10.0 Air Quality

10.1 Introduction

This chapter has been prepared by M-EC Ltd who are competent and experienced in undertaking Air Quality chapters and reports for inclusion within Environmental Statements:

- Rosie James, BSc, PIEMA with 10years' experience in the measurement, prediction and evaluation of air pollution from a variety of sources including transportation and construction
- Neil Forsdyke, with 7 years' experience in the measurement, prediction and evaluation of air pollution from a variety of sources including transportation and construction.

The chapter describes the assessment methodology, the baseline conditions at the site and surroundings, mitigation measures required to prevent, reduce or offset identified significant adverse impacts and the likely residual effects after these measures have been implemented.

Appendices	Title
Appendix 10.1	Scoping Correspondence
Appendix 10.2	Receptor Locations
Appendix 10.3	Receptor Location Plan
Appendix 10.4	Coleshill Weather Station Windrose
Appendix 10.5	Traffic Flow Data
Appendix 10.6	Verification
Appendix 10.7	Assessment Results

10.2 Scoping, Consultation and Overview of Potential Effects

10.2.1 Scoping and Consultation

The assessment methodology as detailed within the EIA Scoping Report (*Appendix 2.1*) has been confirmed by Coventry City Council (CCC) as appropriate. Scoping correspondence with CCC is included in *Appendix 10.1*.

10.2.2 Overview of Potential Effects

The following potential effects of the proposed development have been considered in this assessment:

- The air quality effects of the proposed construction phase upon existing sensitive receptors; and
- The air quality effects of development-related traffic during the occupation-phase upon existing and proposed sensitive receptors.

There are no sources of significant air quality impacts proposed as part of the development and therefore, the assessment of occupation phase effects is limited to development-related traffic.

10.3 Assessment Methodology

10.3.1 Legislation and Guidance

The UK has a legislative requirement to meet air quality limit values for key pollutants defined at a European level by European Council Directives:

- Directive 2008/50/EC on ambient air quality and cleaner air for Europe; and
- Directive 2004/107/EC relating to arsenic, cadmium, mercury, nickel and PAH.

These Directives are transposed into UK legislation by the Air Quality Standards Regulations 2010.

Table 10.1 summarises the national objectives and European 'limit value' obligations for PM_{10} and NO_2, the key transport-related pollutants of concern in the UK.

Table 10.1 - Summary of Air Quality Objectives

Pollutant	Air Quality Objectives	
	Concentration (µg/m3)	Averaging Period
Nitrogen Dioxide (NO_2)	200	1-hour mean; not to be exceeded more than 18 times a year
	40	Annual mean
Particulate Matter with an aerodynamic diameter of less than 10 microns (PM_{10})	50	24-hour mean; not to be exceeded more than 35 times a year
	40	Annual mean

Part IV of the Environment Act 1995 (the Act) requires UK government, and devolved administrations, to produce a national air quality strategy containing standards, objectives and measures for ameliorating ambient air quality, and to continually review these policies.

The Act also provides a legislative framework for a system of Local Air Quality Management (LAQM). This system is an integral part of delivering the UK's air quality obligations.

Under the LAQM regime, responsible authorities are required to carry out a regular review and assessment of air quality in their area, against defined national objectives, which have been prescribed in the regulations for the purposes of LAQM. Where it is found these objectives are unlikely to be met, responsible authorities must designate Air Quality Management Areas (AQMAs) and implement Air Quality Action Plans (AQAPs) to tackle the problems.

Provisions in the Act are largely enabling, and allow responsible authorities the power to take forward local policies to suit their own needs. Local circumstances will also determine the content of the local air quality policy, designation of AQMAs and the content of AQAPs.

Assessment has been undertaken with reference to the advice provided within the Department for Environment, Food and Rural Affairs (Defra) Local Air Quality Management Technical Guidance 2016 (LAQM.TG(16)), the Institute of Air Quality Management (IAQM) and Environmental Protection UK (EPUK) 'Guidance on Land-Use Planning and Development Control: Planning for Air Quality 2017 (v1.2), The Design Manual for Roads and Bridges

Section 11.3.1 'Air Quality' (HA207/07) (DMRB 11.3.1) and the IAQM's 'Guidance on the assessment of dust from demolition and construction' 2016.

10.3.2 Construction Phase Assessment Methodology

During construction, the main potential air quality impacts are the generation of dust from on-site activities and increases in nitrogen dioxide (NO_2) and particulate matter (PM_{10}) concentrations from plant and road vehicles.

