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9.1 INTRODUCTION

9.1.1 This chapter of the ES has been produced by Hydrock, on behalf of L&Q Estates, Charles Brown & Simon Digby, and London & Metropolitan International Developments to assess the Proposed Development in relation to the effects it would have upon Air Quality.

9.1.2 Potential effects can arise from dust impacts associated with the construction of the Proposed Development, as well as traffic impacts from both construction and operation. This chapter presents the results and conclusions of the assessment of potential effects and discusses mitigation measures where necessary.

9.1.3 The technical competency of the main chapter author is demonstrated by the qualifications and memberships listed below:

- MSc Environmental Policy and Management;
- BSc (Hons) Environmental Resource Management;
- Professional Membership with the Institution of Environmental Sciences (IES) and the Institute of Air Quality Management (IAQM).

9.1.4 The full Air Quality Assessment technical report can be found at Appendix 9.1.

9.2 RELEVANT POLICY

EU Policy

9.2.1 The overriding policy document which governs air regulation is the EU Council Directive on ambient air quality and cleaner air for Europe (2008/50/EC)[1], which came into force in 2008, and provides statutory guidance on air quality. This presents statutory requirements for the protection of human health and ecosystems through long and short-term limit values for: oxides of nitrogen (NO_x), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), particulate matter with a diameter of less than 10 microns (PM_{10}), particulate matter with a diameter of less than 2.5 microns ($PM_{2.5}$) carbon monoxide (CO), lead, benzene and ozone (O_3). The above legislation replaces the EU's previous three daughter directives.

9.2.2 In addition, the Committee on the Medical Effects of Air Pollution (COMEAP)[2], the World Health Organisation (WHO)[3] and the United Nations Economic Commission for Europe (UNECE)[4] provide medical and scientific evidence of the health risks to the general public and recommended concentration limits.

UK Policy

9.2.3 The above EU limit/target values within the EU Directives 2008/50/EC and 2004/107/EC were transposed into UK Law as part of the Air Quality Standards Regulations5 which came into force in 2010.

9.2.4 These set out how the government has interpreted these directives and sets out Air Quality Objectives (AQOs) that are maximum ambient pollutant concentrations that are not to be exceeded either without exception or with a permitted number of exceedances over a specified timescale. One of the main additions to these was the addition of the regulatory framework on PM2.5.

9.2.5 The Air Quality Strategy 2007 Volume 16 outlines the National Air Quality Objectives that should be achieved. Whilst central government is ultimately responsible for meeting these objectives, part of the Environment Act 19957 dictates that a local authority is required to

1 EC, 'Directive 2008/50/EC of the European Parliament and of the Council', 21 May 2008, 50.

2 COMEAP, 'The Mortality Effects of Long-Term Exposure to Particulate Air Pollution in the United Kingdom' (London: Committee on the Medical Effects of Air Pollutants (COMEAP), November 2010).

3 WHO, 'WHO | Air Pollution', WHO, 2016, http://www.who.int/topics/air_pollution/en/.

4 UNECE, 'Air Pollution - Air Pollution - Environmental Policy - UNECE', 2016, http://www.unece.org/env/lrtap/welcome.html.

5 Parliament, "The Air Quality Standards Regulations 2010," June 11, 2010, http://www.legislation.gov.uk/uksi/2010/1001/pdfs/uksi_20101001_en.pdf.

6 Defra, 'The Air Quality Strategy for England, Scotland, Wales and Northern Ireland - Volume 1' (Department for Food, Environment and Rural Affairs (Defra), July 2007), https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/69336/pb12654-air-quality-strategy-vol1-070712.pdf.

7 Environment Agency, 'Environment Act 1995' (The Environment Agency, 2002), http://www.legislation.gov.uk/ukpga/1995/25/contents.

assess and periodically review their compliance with the objectives and any areas that repeatedly exceed the allowed limits should be designated Air Quality Management Areas (AQMAs). The limits are shown in Table 9.1.

Table 9.1: National Air Quality Objectives

Pollutant	Units	Averaging Period	Air Quality Standard (AQS)	National Air Quality Objectives (NAQO)
Nitrogen dioxide (NO_2)	$\mu g/m^3$	1 Hour Mean	200 $\mu g/m^3$	Not to be exceeded more than 18 times in a year.
		Annual Mean	40 $\mu g/m^3$	
Particulate matter (PM_{10})	$\mu g/m^3$	24 Hour Mean	50 $\mu g/m^3$	Not to be exceeded more than 35 times in a year.
		Annual Mean	40 $\mu g/m^3$	
Particulate matter ($PM_{2.5}$)	$\mu g/m^3$	Annual Mean	25 $\mu g/m^3$	25 $\mu g/m^3$

National Planning Policy Framework

9.2.6 The National Planning Policy Framework8 requires that planning decisions for any new development should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of AQMAs 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. Furthermore, planning decisions should ensure that any new development in AQMAs and Clean Air Zones is consistent with the local air quality action plan.

Planning Practice Guidance

9.2.7 Reference ID 32 (Air Quality) of the National Planning Practice Guidance (PPG)9, which was updated in November 2019, provides guiding principles on how planning can take account

8 Ministry of Housing, Communities and Local Government, "National Planning Policy Framework," July 2021, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf

9 Ministry of Housing, Communities & Local Government, "Reference ID (32) Air Quality" (Ministry of Housing, Communities & Local Government, 2019), https://www.gov.uk/guidance/air-quality--3.

of the impact of new development on air quality. The PPG summarises the importance of air quality in planning and the key legislation relating to it.

Adopted Local Plan

9.2.8 Cherwell District Council's (CDCs) Adopted Local Plan addresses air quality in both the saved policies from the Cherwell Local Plan 199610 and the Cherwell Local Plan 2011-2031 Part 1 (incorporating Policy Bicester 13 re-adopted on 19 December 2016)11.

9.2.9 Policy ENV1 from the Cherwell Local Plan 1996 states that:

"*Development which is likely to cause materially detrimental levels of noise, vibration, smell, smoke, fumes or other type of environmental pollution will not normally be permitted*."

