, and other model inputs such as emission factors, verification and adjustment, in Appendix 4.

5.11 The study area, including modelled road links and receptors, is shown in Figure 2, below.

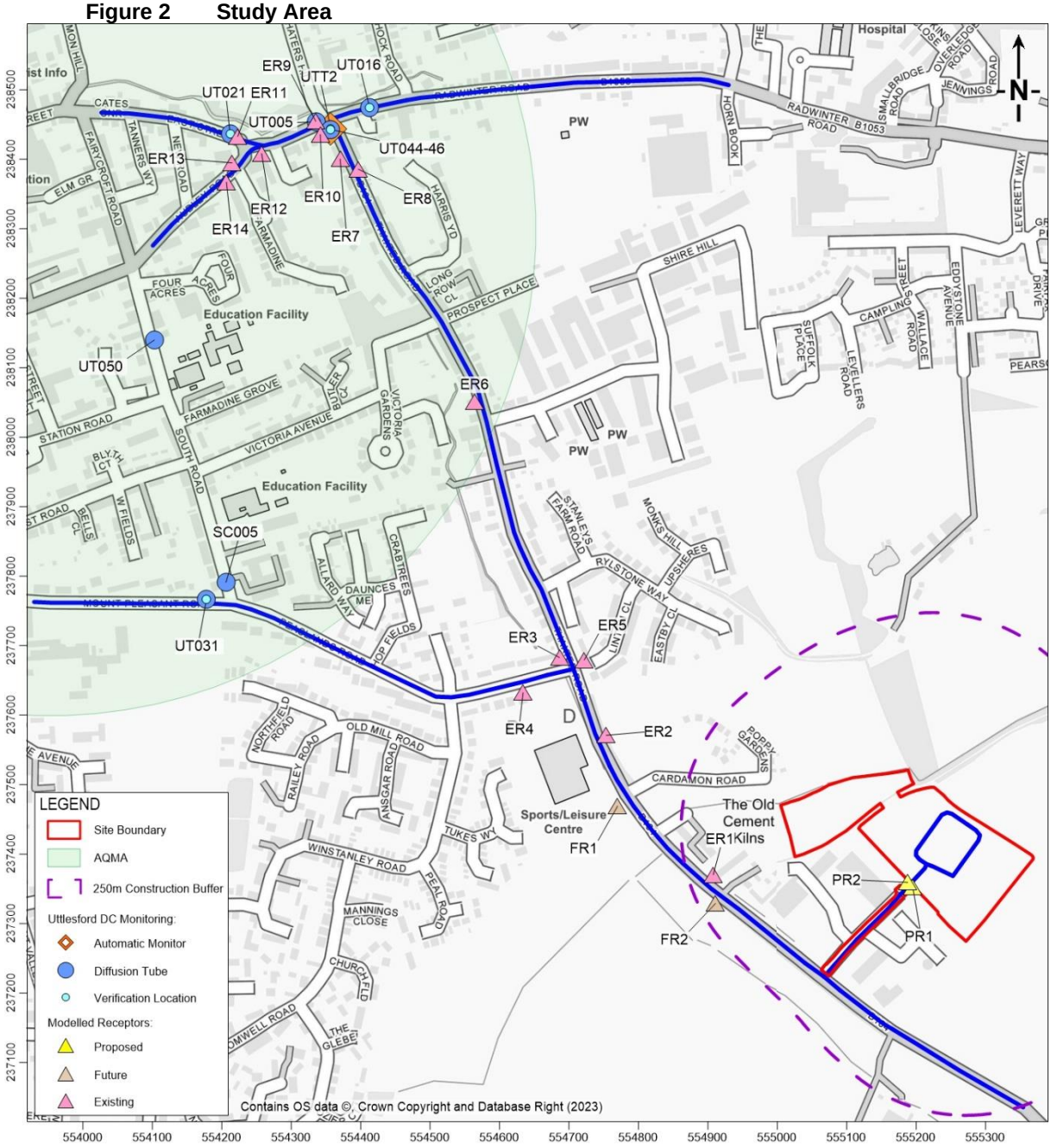
Significance Criteria

5.12 Significance criteria applicable to the assessment of vehicle emissions impacts have been derived from LUPDC. Where the 'without' and 'with' development pollutant concentrations are predicted at an individual receptor, the guidance recommends expressing the magnitude of incremental change as a proportion of the Air Quality Assessment Level (normally the applicable AQO).

5.13 The LUPDC significance criteria applicable to the assessment of impacts at existing receptors are included in Appendix 5. It should be noted that, in line with LUPDC, *'the criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional judgement… the objective is to identify situations where there is a possibility of a significant effect on local air quality.'*

5.14 For proposed receptors, predicted pollutant concentrations have been compared to the relevant AQOs to determine the potential for exceedance, and therefore, the suitability of the site for the proposed use.

