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Air Quality Assessment

Downlands Farm, Uckfield

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Air Quality Assessment

Project: DOWNLANDS FARM, UCKFIELD

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1. EXECUTIVE SUMMARY

1.1 Cass Allen has been instructed by Gleeson Land Ltd to assess the potential air quality impact of a proposed new residential development at Downlands Farm, Uckfield in East Sussex.

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

1.3 Air quality in the vicinity is primarily influenced by vehicle emissions on the A22 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 medium and low risk of dust soiling and PM_{10} health effects has been identified, respectively, 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 nitrogen dioxide (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) and IAQM guidance.

1.6 The results indicate that pollutant concentrations at proposed sensitive receptors will be below the relevant Air Quality Objectives (AQOs) during the operational phase. Furthermore, no significant impacts on local air quality as a result of development-generated traffic are anticipated, with no requirement for additional mitigation.

1.7 It is our view therefore, 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 Gleeson Land Ltd to assess the potential air quality impact of a proposed new residential development at Downlands Farm, Uckfield in East Sussex.

2.2 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.

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

2.4 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

3. PROJECT DESCRIPTION AND SITE CONTEXT

3.1 The Site is located north-west of Uckfield, between the A22 to the west and a residential area to the east. The site location is shown on the current illustrative masterplan in Figure 1 below.

Figure 1 Site Location and Surrounding Area



3.2 The proposal (planning reference: WD/2022/1637/MEA) includes a hybrid planning application, comprising outline planning for the erection of up to 424 residential dwellings including affordable housing, the provision of vehicular, pedestrian and cycle access and separate emergency access from the Uckfield Bypass (A22), pedestrian and cycle access from Snatts Road, open spaces including children's play space, sustainable urban drainage systems, associated landscaping, infrastructure and earthworks; and full application comprising creation of a strategic Suitable Alternative Natural Greenspace (SANG), associated landscaping and car parking, demolition of existing residential property and other buildings, and provision of pedestrian and cycle access from Rocks Road, associated landscaping, infrastructure and earthworks.

3.3 With regard to air quality, the site is not located close to any existing Air Quality Management Areas (AQMA), and there are currently none in Wealden District. Air quality in the vicinity is primarily influenced by vehicle emissions on the A22, the A26 and the local road network.

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. The national air quality objectives (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	Measured As
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 It should be noted that the above AQOs are normally only applicable where there is 'relevant exposure', i.e. where members of the public are likely to be present for the relevant averaging periods, and not usually 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). 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 Wealden District Council's District Core Strategy Local Plan (February 2013) and saved policies from the Adopted Wealden Local Plan (1998) also apply to the proposed development. We have reviewed these and the air quality requirements are consistent with the requirements of the NPPF as set out above.

4.6 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 and IAQM, Land Use Planning & Development Control: Planning for Air Quality, January 2017 (LUPDC), and the Sussex Air Quality Partnership (SAQP) Air Quality and Emissions Mitigation Guidance for Sussex, 2021. Reference has also been made to other relevant technical guidance, where applicable.

Construction Phase

5.2 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, June 2016, 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 350m of the site boundary, and/or within 50m of a route used by construction vehicles, up to 500m 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 Gatwick meteorological station is included in Appendix 2. This is the closest station for which suitable data were available, and has been used for other major applications in the vicinity.
- Step 2C – define the risk of impacts.
- Step 3 – identify site-specific mitigation requirements.

5.3 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

5.4 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.

5.5 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' (CERCs') ADMS-Roads (version 5.0.1.3) atmospheric dispersion model has been used to predict pollutant concentrations at the proposed and existing receptor locations detailed in Table 2.