9.2.10 Policy ESD 10: Protection and Enhancement of Biodiversity and the Natural Environment in The Cherwell Local Plan 2011-2031 Part 1 states that:

"*Protection and enhancement of biodiversity and the natural environment will be achieved by the following:*

…Air quality assessments will also be required for development proposals that would be likely to have a significantly adverse impact on biodiversity by generating an increase in air pollution."

9.2.11 Strategic Objective SO 15 in The Cherwell Local Plan 2011-2031 Part 1 is:

"*To protect and enhance the historic and natural environment and Cherwell's core assets, including protecting and enhancing cultural heritage assets and archaeology, maximising opportunities for improving biodiversity and minimising pollution in urban and rural areas*."

9.2.12 Policy Bicester 13: Gavray Drive (re-adopted) includes specific considerations in regards to the Application Site, but does not contain any specific considerations relevant to air quality.

10 Cherwell District Council, "Cherwell Local Plan 1996," November 1996, https://www.cherwell.gov.uk/info/83/local-plans/373/adopted-local-plan-1996-november-1996.

11 Cherwell District Council, "The Cherwell Local Plan 2011-2031 (Incorporating Policy Bicester 13 Re-Adoption December 2016)," July 2015, https://www.cherwell.gov.uk/downloads/download/45/adopted-cherwell-local-plan-2011-2031-part-1-incorporating-policy-bicester-13-re-adopted-on-19-december-2016

Air Quality Guidance

9.2.13 Defra's LAQM.TG (16)[12] and the EPUK & IAQM Land-use Planning & Development Control: Planning for Air Quality[13] have been followed as guidance to produce this assessment. The IAQM's guidance on assessing impacts from construction[14] has also been followed.

12 Defra, "LAQM Technical Guidance LAQM.TG16" (Department for Food, Environment and Rural Affairs (Defra), February 2018), https://laqm.defra.gov.uk/documents/LAQM-TG16-February-18-v1.pdf.

13 IAQM, "Land-Use Planning & Development Control: Planning for Air Quality" (Institute for Air Quality Management (IAQM), January 2017), http://www.iaqm.co.uk/text/guidance/air-quality-planning-guidance.pdf.

14 IAQM, "Guidance on the Assessment of Dust from Demolition and Construction" (Institute of Air Quality Management (IAQM)), February 2014), http://www.iaqm.co.uk/text/guidance/construction-dust-2014.pdf

9.3 ASSESSMENT METHODOLOGY

Scoping Opinion

9.3.1 A Scoping Report was submitted to CDC in September 2020. A Scoping Opinion was received from the council on 11 November 2020. Within this Scoping Opinion, the comments relating to air quality were that it should be scoped into the EIA in the interest of securing a robust EIA.

9.3.2 In addition, CDC's Environmental Health Officer (EHO) requested a Damage Cost calculation in their response to the Scoping Report.

EHO Consultation

9.3.3 In addition to the above, further consultation was carried out with CDC's EHO in January 2021. Full details of the air quality assessment approach were agreed with CDC's EHO prior to assessment. The only comment of consequence was:

"*…you should look at the possible impacts of the activities on the nearby industrial estates as part of the assessment*."

Scope of Assessment

9.3.4 The likely significant air quality effects from the construction and operation of the Proposed Development have been assessed in preparing this ES chapter. This includes consideration of nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$) and dust.

9.3.5 The impacts of the adjacent railway on the Proposed Development are not considered to require further assessment in line with Defra's LAQM.TG (16)[12]. The railway tracks in question are not listed as a relevant line with heavy traffic of diesel passenger trains in the LAQM.TG (16) guidance. Additionally, the background annual mean NO_2 concentration is not considered to be above 25µg/m^3. Accordingly, consideration of railway emissions has been scoped out.

9.3.6 An assessment of potential impacts from the industrial estate in the vicinity of the Proposed Development has been undertaken, as requested by the EHO. It is not considered that any activities occur on the industrial estate that require further assessment within the ES. Further details of the assessment undertaken are included within Appendix 9.1: Section 6.3.1.

9.3.7 A Construction Dust Risk Assessment has been undertaken in line with the IAQM's guidance on assessing impacts from construction[14].

9.3.8 The IAQM's guidance states that, from experience of assessing exhaust emissions from site traffic, it is unlikely that any significant adverse impacts on local air quality would be caused and in the vast majority of cases, quantitative assessment is not needed. As such, short term effects of construction traffic emissions have not been assessed.

9.3.9 An operational phase impact assessment has been undertaken in accordance with the EPUK & IAQM Land-use Planning & Development Control: Planning for Air Quality[13]. The study area was determined by the changes in traffic flows associated with the scheme on the surrounding local road network where high-sensitivity human receptors are located.

9.3.10 Construction phase impacts are considered to be short-term and temporary in nature. Operational phase impacts are expected to be permanent.

Data sources

9.3.11 The following data sources have been used throughout the air quality assessment:

- Data from the National Atmospheric Emissions Inventory;
- Defra's modelled background concentrations of AQS pollutants (UK-AIR);
- CDC's latest available air quality monitoring data, derived from the latest available Air Quality Annual Status Report published in 2020[15];
- Traffic data provided by the transport consultants for the project (Markides Associates), and;
- Multi-Agency Graphic Information for the Countryside (MAGIC)[16] for scoping relevant ecological sites in the area.

Assessment approach

Consideration of Human Health

9.3.12 Air Quality is of direct relevance to human health. The UK's AQS and associated NAQOs, as detailed in Table 9.1, are human health-based standards against which changes in air quality and compliance has been assessed in the preparation of this ES chapter.

15 Cherwell District Council, "2020 Air Quality Annual Status Report (ASR)," June 2020.

16 Natural England and MAGIC partnership organisations., "Multi Agency Geographic Information for the Countryside.," 2020, https://magic.defra.gov.uk/MagicMap.aspx

Consideration of Climate Change

9.3.13 The UK CP18 Climate Change projections indicate that during the summer season, mean air temperatures will increase, average precipitation rates will decrease and average wind speeds will decrease, resulting in dryer and warmer summers. Such changes are likely to result in higher dust levels during construction due to dryer and warmer weather thus producing more dust. This could indicate that construction dust risk impacts could be higher than outlined in the assessment.