Figure 2 Study Area



6. BASELINE CONDITIONS

6.1 Air quality conditions in the vicinity of the site have been reviewed to provide a baseline for consideration. The collected data are included in the tables below and were obtained from UDC, plus Defra background maps.

Table 3 UDC Monitored Concentrations – NO_2

ID	Location	Type	Distance to site (km)	Monitored Annual Mean (µg/m³)				
				2018	2019	2020	2021	2022
UTT2	Thaxted Rd & Radwinter Rd Auto	Roadside	1.2	35.3	32.7	25.0	30.9	30.9
SC005	St Thomas More Primary School	Kerbside	0.9	-	-	-	-	10.8
UT005	Thaxted Rd	Kerbside	1.2	36.4	33.9	26.0	26.6	27.1
UT016	Radwinter Rd	Roadside	1.2	32.1	30.7	23.1	24.7	26.2
UT021	41 East St	Roadside	1.2	27.0	24.0	17.6	18.4	19.1
UT031	Mount Pleasant Rd	Roadside	0.9	19.8	20.7	15.2	15.8	16.2
UT044-46	Thaxted Rd (co-located w/ UTT2)	Roadside	1.2	-	37.0	31.6	30.7	31.1
UT050	South Road	Roadside	1.1	-	-	-	11.2	11.3

Note: Data obtained from UDC Annual Status Report (2023).
2020 and 2021 concentrations likely to be atypical due to COVID travel restrictions.

Table 4 Defra Mapped Background Annual Mean Concentrations (µg/m³)

2022				2028			
NO_2	NO_X	PM_{10}	$PM_{2.5}$	NO_2	NO_X	PM_{10}	$PM_{2.5}$
7.0-10.2	8.9-13.4	14.3-15.2	9.0-9.2	6.0-8.7	7.6-11.4	13.8-14.7	8.6-8.8

Note: Data obtained from https://uk-air.defra.gov.uk/data/laqm-background-home for grid square locations across the study area.

6.2 As indicated in Table 3, NO_2 concentrations in the vicinity of the site were below the 40µg/m³ annual mean AQO throughout the most recent monitoring years. No monitoring of PM_{10} or $PM_{2.5}$ is undertaken in the vicinity of the site. However, as shown in Table 4, Defra predicted background concentrations for 2022 and 2028 are 'well below' (defined by the IAQM as less than 75% of) the relevant AQOs.

7. CONSTRUCTION PHASE ASSESSMENT

7.1 The IAQM methodology has been used to assess the potential impact of dust and PM_{10} arising from on-site activities. As indicated within the guidance, the use of professional judgment is necessary, due to the diverse range of projects that are subject to dust impact assessment, meaning that it is not possible to be prescriptive as to how to assess the impacts.

7.2 As sensitive receptors were identified within the relevant IAQM screening distances, the assessment progressed to Step 2, which has been summarised in the tables below.

Table 5 Step 2A – Dust Emission Magnitude for Construction Activities

Activity	Magnitude	Explanation
Demolition	N/A	No demolition work proposed.
Earthworks	Medium	Total site area 18,000-110,000m^2, 5-10 heavy earth moving vehicles assumed.
Construction	Medium	Total building volume 12,000-75,000m^3, potentially dusty construction materials.
Trackout	Medium	20-50 outward HDV movements per day and 50-100m unpaved road length likely.

Table 6 Step 2B – Sensitivity of the Area

Potential Impact	Details	Construction Activity		
		Earthworks	Construction	Trackout
Dust Soiling	10-100 receptors within 250m of site	Low	Low	Low
Human Health	10-100 receptors within 250m of site; low background PM_{10} concentration	Low	Low	Low
Ecological	No designated sites within 50m	N/A	N/A	N/A

Table 7 Step 2C – Summary of Impact Risks to Define Site-Specific Mitigation

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

7.3 Overall, the development is considered Low Risk for both dust soiling and PM_{10} health effects, in the absence of mitigation. Following implementation of the recommended mitigation measures for Low Risk sites in Appendix 6, it is anticipated that the residual effect of the construction phase will be not significant.

7.4 With regard to construction traffic, the construction phase flows are not expected to exceed the criteria detailed in Paragraph 5.6 and therefore, significant residual effects are not anticipated.

8. OPERATIONAL PHASE ASSESSMENT – SITE SUITABILITY

8.1 To consider the suitability of the site for the proposed use, the potential for future occupants of development to be exposed to exceedances of the relevant AQOs has been assessed. Modelled predicted pollutant concentrations at proposed receptors are detailed in Table 8.