Table 2 Modelled Receptor Locations (see Figure 2)

ID	Description	Grid Reference (OSGB)	Height (m)
R1	New dwelling south of Maresfield	546171.2, 123580.1	1.5
R2	House west of Budlett's Roundabout	547031.5, 123509.9	1.5
R3	House in Budlett's Common	547170.0, 123457.2	1.5
R4	House at Ringles Cross	547599.5, 122651.7	1.5
R5	House west of Copwood Roundabout	546059.9, 121045.9	1.5
R6	House on Batchelor Way	546271.4, 120999.4	1.5
PR1	Proposed receptors to west of site	546339.2, 121938.1	1.5
PR2		546373.5, 122050.3	1.5
PR3		546459.4, 122179.7	1.5
PR4		546522.1, 122305.2	1.5
PR5		546562.0, 122434.4	1.5

Note: Proposed receptors may not represent the position of actual dwellings within the site, but are at worst-case locations with respect to the A22.

5.6 Potential air quality impacts on ecological receptors were excluded by the project ecologist (Aspect Ecology Technical Note TN09, 25 November 2022) and are not considered further in this assessment.

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

- 2019 – Model Verification;
- 2026 – Assumed Opening Year, Without Development; and
- 2026 – Assumed Opening Year, With Development.

5.8 2019 has been used as the model verification year, in line with IAQM guidance, as 2021 and 2022 air quality monitoring data collection, and traffic flows., will have been affected by the COVID-19 travel restrictions. The 2026 scenarios incorporated robust 2039 East Sussex County Council modelled traffic data provided the project's Transport Consultant.

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

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

Significance Criteria

5.11 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).

5.12 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.

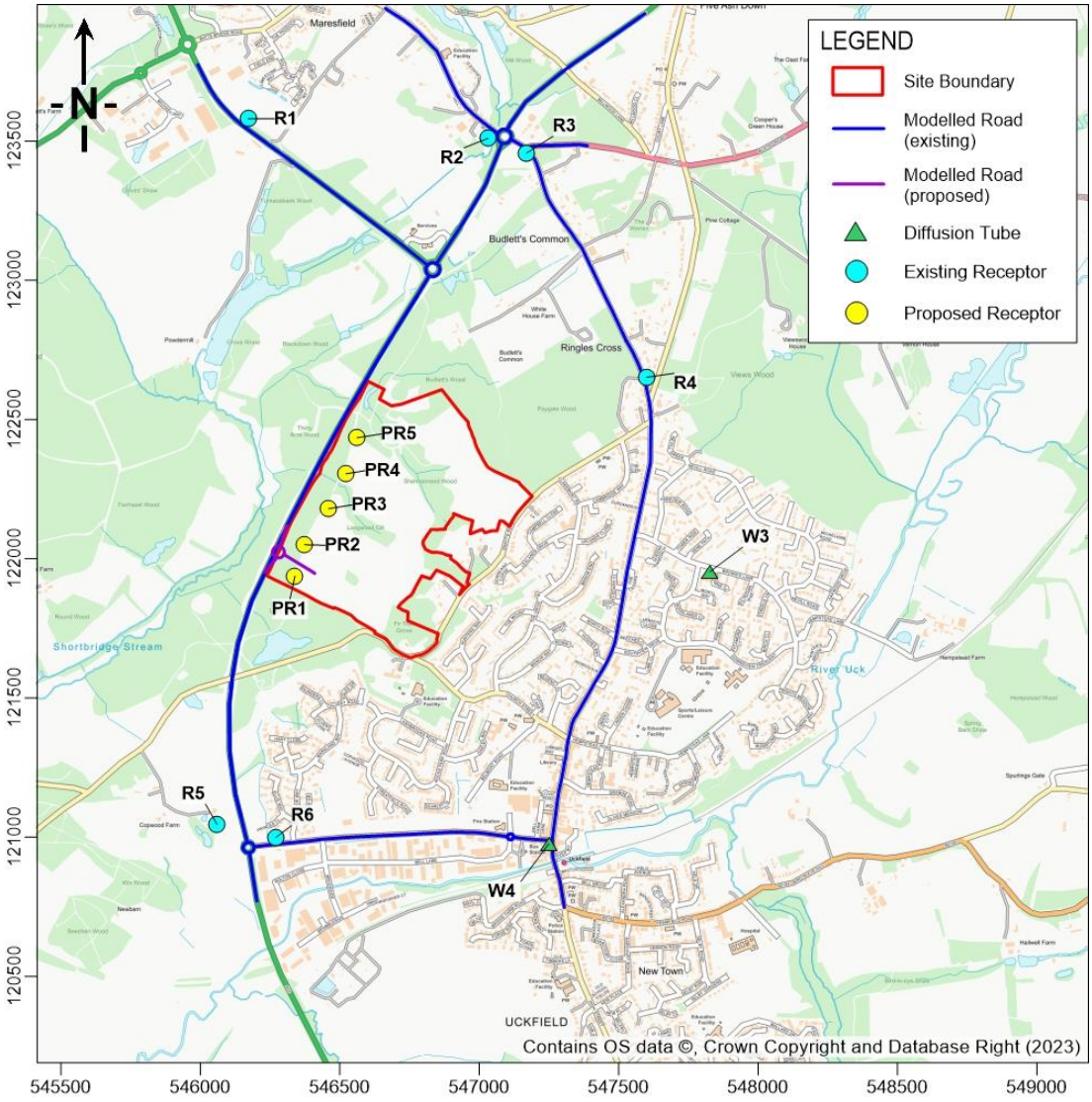
5.13 The LUPDC significance criteria applicable to the assessment of impacts at existing receptors are included in Appendix 5. It should be noted that, in line with LUPDC, *'the criteria should not be applied rigidly; in some instances, it may be appropriate to amend them on the basis of professional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