Dust is a generic term covering particles of different compositions. The most common impacts relevant to this assessment are deposited dust from larger particles (disamenity dust) and increased ambient PM_{10} and $PM_{2.5}$ (smaller particles up to 10 microns and 2.5 microns in diameter), which can lead to adverse health effects.

There are no EU or UK air quality standards which define the point at which the amount of deposited dust, or dust episode frequency, will lead to disamenity. Additionally, there is no specific guidance relating to the assessment of construction dust nuisance within Government documents. Consequently, assessment of dust and air quality impact from construction works upon nearby sensitive receptors has been undertaken with reference to procedures contained within the Institute of Air Quality Management's 'Guidance on the assessment of dust from demolition and construction' 2016 (hereinafter referred to as IAQM Guidance). Where potential impacts are identified then site-specific mitigation measures proportionate to the level of risk are proposed.

The IAQM assessment procedure is divided into five steps:

- Step 1 - screening of any requirement for more detailed assessment;
- Step 2 - assess the risk of dust effects;
- Step 3 - determine site-specific mitigation; and
- Step 4 - assess significance of dust effects after applying mitigation.
- Step 5 - prepare dust assessment report.

Step 1 - Screening: IAQM Guidance states that assessment will normally be required if there are human sensitive receptors within 350 m of the boundary of the site, ecological receptors within 50m of the site boundary, and/or within 50 m of the route(s) used by construction vehicles on the public highway, up to 500 m from the site entrance(s).

Step 2 - Assessment of Risk of Dust Impacts: IAQM Guidance advises that the risk of dust arising in sufficient quantities to cause annoyance and/or health or ecological effects should be determined using four risk categories: negligible, low, medium and high risk. A site is allocated to a risk category based on two factors: the scale and nature of the works, which determines the potential dust emissions magnitude as small, medium or large (Step 2A), and the sensitivity of the area to dust impacts (Step 2B).These two factors are then combined to determine the risk of impact without mitigation applied.

Step 3 - Mitigation: Having determined the risk categories for each of the construction activities, site specific mitigation measures relating to the risk of dust impacts have been informed using the IAQM Guidance.

The IAQM Guidance states that, for those mitigation measures that are general, the highest risk category should be applied.

Step 4 - Effects and Significance: IAQM Guidance recommends that significance is only assigned to the effect after considering the construction activity with mitigation in place (residual effects). It is therefore important that the mitigation measures are defined in a form suitable for implementation, for example by way of a planning condition, and are included within a specific Dust Management Plan (DMP) or Construction Environmental Management Plan (CEMP) to be secured by planning condition.

Sensitivity of Receptor

The sensitivity of an area to dust impacts takes into account a number of factors including specific sensitivities of receptors, proximity and number of receptors and existing background PM_{10} concentrations.

IAQM Guidance states that assessment will normally be required if there are human sensitive receptors within 350 m of the boundary of the site, ecological receptors within 50m of the site boundary, and/or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

The number of receptors within each distance band from the site and likely traffic routes have been estimated, as set out in the IAQM Guidance.

With reference to advice contained within IAQM Guidance, *Tables 10.2 and 10.3* show how the sensitivity of the area may be determined as high, medium or low for dust soiling and human health effects.

Table 10.2 - Sensitivity of the Area to Dust Soiling Effects on People and Property [ab]

Receptor Sensitivity	Number of Receptors	Distance from source (m) [c]			
		<20	<50	<100	<350
High	>100	High	High	Medium	Low
	10-100	High	Medium	Low	Low
	1-10	Medium	Low	Low	Low
Medium	>1	Low	Low	Low	Low
Low	>1	Low	Low	Low	Low

Notes

a. *The sensitivity of the area should be derived for each of the four activities.*
b. *Estimate the total number of receptors within the stated distance. Only the highest level of area sensitivity needs to be considered.*
c. *For trackout, the distances should be measured from the side of the roads used by construction traffic. Without mitigation, trackout may occur from roads up to 500m from large sites. It is only necessary to consider trackout impacts up to 50m from the edge of the road.*

Source: IAQM Guidance

In this case, sensitive receptors located within 350m of the site boundary are located in residential areas off Tamworth Road, Fivefield Road, Bennetts Road and a proposed housing development located immediately to the south of this proposed development (ref: OUT/2014/2282).