Table 8 Predicted Pollutant Concentrations at the Development in 2028

Receptor	Annual Mean Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
PR1	6.6	14.8	8.7
PR2	6.6	14.8	8.7

Note: Results are reported to the nearest 0.1µg/m^3.

8.2 The data in Table 8 show that pollutant concentrations were predicted to be well below the relevant annual AQOs at the worst-case proposed receptor locations. The predicted NO_2, PM_{10} and $PM_{2.5}$ concentrations were 6.6µg/m^3, 14.8µg/m^3 and 8.7µg/m^3 at both receptors at both receptors.

8.3 The annual mean NO_2 concentrations predicted by the model were all below 60µg/m^3. As indicated in TG22, a breach of the hourly mean AQO for NO_2 is unlikely where this is the case. Equally, exceedances of the 24-hour mean AQO for PM_{10} are not anticipated.

8.4 Accordingly, it is not anticipated that proposed receptors would be exposed to exceedances of the relevant AQOs; therefore, the site is considered suitable for the proposed use, with no requirement for additional mitigation.

9. OPERATIONAL PHASE ASSESSMENT – AIR QUALITY IMPACTS

9.1 To assess the potential air quality impacts resulting from operational phase development-generated vehicle emissions at existing receptors, dispersion modelling has been undertaken to quantify pollutant concentrations in both 'without development' and 'with development' scenarios. A summary of the worst-case impacts is provided in Table 9, with full model results detailed in Appendix 7.

Table 9 Worst-Case Predicted Operational Impacts at Existing Receptors in 2028

Pollutant	Receptor	Annual Mean Concentration (µg/m^3)			Impact Descriptor
		Without	With	Change	
Highest Absolute Concentrations					
NO_2	ER8	20.2	20.3	0.1	Negligible
PM_{10}	ER11	15.8	15.8	0.0	Negligible
$PM_{2.5}$	ER11	10.0	10.0	0.0	Negligible
Maximum Predicted Changes					
NO_2	<0.5% change predicted at all receptor locations				Negligible
PM_{10}	<0.5% change predicted at all receptor locations				Negligible
$PM_{2.5}$	<0.5% change predicted at all receptor locations				Negligible

Note: Results are reported to the nearest 0.1µg/m^3. Any discrepancies are due to rounding.

9.2 No existing receptors are expected to experience pollutant concentrations in excess of the relevant annual mean AQOs. Furthermore, the impact at all receptor locations is considered 'Negligible' in accordance with LUPDC. As such, the overall effect of the proposed development is considered 'not significant' with regard to air quality.

Summary

9.3 Based on the extent of predicted population exposure to NO_2, PM_{10} and $PM_{2.5}$ impacts, the overall effect of the development is considered not significant, with regard to air quality. Accordingly, there is no requirement for operational phase mitigation.

9.4 Nevertheless, the development will include various measures to minimise emissions to air during its operation, including a range of Travel Plan measures, which will encourage the transition to sustainable, low emission forms of transport, as recommended in the AQTPG.

10. CONCLUSIONS

10.1 Cass Allen was instructed by Kier Ventures Ltd to assess the potential air quality impact of a proposed residential development at Land North of Thaxted Road, Saffron Walden in Essex.

10.2 The assessment was carried out in accordance with relevant local and national planning policy and guidance.

10.3 Emissions of construction phase dust and PM_{10} were assessed in accordance with IAQM guidance. A Low Risk of both dust soiling and PM_{10} health effects has been identified, in the absence of mitigation. Suitable best practice mitigation measures have been recommended and no significant residual air quality impacts are expected.

10.4 A detailed atmospheric dispersion model was utilised to predict NO_2, PM_{10} and $PM_{2.5}$ concentrations at relevant sensitive receptor locations within the study area during the operational phase. This followed Defra TG22 and EPUK &IAQM LUPDC guidance.

10.5 The results indicate that pollutant concentrations at proposed sensitive receptors are expected to be below the relevant AQOs during the operational phase. Furthermore, no significant impacts on local air quality as a result of development-generated traffic are anticipated. Based on the extent of predicted population exposure to NO_2, PM_{10} and $PM_{2.5}$ impacts, the overall effect of the development is considered to be 'not significant', with regard to air quality, with no requirement for additional mitigation.

10.6 In summary, it is our view that the site is suitable for the development in terms of air quality and that there are no air quality constraints with respect to planning consent.