Emissions Cost Calculation

5.14 For 'Major' proposals, including development of 10 or more dwellings, the SAQP guidance requires an emissions cost calculation to identify the environmental 'damage' costs associated with the proposal and determine the amount (value) of mitigation (including intrinsic mitigation) that is appropriate to offset this cost. This has been undertaken following the Defra Interdepartmental Group on Costs and Benefits (IGCB) approach, utilising the following calculation:

- Cost of Road Transport Emission Increase = ∑ [Estimated trip rate for 5 years × Emission rate per 10km per vehicle type × Damage Costs]

Figure 2 Dispersion Model Extents



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, for the monitoring locations indicated on Figure 2.

Table 3 Wealden District Council Monitored Concentrations – NO_2

ID	Location	Type	Distance to site (m)	Monitored Annual Mean (µg/m³)				
				2017	2018	2019	2020	2021
W3	Uckfield Background	Urban Background	690	15.6	14.9	13.4	12.1	11.2
W4	Uckfield Town Centre	Roadside	810	37.1	36.7	33.6	23.0	25.0

Note: Data obtained from Wealden District Council 2022 Air Quality Annual Status Report.

Table 4 Defra Mapped Background Concentrations

OS Grid Reference	2019 (verification year)				2026 (opening year)			
	NO_2	NO_x	PM_{10}	$PM_{2.5}$	NO_2	NO_x	PM_{10}	$PM_{2.5}$
546500, 123500	8.8	11.4	13.5	9.1	6.7	8.5	12.4	8.2
547500, 123500	8.6	11.1	13.4	9.0	6.6	8.4	12.3	8.1
547500, 122500	8.3	10.8	13.6	9.3	6.5	8.3	12.5	8.4
546500, 121500	9.3	12.1	14.0	9.5	7.1	9.1	12.9	8.6
546500, 120500	9.9	13.0	14.8	9.5	7.7	10.0	13.7	8.6
546500, 122500 (site)	8.5	11.0	13.4	9.0	6.5	8.3	12.3	8.1

Note: Data obtained from https://uk-air.defra.gov.uk/data/laqm-background-home.