9.3.14 The climate projections indicate that during the winter season, the mean air temperature will increase, the average precipitation rate will increase and average wind speeds are likely to stay roughly the same, resulting in warmer and wetter winters.

9.3.15 Emissions of Carbon Dioxide (CO_2) and local air pollutants arise mainly from the same combustion sources, including road vehicles.

9.3.16 According to Environmental Protection UK's guidance for Local Authorities on Air Quality and Climate Change interactions[17], the main pollutants of concern are:

- Black carbon (soot) – black carbon, for example from diesel exhausts, can decrease the amount of sunlight reflected from the earth's surface and therefore have a warming effect.
- Ozone – ground-level ozone is a powerful greenhouse gas and has a warming impact.

9.3.17 These pollutants have not been assessed in this ES Chapter. However, many common air pollutants are 'climate active', and reducing emissions will lessen the warming effect on our climate.

9.3.18 Accordingly, the following potential effects of climate change have been considered in this ES chapter:

- Potential for higher dust levels due to warmer weather during construction phase (however, an increased precipitation rate will also result in higher suppression of suspended dust);
- Climate implications of vehicle emissions during the operational phase:
    - Impacts from the climate change projections during the operational phase are difficult to determine. Warmer and dryer summers could result in

17 EPUK, "Air Quality and Climate Change: Integrating Policy Within Local Authorities", March 2011, http://www.iaqm.co.uk/text/guidance/epuk/aq_and_cc_guidance.pdf

reduced vehicle use; however, warmer and wetter winters could result in an increased use in vehicle use,

Construction Phase

9.3.19 The construction phase of the Proposed Development will involve a number of activities that will produce polluting emissions to air. Predominantly, these will be emissions of dust.

9.3.20 A construction dust risk assessment has been prepared in accordance with IAQM guidance. This considers the risk of impacts during the construction phase in terms of nuisance dust, human health (PM_{10} exposure) and ecological impacts.

Potential Dust Emission Magnitude

9.3.21 Activities on construction sites with the potential to generate dust and emissions can be categorised into four main activities:

- Demolition – any activities associated with the removal of existing structures on site;
- Earthworks – includes the processes of soil-stripping, ground-levelling, excavation and landscaping;
- Construction – any activities relating to the provision of new structures on site; and
- Trackout – the transport of dust and dirt from the construction site onto the public road network where it may be deposited and re-suspended by traffic using the network.

9.3.22 No demolition works are associated with the Proposed Development. Accordingly, no further consideration is given to this activity as the risk of impact is Negligible.

9.3.23 The potential dust emission magnitude for each of the activity is determined on the scale and magnitude of the work s, and are classified as small, medium or large depending on the criteria outlined below in Table 9.2.

Table 9.2: Potential Dust Emission Magnitude Criteria

Activity	Dust Emission Magnitude		
	Small	**Medium**	**Large**
Earthworks	Total site area <2 ,500 m^2, soil type with large grain size (e.g. sand), <5 heavy earth moving vehicles active at any one time, formation of bunds	Total site area 2,500 m^2 – 10,000 m^2, moderately dusty soil type (e.g. silt), 5-10 heavy earth moving vehicles active at any one time, formation of bunds 4 m - 8 m in height, total material moved 20,000 tonnes – 100,000 tonnes; and	Total site area >10,000 m^2, potentially dusty soil type (e.g. clay, which will be prone to suspension when dry due to small particle size), >10 heavy earth moving vehicles active at any one time, formation of bunds >8 m in height, total material moved >100,000 tonnes;
Construction	Total building volume <25,000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber)	Total building volume 25,000 m^3 – 100,000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and	Total building volume >100, 000 m^3, on site concrete batching, sandblasting;
Trackout	<10HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length	10-50 HDV (>3.5t) outward movements16 in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m; and	>50 HDV (>3.5t) outward movements16 in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100 m;

Sensitivity of the Area

9.3.24 The sensitivity of the area is then defined, based on the individual sensitives of the receptors in the area, the proximity and number of those receptors and local background concentrations of PM_{10}.

9.3.25 With regard to human receptors, based on the IAQM guidance, residential dwellings are considered as high sensitivity receptors in relation to both dust soiling and adverse health effects of PM10. Indicative examples of medium sensitivity receptors include places of work, offices and hotels.

9.3.26 Within distances of 20 metres of the site boundary there is a high risk of dust impacts. Up to 100 metres from the construction site, there may still be a high risk, particularly if the receptor is downwind of the prevailing wind direction in relation to the dust source. At distances >100 metres up to 350 metres, the risk of impacts is low. Beyond 350 metres, the risk of impacts is Negligible.

9.3.27 With regard to ecological receptors, risk assessment should be taken where high-sensitivity receptors are located within 50 metres of a site boundary.

9.3.28 The sensitivity of the area is defined for separately dust soiling impacts as shown in Table 9.3, human health impacts as shown in Table 9.4 and ecological impacts as shown in Table 9.5 below. Figure 9.3 displays the receptors included within the construction dust risk assessment.

Table 9.3: Sensitivity of the area to dust soiling impacts

Receptor Sensitivity	Number of Receptors	Distance from Source (m)			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	0-10	Medium	Low	Low	Low
Medium	<1	Medium	Low	Low	Low
Low	<1	Low	Low	Low	Low

Table 9.4: Sensitivity of the area to human health impacts

Receptor Sensitivity	Annual Mean PM_{10} Concentrations	Number of Receptors	Distance from Source (m)				
			<20	<50	<100	<200	<350
High	>32 µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32 µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28 µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24 µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32 µg/m^3	>10	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32 µg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24 µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>1	Low	Low	Low	Low	Low

Table 9.5: Sensitivity of the area to ecological impacts

Receptor Sensitivity	Distance from Source (m)	
	<20	<50
High	High	Medium
Medium	Medium	Low
Low	Low	Low

Risk of Impacts

9.3.29 Once the potential dust emission magnitudes for each activity have been determined and the sensitivity of the area in relation to dust soiling and human health/ecological impacts have been determined, the risk of impacts can be defined. The risk of impacts is determined for each of the four activities using the matrixes in Tables 9.6 to 9.8 below.