Appendix 1 Air Quality Legislation and Policy

Legislation

Defra and the Devolved Administrations (2007) – The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2):

The Air Quality Strategy provides a framework for reducing air pollution in the UK, with the aim of meeting the requirements of European Union (EU) legislation. This has been brought into UK law via the EU (Withdrawal) Act 2018 (as amended) and is referred to as 'retained EU law'.

The air quality standards set within the Air Quality Strategy are recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO), based on current scientific knowledge regarding the effects of each pollutant on health and the environment.

The AQOs are medium-term policy-based targets set by the government, taking into account economic efficiency, practicability, feasibility and timescales. Whilst some of the AQOs correspond with the EPAQS / WHO limits, others have a margin of tolerance, by specifying a number of permitted exceedances of the standard over a given period.

Many of the AQOs in the Air Quality Strategy have been made statutory in England via The Air Quality (England) Regulations, 2000,The Air Quality (England) Amendment Regulations, 2002 and The Air Quality Standards (Amendment) Regulations, 2016 – Statutory Instrument 2016 No. 1184.

Environmental Protection Act (1990):

Section 79 of the Environmental Protection Act 1990 defines statutory nuisance relevant to dust and particles as:

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

Furthermore, Section 80 states that where a statutory nuisance is shown to exist, the Local Authority must serve an abatement notice. Failure to comply with an abatement notice is an offence and if necessary, the Local Authority may abate the nuisance and recover expenses. However, there are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist and nuisance is a subjective concept, its perception being highly dependent upon the existing conditions and the change which has occurred.

Environment Act (2021):

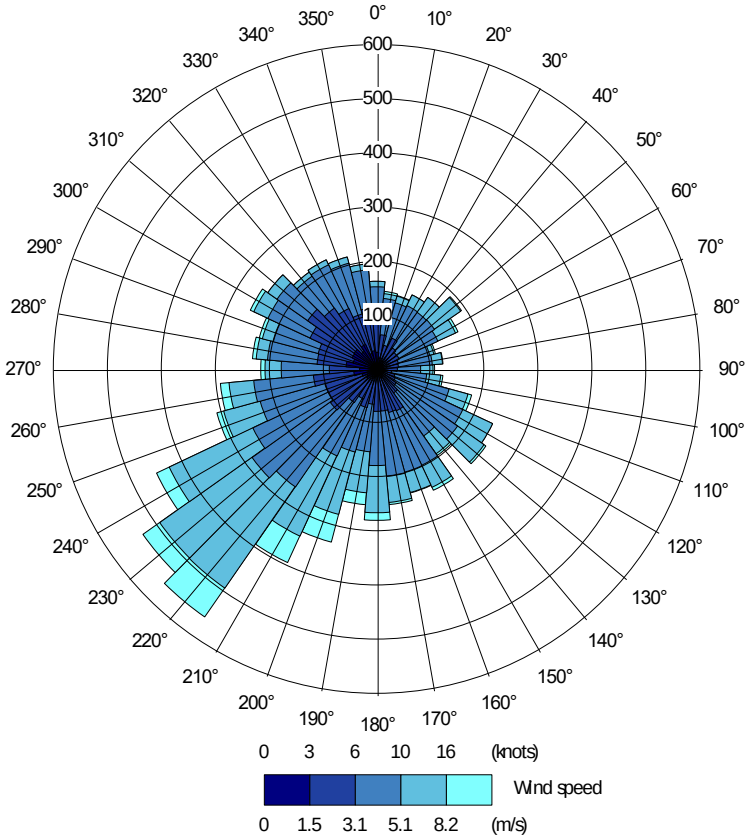
The Act mandates that local authorities review and document local air quality within their jurisdiction by way of staged appraisals and respond accordingly, with the aim of meeting the AQOs defined in the Regulations. There is a requirement for local authorities to identify relevant sources of emissions that are likely to be responsible for any failure to achieve the AQOs, or to identify relevant sources within neighbouring authorities' areas. Where the objective(s) are not likely to be achieved within the relevant period(s), the authority is required to designate an AQMA. For each AQMA the Local Authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality, in order to work towards achieving air quality standards in the future.

Defra (2019) Clean Air Strategy:

The UK Government's Clean Air Strategy sets out the comprehensive actions required to improve air quality, required from all parts of government and society.

The primary focus of previous iterations of the Clean Air Strategy has been NO_2, and its principal source – road traffic. The 2019 Strategy broadens the focus into other areas, including actions on clean growth and pollutant emissions from other sources such as industry, agriculture, and domestic wood-burning stoves.