6.2 Whilst it should be noted that pollutant concentrations in 2020 and 2021 are likely to have been reduced as a result of COVID-19 travel restrictions, the data in Table 3 indicate that no exceedances of the 40µg/m³ NO_2 AQO were recorded in 2017-2021 at either of the monitoring locations in Uckfield. Defra predicted background concentrations for NO_2, PM_{10} and $PM_{2.5}$ for 2019 and 2026 are also below 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	Small	Minor demolition works proposed, including one existing dwelling.
Earthworks	Large	Total site area >10,000m^2, >10 heavy earth moving vehicles assumed.
Construction	Large	Total building volume >100,000m^3, potentially dusty construction materials.
Trackout	Large	Potential for >50 outward HDV movements on a single day and >100m unpaved road length.

Table 6 Step 2B – Sensitivity of the Area

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

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

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

7.3 Overall, the development is considered to be Medium Risk for dust soiling effects and Low Risk for PM_{10} health effects, in the absence of mitigation. Following implementation of the recommended mitigation measures for medium 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 LUPDC screening criteria detailed in paragraph 5.4, 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 worst-case proposed receptors are detailed in Table 8.

Table 8 Predicted Pollutant Concentrations at the Development in 2026

Receptor	Annual Mean Concentration (µg/m^3)		
	NO_2	PM_{10}	$PM_{2.5}$
PR1	9.9	13.8	9.1
PR2	10.5	13.5	8.8
PR3	9.0	13.2	8.6
PR4	8.8	13.2	8.6
PR5	9.3	13.4	8.7

8.2 The data in Table 8 show that pollutant concentrations were predicted to be well below (i.e. less than 75% of) the relevant annual AQOs at all proposed receptor locations.

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 and therefore, the site is considered to be 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 receptor locations, 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 2026

Pollutant	Receptor	Annual Mean Concentration (µg/m³)			Impact Descriptor
		Without 2026	With 2026	Change	
Highest Absolute Concentrations					
NO_2	R6	15.4	15.5	0.1	Negligible
PM_{10}	R6	16.0 (16.05)	16.1 (16.08)	0.0 (0.03)	Negligible
$PM_{2.5}$	R6	9.9	9.9	0.0	Negligible
Maximum Predicted Changes					
NO_2	R4	12.3 (12.26)	12.5 (12.52)	0.3 (0.26)	Negligible
PM_{10}	<0.1 (<0.5% of AQO) at all receptor locations				Negligible
$PM_{2.5}$	<0.1 (<0.5% of AQO) at all receptor locations				Negligible

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. Accordingly, the overall effect of the proposed development is considered to be '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 to be not significant, with regard to air quality.

10. EMISSIONS COST CALCULATION

10.1 The inputs to the emissions cost calculation are shown in Table 10.

Table 10 Emissions Cost Calculation Inputs

Input	Value
Development trip rate	1,882 AADT (1% HDV assumed)
Average speed	50 km/hr
Emissions year	2026
Area / road type	England (not London) - Urban (not London)
Defra road transport cost per tonne ('urban medium') from updated 2023 damage costs	NO_x: £9,054
	$PM_{2.5}$: £63,766
Development vehicle emissions from EFT (Defra Emissions Factors Toolkit v11.0)	NO_x: 1.060 tonnes/year
	$PM_{2.5}$: 0.123 tonnes/year

10.2 The inputs to the emissions cost calculation are shown in Table 11, which includes the 2% uplift per year specified in the IBC guidance, *'to reflect a higher willingness to pay for health'*.

Table 11 Emissions Cost Calculation Inputs

Emissions Year	Calculated Cost by Pollutant	
	NO_x	**$PM_{2.5}$**
2026	£9,592.71	£7,811.34
2027	£9,784.57	£7,967.56
2028	£9,980.26	£8,126.91
2029	£10,179.86	£8,289.45
2030	£10,383.46	£8,455.24
Total Cost		**£90,571.36**

10.3 The calculated emissions cost value in **Table 11** gives an indication of the potential cost of the development to local air quality over a 5-year period. However, the development will include extensive measures intended to encourage the transition to more sustainable transport options and, therefore, minimise emissions during its operation. These will include Travel Plan measures (see Motion, Framework Travel Plan, 2022), such as:

- Permeability for active travel modes, including new and improved pedestrian and cycle connections to the rest of Uckfield;
- Provision for public transport, including a new community bus service connecting the development to key locations in the town;

- On-site cycle parking;
- Electric vehicle charging points;
- Car Club infrastructure; and
- Travel Information Pack for residents.