Table 10.3 - Sensitivity of the Area to Human Health Impacts							
Receptor Sensitivity	**Annual Mean PM_{10}**	**Number of receptors**	**Distance from source (m)[e]**				
			<20	**<50**	**<100**	**<200**	**<350**
High	>32µg/m^3	>100	High	High	High	Medium	Low
		10-100	High	High	Medium	Low	Low
		1-10	High	Medium	Low	Low	Low
	28-32µg/m^3	>100	High	High	Medium	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	High	Medium	Low	Low	Low
	24-28µg/m^3	>100	High	Medium	Low	Low	Low
		10-100	High	Medium	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	<24µg/m^3	>100	Medium	Low	Low	Low	Low
		10-100	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Medium	>32µg/m^3	>10	High	Low	Low	Low	Low
		1-10	Medium	Low	Low	Low	Low
	28-32µg/m^3	>10	Medium	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	24-28µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
	<24µg/m^3	>10	Low	Low	Low	Low	Low
		1-10	Low	Low	Low	Low	Low
Low	-	>10	Low	Low	Low	Low	Low

The receptors include both existing and future receptors from the proposed residential led, mixed-use development located to the south (ref: OUT/2014/2282) incorporating approximately 800 dwellings, local centre, retail and commercial units and Primary school.

10.3.3 Occupation Phase Assessment Methodology

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

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

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

Current guidance has led to some changes in the way in which NO_2 concentrations should be modelled. In accordance with LAQM.TG(16) the ADMS-Roads model has been used to derive road-based concentrations of NO_x at specific receptor locations. To convert the modelled road-based NO_x to annual NO_2 the 'NO_x to NO_2' calculator (Version 5.1) has been applied to all modelled results.

The following scenarios have been included in the assessment:

- 2016 Base to enable verification of model performance against available NO_2 monitoring data;
- 2026 'Do Something 1' (Do Minimum including the proposed development); and
- 2026 'Do Something 2' (Do Something 1 including proposed developments in the SUE i.e. cumulative assessment).

The 2026 future year has been modelled using predicted 2026 traffic flow data, together with 2018 background and emissions data, to account for current uncertainty in future year projections. Background concentrations and vehicle emission factors are projected to decrease year on year due to fleet composition and technological changes. Using 2018 data therefore provides a conservative case for 2026 scenarios.

Dispersion has been informed by an ADMS-Roads-compatible hourly sequential meteorological data file for the Coleshill weather station, for the year 2016 (as complete data was available for this year). This has been used to approximate average weather conditions for all scenarios.

The windrose for Coleshill weather station is presented in *Appendix 10.4*. The predominant wind direction is from the north-northeast and is associated with the highest wind speeds. There is a lower occurrence of wind from other directions.

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

Traffic flow data, % HGV and average speed assumptions for each road source and for each assessment scenario are provided in *Appendix 10.5* for information. Cumulative development for the 2026 future year has been accounted for within the traffic data.

Emission rates for each road source have been derived from traffic flow data using the Emission Factors Toolkit (EFT), Version 8.0.1, published by Defra and the devolved administrations in October 2017. The EFT is incorporated within ADMS-Roads. The EFT allows users to calculate road vehicle pollutant emission rates for pollutants for a specified year, road type, vehicle speed and vehicle fleet composition.

Background concentrations of NO_2, NO_X, and PM_{10} have been obtained from the 2015-based maps available on the Defra website which provide estimated background pollutant concentrations for each 1kmx1km grid square in the UK.

As the background maps provide data for individual pollutant sectors, those sectors relating to road traffic have been removed to avoid double counting of road emissions. As only total background concentrations are provided for NO_2, the NO_2 map has been adjusted using the online NO_2 Adjustment for NO_x Sector Removal Tool (Version 6.0).

To determine how well the model is performing, and to correct any over, or under estimation of pollutant concentrations, LAQM.TG(16) recommends a verification process that should be applied. Verification involves a comparison between predicted and measured 'road traffic contributions' at one or more local sites and adjustment of the modelled concentrations if necessary.

Modelled pollutant concentrations have been verified against CCC's 2016 NO_2 monitoring results. Verification was carried out in accordance with guidance provided within LAQM.TG(16).

The derived adjustment factor is 6.55, and has been applied to all modelled road contribution NO_x and PM_{10}. Details of this verification process are included in *Appendix 10.6*.

Sensitivity of Receptor

Receptor locations are listed in *Appendix 10.2* and are shown on the Receptor Location Plan provided in *Appendix 10.3*.