Appendix 2 Wind Rose for Stansted (2022)



Appendix 3 Traffic Data

Traffic data for the dispersion model were obtained from the project's Transport Consultant. Flows for future scenarios included traffic growth associated with cumulative developments in the vicinity of the site. To be robust, the data assumed that the Southern Link Road (SLR), proposed to the north of the site, does not exist. This road is expected to reduce the anticipated change in traffic flows associated with the development on a number of road links in the town.

2022 Model Verification

Link ID	Description	Road Type	Speed (km/h)	AADT	%HDV
1	Site Traffic	England (rural)	-	-	-
2	Knight Park	England (rural)	15	3,906	1.25
3	Thaxted Rd, south of Knight Pk access	England (rural)	30	4,616	2.25
4	Thaxted Rd, north of Knight Pk access	England (rural)	30	6,566	2.14
5	Thaxted Rd, Knight Pk to Cardamon Rd	England (rural)	50	6,566	2.14
6	Thaxted Rd at Cardamon Rd, Jn	England (rural)	20	6,566	2.14
7	Thaxted Rd, north of Cardamon Rd	England (rural)	50	6,566	2.14
8	Thaxted Rd, south of Peasalands Rd, jn	England (rural)	20	6,566	2.14
9	Peaslands Rd, approaching Thaxted Rd	England (rural)	15	9,072	2.63
10	Peaslands Rd, Thaxted Rd to Hop Fields	England (rural)	30	9,072	2.63
11	Peaslands Rd, Hop Fields jn	England (rural)	15	9,072	2.63
12	Peasalnds Rd, Hop Fields to South Rd	England (rural)	30	9,072	2.63
13	Peaslands Rd, South Rd jn	England (rural)	15	9,072	2.63
14	Mount Pleasant Rd	England (rural)	30	9,072	2.63
15	Thaxted Rd, north of Peasalands Rd, jn	England (rural)	20	9,372	2.22
16	Thaxted Rd, Peasalands Rd to B1053	England (rural)	40	9,372	2.22
17	Thaxted Rd, south of B1053, jn	England (rural)	5	8,534	2.87
18	B1053 east of Thaxted Rd, jn	England (rural)	5	12,110	3.23
19	B1053 Thaxted Rd to Elizabeth Wy	England (rural)	35	12,110	3.23
20	B1053 west of Elizabeth Wy, jn	England (rural)	15	12,110	3.23
21	East St, west of Thaxted Rd, jn	England (rural)	5	9,567	3.32
22	East St, west of Audley Rd	England (rural)	30	9,531	3.01
23	Audley Rd	England (rural)	30	9,323	2.95

2028 Without Development

Link ID	Description	Speed (km/h)	AADT	%HDV
1	Site Traffic	-	-	-
2	Knight Park	15	4,010	1.25
3	Thaxted Rd, south of Knight Pk access	30	5,520	1.93
4	Thaxted Rd, north of Knight Pk access	30	7,522	1.92
5	Thaxted Rd, Knight Pk to Cardamon Rd	50	7,522	1.92
6	Thaxted Rd at Cardamon Rd, Jn	20	7,522	1.92
7	Thaxted Rd, north of Cardamon Rd	50	7,522	1.92
8	Thaxted Rd, south of Peasalands Rd, jn	20	7,522	1.92
9	Peaslands Rd, approaching Thaxted Rd	15	11,121	2.20
10	Peaslands Rd, Thaxted Rd to Hop Fields	30	11,121	2.20
11	Peaslands Rd, Hop Fields jn	15	11,121	2.20
12	Peasalnds Rd, Hop Ffields to South Rd	30	11,121	2.20
13	Peaslands Rd, South Rd jn	15	11,121	2.20
14	Mount Pleasant Rd	30	11,121	2.20
15	Thaxted Rd, north of Peasalands Rd, jn	20	11,514	1.85
16	Thaxted Rd, Peasalands Rd to B1053	40	11,514	1.85
17	Thaxted Rd, south of B1053, jn	5	10,404	2.41
18	B1053 east of Thaxted Rd, jn	5	14,019	2.86
19	B1053 Thaxted Rd to Elizabeth Wy	35	14,019	2.86
20	B1053 west of Elizabeth Wy, jn	15	14,019	2.86
21	East St, west of Thaxted Rd, jn	5	11,274	2.89
22	East St, west of Audley Rd	30	10,675	2.76
23	Audley Rd	30	10,387	2.72