10.4 A Travel Plan Coordinator will be appointed to deliver the Travel Plan measures and monitor progress.

10.5 It is anticipated that further measures would be confirmed at reserved matters stage. However, it is our view that the proposed mitigation will more than offset the calculated emissions cost, and therefore, there should be no requirement for additional mitigation measures with respect to air quality.

11. CONCLUSIONS

11.1 Cass Allen was instructed by Gleeson Land Ltd to assess the potential air quality impact of a proposed new residential development at land west of Downlands Farm, Uckfield in East Sussex.

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

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

11.4 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 operational phase. This followed Defra TG22 and EPUK and IAQM LUPDC guidance.

11.5 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, without the requirement for additional mitigation.

11.6 In summary, it is concluded that the development accords with relevant Local Plan policy criteria. 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

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):

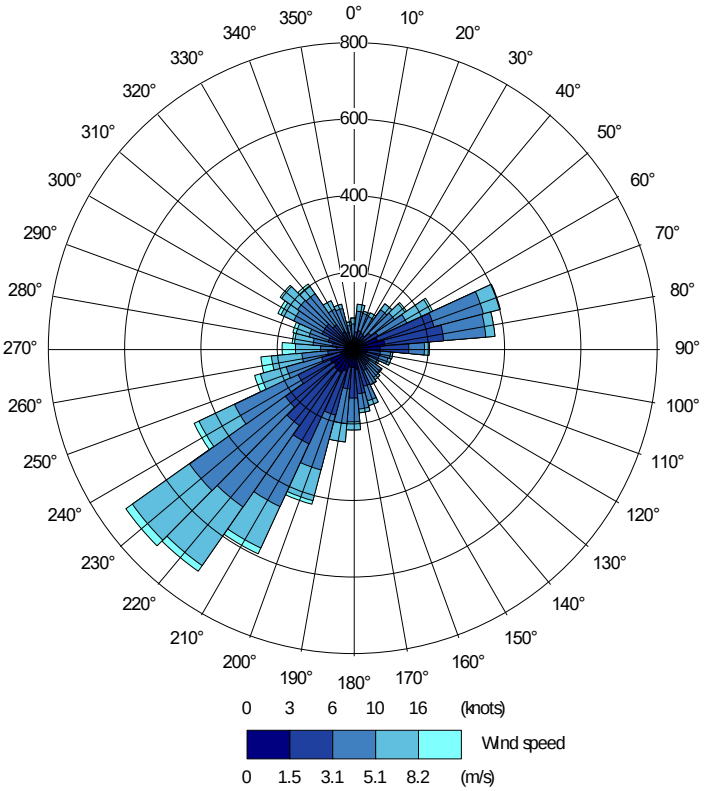
The Act mandates that local authorities review and document local air quality within their jurisdiction by way of staged appraisals and respond accordingly, with the aim of meeting the AQOs defined in the Regulations. There is a requirement for local authorities to identify relevant sources of emissions 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) Clear 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 NO2, 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 Gatwick (2019)



Appendix 3 Traffic Data

Traffic data for the dispersion model were obtained from the project's Transport Consultant and supplemented by additional data from Department for Transport (DfT) Traffic Counts (https://roadtraffic.dft.gov.uk/). Where necessary, traffic data were converted to the appropriate assessment years using a robust factor derived from Defra's Trip End Model Presentation Program (TEMPro) program (version 8.0).

It should be noted that baseline future year traffic data used for the purpose of the Transport Assessment were based on data provided by East Sussex County Council (ESCC) from the ESCC Uckfield SATURN model. This model is a dynamic model which can redistribute traffic around the network as additional traffic movements are added and this can create points where the 'net' change in trips as a result of a new development will not be significant. However, to create a more robust assessment for air quality, an alternative development trips data set was produced which did not take into account this redistribution, for the data points along the A22 corridor. The ESCC model also considered future scenarios in 2039, which were used for the 2026 scenarios detailed in this report. It is therefore considered that the the air dispersion modelling assessment traffic inputs are conservative.