Table 9.6: Risk of dust impacts – Earthworks

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

Table 9.7: Risk of dust impacts – Construction

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

Table 9.8: Risk of dust impacts – Trackout

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

9.3.30 The overall risk of impacts from the Proposed Development are the highest risk category for each of the activities and potential impacts.

Operational Phase

9.3.31 Additional emissions from Proposed Development generated traffic travelling along local roads within the study area have been assessed for exceedances of the NAQOs for NO_2, PM_{10} and $PM_{2.5}$ using the latest version of ADMS-Urban (version 5.1), which was released in April 2020 by Cambridge Environmental Research Consultants (CERC).

9.3.32 The model has been validated and approved by Defra for use as an assessment tool for calculating the dispersion of pollutants from traffic on UK roads.

9.3.33 The ADMS-Urban modelling has been used to calculate the road contribution of total receptor concentrations; therefore, background concentrations have been added to derive total concentrations.

9.3.34 EPUK and IAQM provide criteria for when a development has the potential to cause significant air quality impacts. These are:

- An increase of more than 100 Annual Average Daily Traffic (AADT) LGVs and/or 25 HGVs in or adjacent to an AQMA; or,
- An increase of more than 500 AADT LGVs and/or 100 HGVS outside of an AQMA.

9.3.35 Roads which are likely to experience an increase in traffic flows above criteria have been included within the dispersion mode to determine the potential for significant impacts.

9.3.36 It should be noted that the Transport Consultants (Markides Associates) confirmed that the impact through the Bicester AQMA no.4 will not exceed the EPUK and IAQM criteria. For more details see Appendix 9.1: section 3.5.1. Therefore, assessment through this AQMA has not been undertaken as it can be concluded that the impact would be Negligible, which is not significant.

Assessment Scenarios

9.3.37 The following assessment scenarios have been considered in this assessment:

- Baseline / Model Verification 2019;
- 2026 Do Minimum (DM): Baseline 2026 + Committed Development; and,
- 2026 Do Something (DS): Baseline 2026 + Committed Development + Proposed Development.

9.3.38 The above scenarios are consistent with IAQM guidance which states:

"Where these developments have been granted planning consent and are therefore 'committed' developments, their impacts should be assessed cumulatively with those of the

application site. The contribution of these committed developments should be accounted for in the 'future baseline', provided that their contributions can be quantified."

9.3.39 A sensitivity study has also been undertaken, whereby the DM and DS scenarios were repeated using 2019 emission factors and background concentrations from 2019 to account for the worst-case scenario, whereby vehicle emissions and background concentrations do not improve in line with Defra predictions.

Traffic Data

9.3.40 Traffic flows were provided by Markides Associates for all scenarios. It is understood that the source data for the 2019 baseline scenario was based on 2014 ATC Survey Data uplifted to 2019 by applying TEMPro growth factors. The data source for the future year scenarios for 2026 were derived from the Bicester SATURN model. The future year traffic data therefore includes the cumulative impact of committed developments accounted for in the Bicester SATURN transport model. Traffic flows used in the dispersion model are provided at Appendix 9.1: Appendix B. Modelled Roads are shown in Figure 9.1.

Emission Factors

9.3.41 The emission rates of pollutants from vehicles were calculated using the most up to date version of Defra's Emission Factor Toolkit (v.10.1)[18]. For model verification, 2019 factors were applied to the traffic data. For future year scenarios DM and DS, 2026 factors were applied. The sensitivity study used 2019 factors for the future year scenarios DM and DS. This accounted for the uncertainty in the predicted decrease in emissions from vehicles.

Speed Data

9.3.42 For each link assessed within the study area, vehicle speeds were obtained from the speed limit for each road derived from the OpenStreet Browser v4.10, which has been used as a proxy for average speeds on the network. Vehicle speeds were reduced by 10kph on approach to junctions relative to the speed limit to account for queuing and congestion in the average speed profile in accordance with LAQM.TG (16).

Meteorological Data

9.3.43 Detailed, hourly sequential meteorological data for wind direction, wind speed, temperature, humidity and cloud cover or the period 01/01/2019 – 31/12/2019 taken from Brize Norton weather station. Figure 9.2 shows the wind rose.

18 Defra, "Emissions Factor Toolkit (EFT) v.10.1", 2020, https://laqm.defra.gov.uk/documents/EFT2020_v10.1.xlsb?150221

9.3.44 The following surface roughness parameters have been applied in the model:

- Dispersion site surface roughness = 0.75;
- Met site surface roughness = 0.2;

9.3.45 Minimum Monin-Obukhov (MO) length of 10m was applied to both the Dispersion site and Met site (pre-set for 'Small Towns').

Modelled Receptors

9.3.46 The most sensitive human receptors to changes in local air quality are those where the annual NAQOs for NO_2, PM_{10} and $PM_{2.5}$ apply. These objectives are shown in Table 9.1. Indicative examples include residential properties, schools and hospitals in close proximity to relevant roads.

9.3.47 Sensitive human receptors are the primary focus of this assessment. All receptors have been modelled at a breathing height of 1.5m. Receptors have also been modelled at the boundary of the Proposed Development to assess the potential risk of exposure of future residents to poor air quality. All modelled receptors are shown in Table 9.9 and Figure 9.1.