2028 With Development

Link ID	Description	Speed (km/h)	AADT	%HDV
1	Site Traffic	15	391	0.00
2	Knight Park	15	4,402	1.14
3	Thaxted Rd, south of Knight Pk access	30	5,569	1.91
4	Thaxted Rd, north of Knight Pk access	30	7,864	1.83
5	Thaxted Rd, Knight Pk to Cardamon Rd	50	7,864	1.83
6	Thaxted Rd at Cardamon Rd, Jn	20	7,864	1.83
7	Thaxted Rd, north of Cardamon Rd	50	7,864	1.83
8	Thaxted Rd, south of Peasalands Rd, jn	20	7,864	1.83
9	Peaslands Rd, approaching Thaxted Rd	15	11,298	2.17
10	Peaslands Rd, Thaxted Rd to Hop Fields	30	11,298	2.17
11	Peaslands Rd, Hop Fields jn	15	11,298	2.17
12	Peasalnds Rd, Hop Fields to South Rd	30	11,298	2.17
13	Peaslands Rd, South Rd jn	15	11,298	2.17
14	Mount Pleasant Rd	30	11,298	2.17
15	Thaxted Rd, north of Peasalands Rd, jn	20	11,679	1.83
16	Thaxted Rd, Peasalands Rd to B1053	40	11,679	1.83
17	Thaxted Rd, south of B1053, jn	5	10,569	2.37
18	B1053 east of Thaxted Rd, jn	5	14,050	2.86
19	B1053 Thaxted Rd to Elizabeth Wy	35	14,050	2.86
20	B1053 west of Elizabeth Wy, jn	15	14,050	2.86
21	East St, west of Thaxted Rd, jn	5	11,408	2.86
22	East St, west of Audley Rd	30	10,736	2.75
23	Audley Rd	30	10,460	2.70

Appendix 4 Dispersion Model Details

Model Details and Input Parameters

Parameter	Value
Emissions Factors	From Defra Emissions Factors Toolkit v11.0 using the traffic data in Appendix 3
Emissions Year	2022 for verification, 2028 for future scenarios
Background Concentrations	Sources from Defra maps – 2022 for verification, 2028 for future scenarios
Surface Roughness	Site – 0.5m; Meteorological Station – 0.3m
Monin-Obukhov Length	Site – 10m; Meteorological Station – 10m
Meteorological Data	Stansted 2022
Road-contribution Adjustment Factor	1.78 – see Model Verification, below
NO_x to NO_2 conversion	Defra NO_x to NO_2 Calculator v8.1 and Defra mapped background concentrations
Street Canyon	None included in model.
Gradient	None included in model.

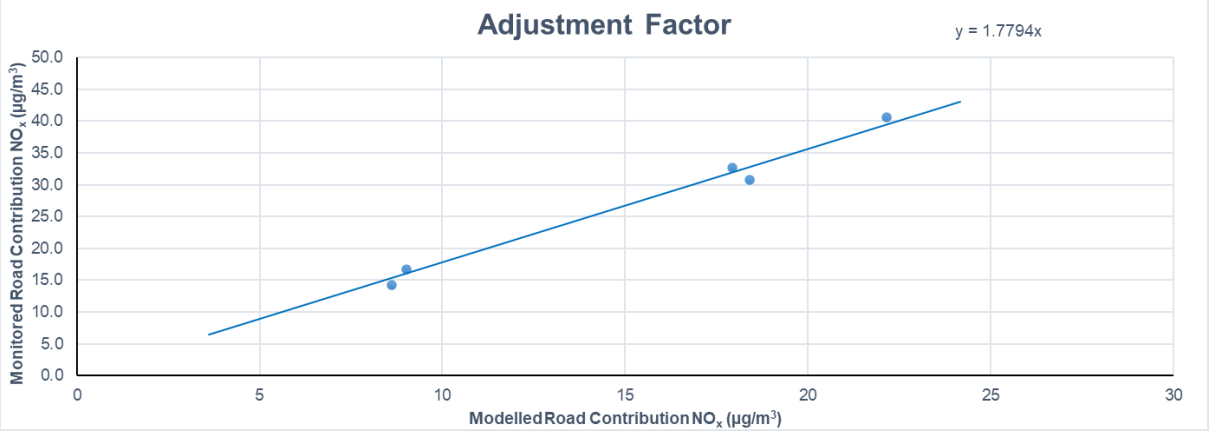
Model Verification

The model has been verified using the TG22 methodology. The model has been used to predict 2022 annual mean road-NO_x contributions at roadside and kerbside monitoring locations within the study area. The modelled road-NO_x concentrations have been compared with the 'measured' road-NO_x utilising the Defra NO_x to NO_2 Calculator.