2019 Model Verification

Link ID	Description	Road Type	Speed (km/h)	AADT	%HDV
1	A22 Maresfield Bypass, north	Urban (not London)	90	18,688	3.45
2	A22 Maresfield Bypass, approaching A26	Urban (not London)	30	18,688	3.45
3	A22/A26 Roundabout, Maresfield	Urban (not London)	25	16,022	3.94
4	Budlett's Roundabout	Urban (not London)	15	13,421	3.56
5	London Road / School Hill, approaching roundabout	Urban (not London)	15	7,053	2.25
6	London Road / School Hill, north	Urban (not London)	25	7,053	2.25
7	A26 north of Budlett's, approach	Urban (not London)	25	10,958	4.41
8	A26 north of Budlett's, north	Urban (not London)	90	10,958	4.41
9	A272, approaching Budlett's Roundabout	Urban (not London)	15	14,861	3.08
10	London Road, south of A272	Urban (not London)	70	8,098	2.30
11	London Road, north of Coopers Green Rd, approach	Urban (not London)	50	8,098	2.30
12	A26 south of Budlett's, approach	Urban (not London)	25	17,287	3.64
13	A26 south of Budlett's	Urban (not London)	80	17,287	3.64
14	A26 approaching A22/A26 Roundabout, Maresfield	Urban (not London)	30	17,287	3.64
15	A22 south of A22/A26 Roundabout, approach	Urban (not London)	30	24,577	4.15
16	A22 adjacent to site (EXISTING)	Urban (not London)	80	24,577	4.15
16A	A22 north of site (WITH ONLY)	Urban (not London)	-	-	-
16B	A22 south of site (WITH ONLY)	Urban (not London)	-	-	-
17	A22 north of Copwood Roundabout, approach	Urban (not London)	25	24,577	4.15
18	Copwood Roundabout	Urban (not London)	15	16,085	3.77
19	B2102 approaching Copwood Roundabout	Urban (not London)	25	12,161	2.11
20	B2102 Bellfarm Road	Urban (not London)	80	12,161	2.11
21	B2102 Bellfarm Road, west of Tesco	Urban (not London)	50	12,161	2.11
22	Tesco Roundabout	Urban (not London)	15	12,161	2.11
23	B2102 Bellfarm Road, east of Tesco	Urban (not London)	10	12,161	2.11
24	B2102, south of Bellfarm Rd	Urban (not London)	10	14,339	2.30
25	High Street approaching B2102	Urban (not London)	10	10,828	2.30
26	High Street, Uckfield	Urban (not London)	25	10,828	2.30
27	High Street south of Church St, approach	Urban (not London)	10	10,828	2.30
28	High Street north of Church St, approach	Urban (not London)	10	10,828	2.30
29	High Street south of Southview Dr	Urban (not London)	40	10,828	2.30
30	London Road, south of Snatts Rd	Urban (not London)	50	8,098	2.30
31	London Road at Snatts Rd / Coopers Green Rd	Urban (not London)	25	8,098	2.30
32	A22 south of Copwood Roundabout, approach	Urban (not London)	25	22,938	4.15
33	A272 east	Urban (not London)	15	6,763	4.02
34	Site roundabout (WITH ONLY)	Urban (not London)	-	-	-
35	Site Access	Urban (not London)	-	-	-
36	A22 north of site, approaching rndbt (WITH ONLY)	Urban (not London)	-	-	-
37	A22 south of site, approaching rndbt (WITH ONLY)	Urban (not London)	-	-	-