Table 9.9: Sensitive Human Receptor Locations

Receptor Number	Receptor Location	Receptor Grid Reference
R1	Redwing Close	459401.3, 222317.1
R2	Heron Court	459671.4, 222141.1
R3	Shearwater Drive	459883, 221941.6
R4	Shearwater Drive	459955.4, 221876.1
R5	Shearwater Drive	459975.1, 221843.2
R6	Shearwater Drive	459966.7, 221830.3
R7	Shearwater Drive	459928.7, 221777
R8	Ravencroft	459557.1, 221430.6
R9	Ravencroft	459445.5, 221358.6
R10	Kestrel Way	459358, 221309.8
R11	Kestrel Way	459260.8, 221271.8
R12	Kestrel Way	459189.5, 221260
R13	Kestrel Way	459163.8, 221282.8
R14	Kestrel Way	459147.6, 221333.3
R15	Robins Way	459021.4, 221398.1
R16	London Road	458858, 221488.5
R17	Flanders Close	458796.6, 221579

R18	London Road	458755.6, 221799.9
R19	London Road	458744.2, 221879.9
R20	London Road	458736.2, 222079.2
S1	Proposed Development	459991.2, 221961.7
S2	Proposed Development	459962.8, 221921.8
S3	Proposed Development	459799.7, 222063.3
S4	Proposed Development	459907.4, 221970.2
S5	Proposed Development	459413.3, 222360.7
S6	Proposed Development	459714.2, 222150.1

Model Verification

9.3.48 A verification study has been undertaken using CDC's air quality monitoring data from 2019. Full details of this study are included in Appendix 9.1: Appendix D. The model was found to be under-predicting concentrations of NO_x and NO_2 when compared to monitored concentrations at CDC diffusion tubes at London Road and Aylesbury Road. Therefore, an adjustment factor of **1.587** was applied to the modelled results across the study area.

Model Uncertainty

9.3.49 It is not possible to remove all error from the modelling assessment due to the nature of data processed. Traffic data utilised in the model, especially projected data will have some uncertainty in it and where this data may change, results of the modelling process may change.

9.3.50 Another source of data utilised in the modelling process are predicted background concentrations, which in themselves have some uncertainty associated with them and the monitoring data they are based on which is not 100% accurate in terms of published concentrations due to the nature of the method of monitoring used.

9.3.51 The precautionary principle has been for the sensitivity test scenarios, which have assumed no improvement in background air quality or emission factors beyond the model verification year (2019) – i.e., the assessment does not take into account a predicted decrease in background pollutant concentrations or fleet emissions over time.

9.3.52 The Root Mean Square Error (RMSE) is used to define the average error or uncertainty of the model. According to LAQM.TG (16), the RMSE should ideally be within 10% of the relevant NAQO, but is acceptable where it is within 25%. The model verification process, calculated post-adjusted RMSE value of the model to be 0.24µg/m^3 for NO_2, which equates to 0.6% of the annual mean NAQO for NO_2. This RMSE value is within the acceptable range

of uncertainty in accordance with LAQM.TG (16). As such, the adjustment factor was considered appropriate for model adjustment.

9.3.53 Further information on modelling assumptions and model verification is shown at Appendix 9.1: Appendix D.

Significance criteria

Construction Phase

9.3.54 The construction dust risk assessment is undertaken pre-mitigation to determine the risk of impacts and requirements for mitigation. IAQM recommends that significance is only assigned to the effect after considering the construction activity with mitigation.

9.3.55 For almost all construction activity, the aim should be to prevent significant effects on receptors through the use of effective mitigation. Hence, the mitigation measures recommended in Appendix 9.1: Appendix G will reduce the risk of impacts to Negligible, and the significance of the residual impact will be 'Not significant'.

Operational Phase

9.3.56 The EPUK & IAQM Land-use Planning & Development Control: Planning for Air Quality guidance[13] provides a method for determining the significance of air quality impacts at sensitive receptor locations.

9.3.57 The difference between the DS and DM scenarios have been calculated for the assessment year and is presented as a percentage change in relation to the NAQO. This is applied to the predicted long-term concentration at each receptor location to determine the impact at each receptor location, following the matrix in Table 9.10.

Table 9.10: Assessment of Impacts and Significance at Receptor Locations

Long term average concentrations at receptor in assessment year	% change in concentration relative to National Air Quality Objective (NAQO)			
	1	2-5	6-10	>10
75% or less of NAQO	Negligible	Negligible	Slight	Moderate
76-94% of NAQO	Negligible	Slight	Moderate	Moderate
95-102% of NAQO	Slight	Moderate	Moderate	Substantial

103-109% of NAQO	Moderate	Moderate	Substantial	Substantial
110% or more of NAQO	Moderate	Substantial	Substantial	Substantial

9.3.58 IAQM guidance does not prescribe criteria for determining significance. It recommends that professional judgement is applied to determine the overall significance of impact. It states that the judgement on significance relates to the consequences of the impact. Factors considered in determining the significance of impact include:

- Magnitude of change;
- Total predicted concentration (is the NAQO achieved?); and
- Spatial extent of adverse impacts.

9.3.59 For the purposes of this chapter, Negligible and Slight impacts are described as Not Significant effects and Moderate and Substantial impacts are described as Significant effects.

9.4 BASELINE CONDITIONS

The current baseline

9.4.1 The current baseline air quality conditions in the study area have been established through compilation and review of appropriately sourced monitoring and modelling data.

AQMAs

9.4.2 CDC have four AQMAs declared in the district. The closest of these is the Air Quality Management Area No.4, located in the centre of Bicester, which was declared by CDC in 2015 for exceedances of the annual mean NAQO for NO_2. This is located approximately 900m west from the Application Site boundary.

9.4.3 CDC's AQAP (2017)[19] provides the details of priority measures taken by the council to improve air quality in the AQMAs. These measures include:

- Priority 1 – Strengthening local policy to improve air quality and its role in protecting health;
- Priority 2 – Reducing NOx emissions from cars in all AQMAs;
- Priority 3 – Ensuring new developments encourage and facilitate low emission and alternative transport;
- Priority 4 – Ensuring transport infrastructure delivery takes account of air quality improvement potential within AQMAs, and;
- Priority 5 – Raising awareness of poor air quality and encouraging improvement actions by vehicle users and fleet managers.

UK-AIR Background Concentrations

9.4.4 Defra provides estimated background concentrations of AQS pollutants at the UK-AIR website. These estimates are produced using detailed modelling tools and are presented as concentrations at central $1km^2$ National Grid square locations across the UK. At the time of writing, the most recent background maps were from August 2020 and based on monitoring data from 2018.

9.4.5 Estimated background concentrations of the key AQS pollutants relevant to this assessment are presented in Table 9.11 for NO_2, PM_{10} and $PM_{2.5}$. The background concentrations are all below the NAQOs.