Model Verification (all concentrations in µg/m³)

Monitor ID	2022 Monitored NO_2	2022 background NO_2	2022 Monitored Road NO_x	2022 Modelled Road NO_x	Ratio
UTT2	30.9	10.2	40.7	22.2	1.835
UT005	27.1	10.2	32.7	17.9	1.820
UT016	26.2	10.2	30.8	18.4	1.674
UT021	19.1	10.2	16.6	9.0	1.844
UT031	16.2	8.5	14.2	8.6	1.646

Comparison of Measured Road-NO_x with Modelled Road NO_x



Calculation of Model Uncertainty

To assess model uncertainty, the Root Mean Square Error (RMSE) of the above data was calculated to provide an estimate of the average error of the model. The overall weighted RMSE value calculated following model verification was 0.6µg/m³, which is within the acceptable range specified in TG22.

Appendix 5 Operational Phase Significance Criteria

Long Term Average Concentration at Receptors in Assessment Year	% Change in Concentration Relative to Air Quality Objective (AQO)			
	1	2 – 5	6 – 10	>10
75% or less of AQO	Negligible	Negligible	Slight	Moderate
76 - 94% of AQO	Negligible	Slight	Moderate	Moderate
95 - 102% of AQO	Slight	Moderate	Moderate	Substantial
103 - 109% of AQO	Moderate	Moderate	Substantial	Substantial
110% or more of AQO	Moderate	Substantial	Substantial	Substantial

Notes:

- The Table is intended to be used by rounding the change in percentage pollutant concentration to whole numbers, which then makes it clearer which cell the impact falls within. The user is encouraged to treat the numbers with recognition of their likely accuracy and not assume a false level of precision. Changes of 0%, i.e. less than 0.5%, will be described as Negligible.
- The Table is only designed to be used with annual mean concentrations.
- Descriptors for individual receptors only; the overall significance is determined using professional judgement. For example, a 'moderate' adverse impact at one receptor may not mean that the overall impact has a significant effect. Other factors need to be considered.
- When defining the concentration as a percentage of the AQO, use the 'without scheme' concentration where there is a decrease in pollutant concentration and the 'with scheme' concentration for an increase.
- The total concentration categories reflect the degree of potential harm by reference to the AQO value. At exposure less than 75% of this value, i.e. 'well below', the degree of harm is likely to be small. As the exposure approaches and exceeds the AQO, the degree of harm increases. This change naturally becomes more important when the result is an exposure that is approximately equal to, or greater than the AQO.
- It is unwise to ascribe too much accuracy to incremental changes or background concentrations, and this is especially important when total concentrations are close to the AQO. For a given year in the future, it is impossible to define the new total concentration without recognising the inherent uncertainty, which is why there is a category that has a range around the AQO, rather than being exactly equal to it.
- When defining the concentration as a percentage of the AQO, 'without scheme' concentration should be used where there is a decrease in pollutant concentration and the 'with scheme;' concentration where there is an increase. Where concentrations increase, the impact is described as adverse, and where it decreases as beneficial.
- LUPDC states that an assessment must reach a conclusion on the likely significance of the predicted effect. It should be noted that this is a binary judgement of either it is significant, or it is not significant.

Appendix 6 Recommended Construction Phase Mitigation

IAQM highly recommended mitigation measures for Low Risk sites:

General Communication

- 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. The head or regional office contact information should also be displayed.
- Display the head or regional office contact information, where applicable.

Site Management

- Record all dust and air quality complaints, identify cause(s), take appropriate measures to reduce emissions in a timely manner and record the measures taken.
- Make complaints log available to the Local Authority on request.
- Record any exceptional incidents that cause dust and/or air emissions, either on or off-site should be recorded, and the action taken to resolve the situation, in the logbook.

Monitoring

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

Preparing and Maintaining the Site

- Plan the site layout so that machinery and dust causing activities are located away from receptors, as far as is practicable.
- Erect solid screens or barriers around dusty activities or the site boundary that are at least as high as any stockpiles on-site.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.

Operating Vehicle/Machinery and Sustainable Travel

- Ensure all vehicle operators switch off engines when stationary – no idling vehicles.
- Avoid the use of diesel or petrol powered generators and use mains electricity or battery powered equipment where practicable.
- Produce a Construction Logistics Plan to manage the sustainable delivery of goods and materials.

Operations

- Only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, e.g. suitable local exhaust ventilation systems.
- Ensure an adequate water supply is available on the site for effective dust/PM suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes/conveyors and covered skips.
- Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate.

Waste Management

- Avoid bonfires and burning of waste materials.