2026 Without and With Development

Link ID	Speed (km/h)	Without Development		With Development	
		AADT	%HDV	AADT	%HDV
1	90	20,378	3.45	20,980	3.38
2	30	20,378	3.45	20,980	3.38
3	25	17,635	3.94	18,225	3.85
4	15	14,915	3.52	15,172	3.49
5	15	8,605	2.25	8,606	2.25
6	25	8,605	2.25	8,606	2.25
7	25	12,078	4.41	12,078	4.45
8	90	12,078	4.41	12,078	4.45
9	15	16,145	3.00	16,612	2.94
10	70	9,593	2.30	10,060	2.24
11	50	9,593	2.30	10,060	2.24
12	25	19,054	3.64	19,487	3.58
13	80	19,054	3.64	19,487	3.58
14	30	19,054	3.64	19,487	3.58
15	30	27,090	4.15	28,125	4.03
16	80	27,090	4.15	-	-
16A	80	-	-	28,125	4.03
16B	80	-	-	28,032	4.05
17	25	27,185	4.15	28,032	4.05
18	15	17,548	3.81	17,983	3.74
19	25	12,167	2.11	12,272	2.10
20	80	12,167	2.11	12,272	2.10
21	50	12,167	2.11	12,272	2.10
22	15	12,167	2.11	12,272	2.10
23	10	12,167	2.11	12,272	2.10
24	10	14,935	2.30	14,935	2.30
25	10	11,494	2.30	11,517	2.30
26	25	11,494	2.30	11,517	2.30
27	10	11,494	2.30	11,517	2.30
28	10	11,494	2.30	11,517	2.30
29	40	11,494	2.30	11,517	2.30
30	50	9,593	2.30	10,060	2.24
31	25	9,593	2.30	10,060	2.24
32	25	25,585	4.15	26,056	4.09
33	15	6,552	4.02	6,552	4.02
34	15	-	-	14,942	4.02
35	10	-	-	1,882	1.00
36	20	-	-	28,125	4.03
37	20	-	-	28,032	4.05

Appendix 4 Dispersion Model Details

Model Details and Input Parameters

Parameter	Value
Emissions Factors	From Defra Emissions Factors Toolkit v11.0 using the Appendix 3 traffic data
Emissions Year	Actual year used for all scenarios
Background Concentrations	Sourced from 2018 Defra Background Maps – actual year used for all scenarios
Surface Roughness	Site – 0.5m; Meteorological Station – 0.2m
Monin-Obukhov Length	Site – 10m; Meteorological Station – 30m
Meteorological Data	Gatwick (2019)
Road-contribution Adjustment Factor	2.29 – see Model Verification, below
NO_x to NO_2 conversion	Utilised Defra NO_x to NO_2 Calculator v8.1