19 Cherwell District Council, "Cherwell District Council Air Quality Action Plan -2017," March 1, 2017.

Table 9.11: Defra background concentrations (µg/m^3)

Defra Grid Square	2019			2021			2026		
	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$	NO_2	PM_{10}	$PM_{2.5}$
459500, 222500	10.98	14.63	9.77	10.00	14.17	9.40	8.62	13.50	8.86
460500, 222500	9.89	14.34	9.62	8.97	13.88	9.25	7.59	13.21	8.70
459500, 221500	10.44	14.96	9.92	9.55	14.50	9.56	7.98	13.84	9.03
460500, 221500	9.24	14.69	9.42	8.41	14.24	9.06	7.13	13.57	8.52

9.4.6 In 2019, 2021 and 2026, annual mean background concentrations of NO_2, PM_{10} and $PM_{2.5}$ were modelled to be well below the annual mean NAQOs at the grid squares within which the Application Site is located.

Cherwell District Council Air Quality Monitoring

9.4.7 In 2019 CDC monitored at 42 sites using passive diffusion tubes. CDC did not undertake any automatic monitoring of air quality in the district in 2019. The results for monitoring sites located within 2km of the Application Site, and therefore most representative of air quality conditions, are shown below in Table 9.12.

Table 9.12: Annual Mean NO_2 Monitoring Results (µg/m^3)

Site ID	Site Type	In AQMA?	X	Y	2015	2016	2017	2018	2019
Kings End South	Roadside	YES	458006	222404	**46**	**46**	**41.7**	**41.9**	**41.5**
St Johns 2014	Kerbside	YES	458310	222720	38.3	36.2	37.8	38.6	31.7
Field Street	Kerbside	YES	458214	222836	36.5	34.3	33.5	31.6	32.1
North Street	Kerbside	YES	458274	222935	39.8	37.9	36.5	37.6	35.6
Queens Avenue (x3)	Kerbside	YES	458028	222471	38.7	38.7	39.5	35	35.6
Causeway	Kerbside	NO	458419	222334	20	22.5	18.3	-	25.5
Market Square 2014	Roadside	NO	458539	222381	23.7	25.4	24.7	23.1	22.2
Aylesbury Rd 2014	Roadside	NO	459100	221190	30.5	30	28.8	29.5	26.7
London Road 2016	Roadside	NO	458721	222115	-	29.1	26.3	25.7	23.6
Villiers Road	Urban Background	NO	457619	222535	16.9	18.2	17.9	17.2	17
Note: Exceedances of the NO2 annual mean objective of 40µg/m3 are shown in bold.									

9.4.8 The only exceedances of the annual mean NAQO for NO_2 in study area in recent years have occurred within the CDC AQMA No.4 (the Bicester Centre AQMA). Since 2015, only the Kings End South monitoring site has exceeded the NO_2 annual mean NAQO. In 2019, this location monitored a 3.75% exceedance of the NAQO.

9.4.9 At all other monitoring locations, the 2019 annual mean NO_2 concentrations were not at risk of exceeding the NAQO, in accordance with Defra LAQM.TG (16), as were greater than 10% below the NAQO. The overall trend of the Roadside and Kerbside monitoring sites is a decreasing concentration of NO_2 since 2015. The exception to this trend is the Causeway monitoring site where 2019 concentrations were highest in 2019

9.4.10 Villiers Road monitoring site, which is representative of Urban Background concentrations in Bicester, was 57.7% below the annual mean NO_2 NAQO in 2019. The concentration of NO_2

at this site has consistently remained well below the NAQO, as would be expected in an urban background location.

The projected future baseline

9.4.11 Most of the CDC monitoring sites in the study area have seen an improvement in air quality, especially those within the Bicester Centre AQMA. With the continuing improvements in the fleet emissions rates and implementation of CDC's AQAP measures, the improvements in local air quality, as shown by the local monitoring, would be projected to continue in line with the roll out of cleaner vehicles and strategies to reduce emissions across all sectors. However, these projected improvements may be offset by any significant new development in the area that could act to add additional traffic to the local highways network, therefore increasing vehicle emissions.

9.4.12 With regards to the Defra background concentrations, all pollutant concentrations are predicted to decline incrementally each year. These reductions are principally due to the forecast effect of the roll out of cleaner vehicles and strategies to reduce emissions across all sectors.

9.4.13 The future baseline is represented by the Do Minimum scenario in the modelling assessment. All modelled annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ across the study area are below the relevant NAQOs in both baseline scenarios (including the sensitivity test).

9.5 POTENTIAL EFFECTS

Construction Phase

Potential magnitude of dust emissions

Earthworks

9.5.1 The area of the Application Site is over the IAQM's Large threshold of 10,000m^2. There are likely to be more than 10 heavy moving vehicles active at one time. The underlying soil texture is described as loamy and clayey[20] and therefore may have a high potential for dust release when dry due to the small particle size. Therefore, the potential dust emission magnitude for this stage is considered 'Large'.

Construction

9.5.2 At this stage, it is estimated that the total volume of building to be erected would be within the IAQM's Large threshold of >100,000m^3. Therefore, the potential dust emission magnitude for this stage is considered 'Large'.

Trackout

9.5.3 The unpaved road network is not likely to be greater than 50m in length, as the existing road network will be used to access the Application Site. However, the number of site vehicles is likely to be within the IAQM's 'Medium' threshold of 10-50 HDV (>3.5t) outward movements. Accordingly, the potential dust emission magnitude during Trackout is considered to be 'Medium'.

Sensitivity of Area

9.5.4 The prevailing wind direction for the closest regionally representative meteorological measurement station to the Application Site, at Brize Norton is shown in Figure 9.2. The wind rose shows that the prevailing winds are from the south-west. As such, receptors downwind (i.e., north-east) of the Application Site are more sensitive to dust impacts than those located upwind.