Appendix 7 Dispersion Model Results (Existing/Future Receptors)

Annual Mean NO_2 Impacts

Receptor	Without (µg/m³)	With (µg/m³)	With % of AQO	Change (µg/m³)	Change (% AQO)	Impact Descriptor
FR1	8.6	8.6	21.5	0.0	0.1	Negligible
FR2	8.6	8.7	21.7	0.1	0.2	Negligible
ER1	8.9	9.0	22.5	0.1	0.2	Negligible
ER2	9.6	9.7	24.2	0.1	0.2	Negligible
ER3	11.3	11.4	28.4	0.1	0.1	Negligible
ER4	10.2	10.2	25.6	0.1	0.1	Negligible
ER5	11.0	11.1	27.7	0.1	0.2	Negligible
ER6	11.5	11.5	28.9	0.0	0.1	Negligible
ER7	14.6	14.6	36.6	0.1	0.1	Negligible
ER8	20.2	20.3	50.7	0.1	0.2	Negligible
ER9	19.6	19.7	49.2	0.1	0.2	Negligible
ER10	16.9	17.0	42.4	0.1	0.2	Negligible
ER11	15.9	16.0	40.0	0.0	0.1	Negligible
ER12	14.9	15.0	37.4	0.0	0.1	Negligible
ER13	12.4	12.4	30.9	0.0	0.0	Negligible
ER14	13.9	13.9	34.8	0.0	0.1	Negligible
ER15	18.6	18.6	46.5	0.1	0.1	Negligible
ER16	19.5	19.6	48.9	0.0	0.1	Negligible

Note: Results are reported to the nearest 0.1µg/m³. Any discrepancies are due to rounding.

Annual Mean PM_{10} Impacts

Receptor	Without (µg/m³)	With (µg/m³)	With % of AQO	Change (µg/m³)	Change (% AQO)	Impact Descriptor
FR1	14.7	14.7	36.8	0.0	0.0	Negligible
FR2	14.8	14.8	37.0	0.0	0.0	Negligible
ER1	14.9	14.9	37.3	0.0	0.1	Negligible
ER2	15.1	15.1	37.7	0.0	0.1	Negligible
ER3	15.4	15.4	38.4	0.0	0.0	Negligible
ER4	15.1	15.1	37.8	0.0	0.0	Negligible
ER5	15.3	15.3	38.3	0.0	0.0	Negligible
ER6	14.6	14.6	36.6	0.0	0.0	Negligible
ER7	14.6	14.6	36.6	0.0	0.0	Negligible
ER8	15.4	15.5	38.6	0.0	0.1	Negligible
ER9	15.2	15.2	38.1	0.0	0.0	Negligible

Receptor	Without (µg/m³)	With (µg/m³)	With % of AQO	Change (µg/m³)	Change (% AQO)	Impact Descriptor
ER10	14.9	14.9	37.2	0.0	0.0	Negligible
ER11	15.8	15.8	39.4	0.0	0.0	Negligible
ER12	15.2	15.2	38.1	0.0	0.0	Negligible
ER13	14.7	14.7	36.9	0.0	0.0	Negligible
ER14	15.2	15.2	38.0	0.0	0.0	Negligible
ER15	15.1	15.1	37.7	0.0	0.0	Negligible
ER16	15.2	15.2	38.0	0.0	0.0	Negligible

Note: Results are reported to the nearest 0.1µg/m³. Any discrepancies are due to rounding.

Annual Mean $PM_{2.5}$ Impacts

Receptor	Without (µg/m³)	With (µg/m³)	With % of AQO	Change (µg/m³)	Change (% AQO)	Impact Descriptor
FR1	9.0	9.1	45.3	0.0	0.0	Negligible
FR2	9.1	9.1	45.5	0.0	0.1	Negligible
ER1	9.2	9.2	45.8	0.0	0.1	Negligible
ER2	9.3	9.3	46.4	0.0	0.1	Negligible
ER3	9.4	9.5	47.3	0.0	0.1	Negligible
ER4	9.3	9.3	46.6	0.0	0.0	Negligible
ER5	9.4	9.4	47.1	0.0	0.1	Negligible
ER6	9.3	9.3	46.6	0.0	0.0	Negligible
ER7	9.3	9.3	46.7	0.0	0.0	Negligible
ER8	9.8	9.8	49.2	0.0	0.1	Negligible
ER9	9.7	9.7	48.5	0.0	0.0	Negligible
ER10	9.5	9.5	47.5	0.0	0.0	Negligible
ER11	10.0	10.0	50.0	0.0	0.0	Negligible
ER12	9.7	9.7	48.4	0.0	0.0	Negligible
ER13	9.4	9.4	46.9	0.0	0.0	Negligible
ER14	9.7	9.7	48.3	0.0	0.0	Negligible
ER15	9.6	9.6	48.1	0.0	0.0	Negligible
ER16	9.7	9.7	48.4	0.0	0.0	Negligible

Note: Results are reported to the nearest 0.1µg/m³. Any discrepancies are due to rounding.

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