Receptors have different sensitivities to changes in air quality. For the purpose of this assessment sensitivity is determined as Very High, High, Medium, Low and Negligible as detailed in *Table 10.4*.

The sensitivity of receptor is based on the longer term average concentration at the receptor in the assessment year (i.e. 2026) in relation to the Air Quality Assessment Level (AQAL), which in this case is 40µG/m^3, as specified in *Table 10.1*.

Table 10.4 - Methodology for Assessing Sensitivity of Receptor

Sensitivity	Criteria
Very High	Do Minimum pollutant concentration at ⩾110% of the AQAL.
High	Do Minimum pollutant concentration at 103-109% of the AQAL
Medium	Do Minimum pollutant concentration at 90 - 102% of the AQAL
Low	Do Minimum pollutant concentration at 75-90% of the relevant AQAL
Negligible	Concentration less than 75% of the relevant AQAL

Magnitude of Impact

Table 10.5 provides the criteria used for the classification of the magnitude of likely significant air quality impacts. The magnitude is based on the percentage change in air quality at a given receptor relative to the AQAL, in accordance with IAQM guidance.

Table 10.5 – Magnitude of Impact	
Magnitude	**Description**
Very High	Air quality varies between the do minimum and do something by more than 10% of the AQAL
High	Air quality varies between the do minimum and do something by 6 - 10% of the AQAL
Medium	Air quality varies between the do minimum and do something by 2 - 5% of the AQAL
Low	Air quality varies between the do minimum and do something by 1 - 2% of the AQAL
Negligible	Air quality varies between the do minimum and do something by less than 1% of the AQAL

Significance of Effect

The level of significance of each likely effect is determined through a combination of the magnitude of impact and the sensitivity of the receptor.

Table 10.6 is based on the IAQM guidance and shows how magnitude and sensitivity are combined to determine the significance of effect.

Table 10.6 - Impact Significance Matrix					
Sensitivity of Receptor	**Magnitude of Change**				
	Very High	**High**	**Medium**	**Low**	**Negligible**
Very High	Substantial	Substantial	Substantial	Moderate	Negligible
High	Substantial	Substantial	Moderate	Moderate	Negligible
Medium	Substantial	Moderate	Moderate	Minor	Negligible
Low	Moderate	Moderate	Minor	Negligible	Negligible
Negligible	Moderate	Minor	Negligible	Negligible	Negligible

10.4 Baseline Conditions

Baseline air quality refers to existing concentrations of relevant air pollutants that are already present, in this case PM_{10}, NO_2, and NO_x. PM_{10} is emitted from various sources, included road traffic, industry, domestic, agricultural and natural sources. NO_2 is a key road traffic-related pollutant.

CCC operates a network of NO_2 diffusion monitoring sites in their area. Monitoring data indicates that there were exceedances of the annual mean NO_2 objective at the majority of monitoring sites in 2016. It is noted that there are no monitoring sites located in the immediate vicinity of the proposed development, or the surrounding local road network.

CCC currently has a citywide AQMA, declared for exceedances of the relevant annual mean objective for NO_2 concentrations.

CCC NO_2 monitoring results for the nearest diffusion tubes to the development, from 2012 to 2016, are shown in *Table 10.7*.

Table 10.7- CCC NO_2 Monitoring Results						
Site ID	**Type**	**Annual Mean NO_2 (µg/m³)**				
		2012	**2013**	**2014**	**2015**	**2016**
BA1- Beake Avenue/ Radford Road	Diffusion Tube	59.8	32.9	38.3	37.7	39.7
BA1c- Beake Avenue	Diffusion Tube	-	-	-	33.9	30.3

Future Baseline

Predicted annual mean NO_2 and PM_{10} concentrations for the future baseline 2026 Do Minimum (DM) scenario at the receptor locations are shown in *Appendix 10.7*.

It can be seen from the results in *Appendix 10.7*, that annual mean concentrations for a baseline Do Minimum scenario (i.e. without development-related traffic) are predicted to exceed the annual mean objective for NO_2 within the CCC AQMA (40 µg/m^3) at Receptors 8, 31, 33, 63, 64, 82 and 83, with annual mean NO_2 concentrations ranging from 41.44 µg/m^3 at Receptor 64, to 47 µg/m^3 at Receptor 8.

Ecological Receptors

There are no significant ecologically sensitive receptors within 50m of the site, or within 50m of the expected route to be used by construction vehicles on the public highway, up to 500m from the site entrance.