9.5.5 Sensitive Receptors have been identified within 350m of the Proposed Development. These are shown in Figure 9.3.

9.5.6 There are 1-10 high-sensitivity receptors within 20m of the Application Site boundary. Additionally, there are 10-100 high-sensitivity receptors within 50m of the Application Site

20 Cranfield University, "Cranfield Soil and Agrifood Institute," n.d., http://www.landis.org.uk/soilscapes/.

boundary. According to IAQM guidance, the overall sensitivity of the surrounding area to nuisance dust soiling effects during the Earthworks and Construction stages is defined as 'Medium'.

9.5.7 With regard to Trackout, the sensitivity is assessed where receptors are located within 50m from Trackout routes up to 500m from the Application Site. As there are 1-10 high-sensitivity receptors within 20m of the Trackout route and there are 10-100 high-sensitivity receptors within 50m of the Trackout route, the sensitivity to dust soiling impacts from Trackout is defined as 'Medium'.

9.5.8 UK-AIR predictions show that annual mean concentrations of PM_{10} are well below 32 $\mu g/m^3$ in the vicinity of the Application Site (the concentration at which exceedance of the 24-hour NAQO is likely), and are not likely to exceed 24 $\mu g/m^3$. According to IAQM guidance, where PM_{10} concentrations are <24 $\mu g/m^3$ and there are fewer than 100 high sensitivity receptors within 20m of the Application Site boundary, the overall sensitivity of the surrounding area to human health impacts is defined as 'Low' for all stages.

9.5.9 Within the Application Site is the Gavray Drive Meadows Local Wildlife Site. This is considered to be located within 20m of all stages of construction phase activities. In consultation with the Project ecologists, EDP, this site has been classified as a Low sensitivity receptor. Therefore, with reference to IAQM criteria, the overall sensitivity of the area to ecological impacts is defined as 'Low' for all stages.

Risk of Impacts

9.5.10 Using the methodology prescribed in the IAQM guidance, the overall risk of impacts can be defined by combining the sensitivity of the area with the potential dust emission magnitude of each stage of the construction phase as described above.

9.5.11 Table 9.13 provides a summary of the construction dust risk assessment. Overall, the development is considered to be Medium Risk for nuisance dust soiling effects and Low Risk for PM_{10} health effects and ecological effects in the absence of mitigation.

Table 9.13: Risk of adverse impacts during construction phase

Construction Activity	Risk of Impacts		
	Nuisance Dust Soiling	**Human Health**	**Ecological**
Earthworks	Medium	Low	Low
Construction	Medium	Low	Low
Trackout	Low	Low	Low

Operational Phase

9.5.12 The full results of the dispersion modelling assessment for NO_2, PM_{10} and $PM_{2.5}$ are shown at Appendix 9.1: Section 6.1. The impact of the Proposed Development on local air quality has been assessed as the increase in pollutant concentrations from the DM to DS scenario, therefore taking account of the impact of the Proposed Development, as well as cumulative impacts. The significance of the impact, for each pollutant, at each receptor location has also been determined against the EPUK / IAQM guidance.

Annual Mean NO_2

9.5.13 The impact of the Proposed Development on annual mean NO_2 concentrations is **Negligible** at all receptor locations when assessing the increase from DM to DS. The maximum increase in annual mean NO_2 was 0.17µg/m^3 at R04 and R05. With reference to IAQM significance criteria, as increases at all receptors are deemed to be Negligible, the predicted effects, including cumulative impacts, are **Not Significant**.

9.5.14 With regards to the 1-hour NO_2 objective, Defra's LAQM.TG(16) states where the annual means are below 60µg/m^3, it is unlikely that exceedances of the 1-hour mean will occur. As all modelled results are well below this threshold, it is unlikely that the 1-hour NO_2 NAQO is exceeded at any of the receptor locations.

Annual Mean PM_{10}

9.5.15 The impact of the Proposed Development on annual mean PM_{10} concentrations is **Negligible** at all receptor locations when assessing the increase from DM to DS. The maximum increase in annual mean PM_{10} was 0.07µg/m^3 at R04 and R20. With reference to IAQM significance criteria, as increases at all receptors are deemed to be Negligible, the predicted effects, including cumulative impacts, are **Not Significant**.

9.5.16 The NAQO for 24-hour mean PM_{10} concentrations is 50µg/m^3 not be exceeded more than 35 times a year. The results illustrate that the maximum annual mean PM_{10} concentration is 16.72µg/m^3, predicted at receptor R14. As this predicted concentration is below 32µg/m^3, the number of 24-hour mean PM_{10} concentrations that exceed 50µg/m^3 are likely within the 35-day compliance limit with reference to IAQM guidance. Therefore, the 24-hour mean NAQO will not be exceeded.

Annual Mean $PM_{2.5}$

9.5.17 The impact of the Proposed Development on annual mean $PM_{2.5}$ concentrations is Negligible at all receptor locations when assessing the increase from DM to DS. The maximum increase in annual mean $PM_{2.5}$ was 0.04µg/m^3 at several receptors. With reference to IAQM

significance criteria, as increases at all receptors are deemed to be Negligible, the predicted effect, including cumulative impacts, are **Not Significant**.

Sensitivity Analysis

9.5.18 A sensitivity analysis of the assessment was also performed whereby the emissions factors for 2019 were used and the UK-AIR background concentrations of NO_2, PM_{10} and $PM_{2.5}$ used were also for 2019. This analysis therefore accounts for the worst-case scenario whereby traffic emissions do not improve in line with those in Defra's EFT and background concentrations do not decrease in line with UK-AIR predictions.

9.5.19 The results of this analysis were that the impact of the Proposed Development, assuming no improvement in vehicle emissions or background concentrations, was **Negligible** at all receptor locations for NO_2, PM_{10} and $PM_{2.5}$. Therefore, the predicted effects of the Proposed Development on annual mean concentrations of NO_2, PM_{10} and $PM_{2.5}$ at receptors is still considered **Not Significant**. The full results of the sensitivity analysis are at Appendix 9.1: Appendix E.

Risk of Exposure

9.5.20 The potential exposure of future residents of the Proposed Development to poor air quality is shown at Appendix 9.1: Section 6.3.

9.5.21 Receptors were also modelled at the boundary of the Proposed Development to assess the risk of exposure of future resident of the Proposed Development to poor air quality. This was done for the DS scenario, where the highest concentrations of pollutants were predicted.