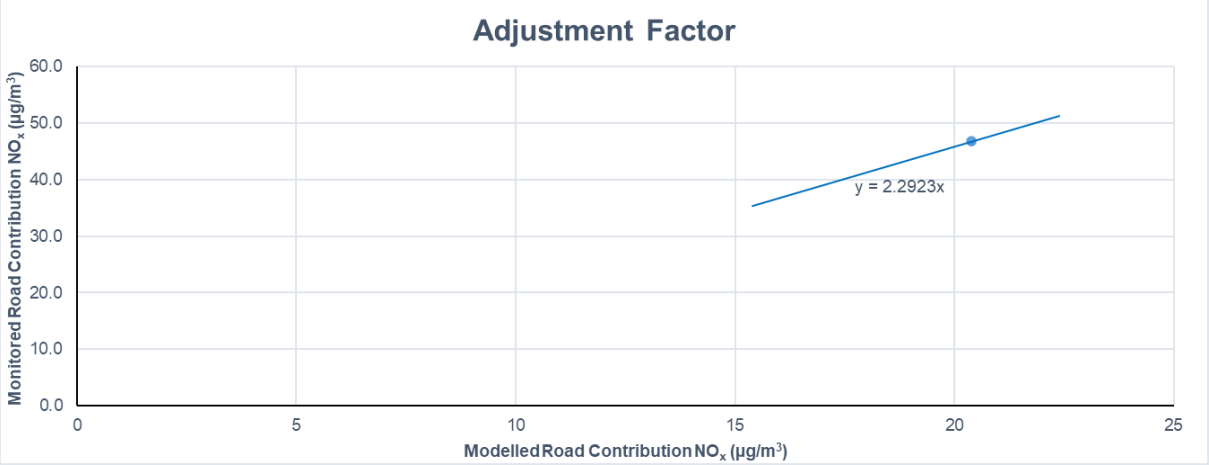
Model Verification

The model has been verified using the TG22 methodology. The model has been used to predict the 2019 annual mean road-NO_x contribution at the single roadside monitoring location within the study area. The modelled road-NO_x concentration has 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	2019 Monitored NO_2	2019 background NO_2	2019 Monitored Road NO_x	2019 Modelled Road NO_x	Ratio
S29	33.6	10.0	46.8	20.4	2.292

Comparison of Measured Road-NO_x with Modelled Road NO_x



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

Recommended Mitigation Measures for Medium Risk Sites

General Communication

- Prior to work commencing on each phase of development, the developer will inform the local community on works due to commence and a point of contact provided for construction-related queries.
- 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.
- 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 Appendix. Further, 'desirable' measures from IAQM guidance should be included as appropriate for the site. The DMP may include monitoring of dust deposition, dust flux, real-time PM_{10} continuous monitoring and/or visual inspections.

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 effectiveness of mitigation, 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.
- Fully enclose site or specific operations where there is a high potential for dust production and the site is active for an extensive period.
- Avoid site runoff of water or mud.
- Keep site fencing, barriers and scaffolding clean using wet methods.
- Remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on-site. If they are being reused on-site cover as described below.
- Cover, seed or fence stockpiles to prevent wind whipping.

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.
- 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.

Waste Management

- Avoid bonfires and burning of waste materials.

Measures Specific to Demolition

- Ensure effective water suppression is used during demolition operations. Handheld 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.
- Avoid explosive blasting, using appropriate manual or mechanical alternatives.
- Bag and remove any biological debris or damp down such material before demolition.

Measures Specific to Construction

- 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 make sure that that appropriate additional control measures are in place.

Measures Specific to Trackout

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

Appendix 7 Dispersion Model Results

Annual Mean NO_2 Impacts

Receptor	Without (µg/m³)	With (µg/m³)	With % of AQO	Change (µg/m³)	Change (% AQO)	Impact Descriptor
R1	12.2	12.3	30.8	0.2	0.4	Negligible
R2	14.4	14.5	36.3	0.1	0.3	Negligible
R3	14.7	14.9	37.3	0.2	0.6	Negligible
R4	12.3	12.5	31.3	0.3	0.6	Negligible
R5	9.8	9.8	24.6	0.1	0.2	Negligible
R6	15.4	15.5	38.7	0.1	0.2	Negligible

Note: all concentrations round to the nearest 0.1µg/m³, any apparent discrepancies 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
R1	14.5	14.6	36.5	0.1	0.2	Negligible
R2	14.6	14.6	36.6	0.0	0.1	Negligible
R3	15.0	15.1	37.8	0.1	0.2	Negligible
R4	14.7	14.8	37.0	0.1	0.2	Negligible
R5	13.7	13.8	34.4	0.0	0.1	Negligible
R6	16.0	16.1	40.2	0.0	0.1	Negligible

Note: all concentrations round to the nearest 0.1µg/m³, any apparent discrepancies 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
R1	9.4	9.4	37.6	0.0	0.3	Negligible
R2	9.5	9.5	37.9	0.0	0.1	Negligible
R3	9.7	9.7	38.9	0.0	0.2	Negligible
R4	9.6	9.7	38.8	0.1	0.3	Negligible
R5	9.1	9.1	36.4	0.0	0.1	Negligible
R6	9.9	9.9	39.8	0.0	0.1	Negligible

Note: all concentrations round to the nearest 0.1µg/m³, any apparent discrepancies due to rounding.

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