Ecological effects have therefore, not been considered further in this assessment.

10.5 Mitigation Measures

10.5.1 Inherent Mitigation Measures

The following measures have been designed in to the proposed development in order to reduce single occupancy vehicle movements and associated emissions.

Access to Bus Services

The main access road through the site will be 6.5m wide to allow for the extension / re-routing of existing bus services.

There will be shared footway/cycleway provision to all new bus stops within the site and connections to the existing bus stops on Tamworth Road and Bennetts Road. Bus stops will be located to ensure that the majority of dwellings will be within a 400m walking distance.

Electric Vehicle Charging

5% of all new parking spaces will include provision for electric car charging points. In cases where the provision of this allocation is demonstrated to be impractical, 5% of spaces will have the capacity to easily retrofit recharging points.

Cycle Parking

Each dwelling will be provided with secure areas for cycle storage within the curtilage of individual plots.

10.5.2 Standard Mitigation Measures

Construction Phase

With respect to dust generation during construction, the site falls within a high risk category as defined by the IAQM Guidance. On this basis, the best practice mitigation measures are set out in the draft CEMP in *Appendix 4.1*.

The mitigation measures shall be updated and agreed with the LPA's Environmental Health Department and incorporated with the detailed CEMP before start of work on site.

Occupation Phase

A Framework Travel Plan has been prepared for the proposed development, which focuses on the sustainable measures to be implemented and details a package of measures designed to reduce the number of car borne journeys.

The main objective of the Travel Plan is to reduce car travel to and from the site by promoting and increasing awareness of alternative sustainable travel options e.g. walk, cycle, low emission vehicles and public transport; therefore, providing incentives and helping to minimise the potential barriers to using such modes. Where car travel does take place, an aim will be to limit the number of single occupancy car journeys.

A detailed Travel Plan shall be implemented as part of the proposed development.

10.6 Assessment of Environmental Impacts

10.6.1 Impact Assessment

Construction Phase

Dust

Dust emission magnitudes have been allocated to each of the four construction activities with reference to the criteria contained within the IAQM Guidance. Where details are unknown, dust emission classes have been assumed based on the development proposals and expected activities. Dust emissions classes and corresponding IAQM criteria are summarised in *Table 10.8* (it is noted that not all of the criteria need to be met for a particular class).

Table 10.8 - Dust Emissions Magnitudes

Source	Type
Demolition	Small (Total building volume <20,000 m^3)
Earthworks	Large (Total site area >10,000m^2)
Construction	Large (Total building volume >100,000m^3)
Trackout	Medium (10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50 m – 100 m)

The number of sensitive receptors identified and their distance from the site boundary or construction traffic route is shown in *Table 10.9*.

Table 10.9 - Sensitive Receptors	
Distance from Site Boundary / Traffic Route	**Approximate Number of Receptors**
<20m	20
20 to 50m	65 (including 20 future receptors)
50 to 100m	62 (including 40 future receptors)
100m to 350m	574 (including 500 future receptors
Trackout 350-500m	22

The sensitivity of the area (within 350m of the site boundary and within 50m of the expected route to be used by construction vehicles on the public highway, up to 500m from the site entrance) for each activity, has been determined based on the number of sensitive receptors, their proximity to the site and road, and with reference to the matrices contained within Tables 2, 3 and 4 of the IAQM Guidance. This is shown in *Table 10.10*.

Table 10.10 - Sensitivity of the Area		
Activity	**Dust Soiling**	**PM_{10} Effects (human health impacts)**
Demolition	Medium	-
Earthworks	High	High
Construction	High	High
Trackout	Medium	High

Table 10.11 contains a summary of the site's allocated dust risk categories with reference to the tables above and the matrices contained within Tables 6, 7, 8 and 9 of the IAQM Guidance.

Table 10.11 - Sensitive Receptors	
Activity	**Risk of Dust Impacts**
Demolition	Medium
Earthworks	High
Construction	High
Trackout	Medium

Without mitigation in place, the site has been designated as 'high' risk for earthworks and construction activities and medium risk for trackout activities.

Table 10.12 contains a summary of the site's dust impact risk with reference to the criteria set out in *Section 10.3.2*.