9.5.22 Concentrations of NO_2, PM_{10} and $PM_{2.5}$ at receptors S1 to S6 were all well below the relevant NAQOs. Also, the results of the sensitivity study, using 2019 emissions factors and background concentrations from 2019 found concentrations were also below the NAQOs for all pollutants. Full model results for these receptors are at Appendix 9.1: Section 6.3. Therefore, the risk of exposure to poor air quality at the Proposed Development is considered to be low.

9.6 MITIGATION MEASURES

Construction Phase

9.6.1 The qualitative construction dust risk assessment shows that the Application Site is Medium Risk for adverse impacts during construction, as a worst-case, in the absence of mitigation.

9.6.2 To effectively reduce the risk of impacts to negligible, appropriate mitigation measures should be adopted from the IAQM's highly recommended mitigation measures for Medium risk sites and incorporated into a Dust Management Plan (DMP) or Construction Environmental Management Plan (CEMP). These are provided at Appendix 9.1: Appendix G.

9.6.3 It is not anticipated that any additional mitigation is required as a result of climate change implications. The construction phase is temporary and will take place during the shorter-term relative to climate change and the highest level of mitigation appropriate to the level or risk has been recommended in line with IAQM guidance. Any increased impacts as a result of climate change will be adequately mitigated.

Operational Phase

9.6.4 Results of the operational phase assessment show that the impact of the Proposed Development is expected to have a Negligible impact at all receptor locations. Therefore, the predicted effects of the Proposed Development are not significant and no additional mitigation is required to reduce the significance of impacts, in air quality terms.

9.6.5 However, as requested by CDC's EHO, a damage cost calculation has been performed. This is at Appendix 9.1: Section 7.

9.6.6 The total emissions 'damage cost' (sum of NO_x and $PM_{2.5}$) has been calculated at **£47,351**, which is the indicative value of a package of air quality mitigation measures to offset the real-world impact of emissions from the Proposed Development. Such mitigation measures could include, but are not limited to:

- Reducing demand for private car use through Travel Plans;
- Provision of Electric Vehicle Charging Infrastructure;
- Car Club / Car Sharing scheme to reduce reliance on single occupancy vehicles;
- Designate parking spaces for low emission vehicles;
- Provide electric bikes / scooters;
- Provide secure cycle storage;
- Encouraging / facilitating modal shift toward more sustainable travel options through scheme design such as;

- Ease of access to reliable public transport;
- Designated cycling routes, particularly avoiding congested/busy roads; and
- Pedestrianised areas and designated footpaths.

9.6.7 The Transport Consultant for the scheme, Markides Associates, have prepared a Travel Plan. A summary of measures included in this Travel Plan are:

- Provision of a Sustainable Travel Information Pack to residents;
- Personalised Travel Planning session offered to each household;
- Each unit will be provided with dedicated cycle parking provision;
- Travel Plan Coordinator to formulate a Bicycle User Group scheme for residents; and,
- Car sharing to be promoted.

9.6.8 Implementing these measures will also be beneficial in terms of air quality, as they will reduce the number of polluting vehicle trips caused by the development. The cost of travel plan measures will count toward reducing the damage costs.

9.6.9 If any gas fired boilers are proposed for the heating / hot water strategy, it is recommended these have a NO_x emission rate of less than 5 mg/s. This is equivalent to meeting the ultra-low NO_x emission rating of <40mg/kWh, in accordance with EPUK/IAQM guidance.

9.6.10 It is not anticipated that any additional mitigation is required as a result of climate change implications. The modelled concentrations predict negligible impacts well below the relevant NAQOs, and it is unlikely that any climate change impacts would result in a change to these impacts.

9.7 RESIDUAL EFFECTS

Construction Phase

9.7.1 The construction dust risk assessment was undertaken pre-mitigation. The scheme is considered to be Medium Risk for adverse impacts without mitigation.

9.7.2 Implementation of the recommended mitigation measures during the construction phase will reduce any the risk of impacts to negligible and the residual effects will be Not Significant.

Operational Phase

9.7.3 The operational phase assessment was undertaken pre-mitigation. No significant impacts have been predicted for the operational phase, including for cumulative impacts, at existing high sensitivity receptors.

9.7.4 Incorporating the mitigation measures outlined in sections 9.6.6 and 9.6.7 will further reduce the potential for adverse impacts. As such, no residual impacts during operation are expected.

Summary of effects

9.7.5 The effects identified are summarised in Table 9.14 below:

Table 9.14: Summary of effects

Potential effect	Significance (pre-mitigation)	Mitigation measure	Significance of residual effect
Construction stage			
Nuisance Dust Soiling	Not Applicable as significance not best practice to determine significance pre-mitigation.	Specific measures to be included in a DMP or CEMP as outlined at section 9.6.1 – 9.6.3 and Appendix 9.1: Appendix G.	**Not Significant**
Health Effects of PM_{10}	Not Applicable as significance not best practice to determine significance pre-mitigation.	Specific measures to be included in a DMP or CEMP as outlined at section 9.6.1 – 9.6.3 and Appendix 9.1: Appendix G.	**Not Significant**
Ecological Effects of Dust	Not Applicable as significance not best practice to determine significance pre-mitigation.	Specific measures to be included in a DMP or CEMP as outlined at section 9.6.2 and at Appendix G of Appendix 9.1.	**Not Significant**
Post-completion stage			
Additional Road Traffic causing Air Pollution	**Not Significant**	None required to address significant effects. Measures to offset the calculated damage costs and sustainable travel measures in Travel Plan detailed in Section 9.6.4 – 9.6.10.	**Not Significant**

9.8 CUMULATIVE EFFECTS

9.8.1 The cumulative effects of the operational phase traffic have been taken account inherently within the traffic data inputs to the assessment. In accordance with IAQM guidance, traffic data for future years scenarios, DM and DS, includes the traffic generation from other committed developments. No significant impacts have been predicted in any scenario at any receptor, and all predicted concentrations are well below the relevant NAQOs. On this basis, the Cumulative Impact is predicted to be Negligible, which is Not Significant.