Table 10.12 – Risk of Impacts Prior to Mitigation		
Activity	**Dust Soiling**	**PM_{10} Effects (human health impacts)**
Demolition	Moderate	-
Earthworks	Substantial	Substantial
Construction	Substantial	Substantial
Trackout	Moderate	Substantial

All impact risks in *Table 10.12* are predicted with regard to the potential for dust nuisance complaints, rather than exceeding AQOs. All dust impacts are considered to be direct, temporary, short-term and reversible.

Following the implementation of mitigation measures detailed in the draft CEMP, the effects arising from the construction phase are considered to be **negligible**.

Construction Traffic

Temporary air quality affects associated with construction traffic will be no greater than those predicted for the development during the occupation phase (see subsequent sections).

As the development is not predicted to lead to new exposures to concentrations above the AQAL of 40 µg/m^3, resultant effects are predicted to be predominantly **negligible** and no greater than **minor adverse**.

Occupation Phase

Nitrogen Dioxide

The results in *Appendix 10.7* show that the proposed development will lead to increases in annual mean NO_2 concentrations at some sensitive receptors.

Development-related traffic in the 2026 'Do Something 1' scenario will result in **moderate adverse** effects at Receptors 8 and 22. However, it should be noted that this is due to annual mean NO_2 concentrations at each of these receptors being at or already exceeding the AQAL in the 'Do Minimum' scenario.

There will be **minor adverse** effects at Receptor 13, with **negligible** effects at all other receptors.

Particulate Matter

The results in *Appendix 10.7* show that the proposed development will have **negligible** effects on levels of particulate matter (PM_{10}) at all receptor locations.

10.6.2 Residual Impact Assessment

As no actionable mitigation measures have been proposed, all residual effects will be as set out in *Section 10.6.1*.

10.7 Cumulative Impact Assessment

10.7.1 Construction Phase

With suitable mitigation measures implemented for each development site, no significant cumulative effects are expected.

10.7.2 Occupation Phase

Nitrogen Dioxide

The results in *Appendix 10.7* show that the proposed development and development of the wider Keresley SUE will lead to increases in annual mean NO_2 concentrations at some sensitive receptors.

Traffic in the 2026 'Do Something 2' scenario will result in **substantial adverse** cumulative effects at Receptors 82 and 83. However, it should be noted that this is due to each of these receptors already exceeding the AQAL in the 'Do Minimum' scenario.

There will be **moderate adverse** cumulative effects at Receptors 14, 74, 79, and 105 and **minor adverse** effects at Receptors 13, 72, 73, 77, 78, 86 and 104.

Due to the provision of new highways infrastructure as part of the Keresley SUE, there will be **substantial beneficial** effects at Receptors BA1 and 8, **moderate beneficial** effects at Receptors 22, 29, 30, 31, 32, 33, 61, 62, 88 and 96, and **minor beneficial** effects at Receptors 2, 20, 27, 35, 52, 55, 56, 57, Site 3 and Site 6.

There will be **negligible** effects at all other receptors.

Particulate Matter

The results in *Appendix 10.7* show that the proposed development will have **negligible** cumulative effects on levels of particulate matter (PM_{10}) at all receptor locations.

10.8 Summary

An Air Quality assessment has been carried out to assess:

- The air quality effects of the proposed construction phase upon existing sensitive receptors; and
- The air quality effects of development-related traffic during the occupation-phase upon existing and proposed sensitive receptors.

During construction, the main potential air quality impacts are the generation of dust from on-site activities and increases in nitrogen dioxide (NO_2) and particulate matter (PM_{10}) concentrations from plant and road vehicles.

With respect to dust generation during construction, the site falls within a high risk category, as defined by the relevant guidance. On this basis, best practice mitigation measures are set out in the draft CEMP in *Appendix 4.1*.

Following the implementation of mitigation measures detailed in the draft CEMP, the effects arising from the construction phase are considered to be **negligible.**

Following occupation, the proposed development will lead to changes in traffic flows on local roads. The Air Quality Assessment has sought to examine the impact of development-related road traffic emissions upon existing and proposed receptors. The key traffic related pollutants that have been considered are NO_2 and PM_{10}.

The following scenarios have been included in the assessment:

- 2016 Base to enable verification of model performance against available NO2 monitoring data;
- 2026 'Do Something 1' (Do Minimum including the proposed development); and
- 2026 'Do Something 2' (Do Something 1 including proposed developments in the SUE i.e. cumulative assessment).

The results indicate that development-related traffic will result in **moderate adverse** effects at two receptors locations, **minor adverse** effects at a single receptor location, with the remaining 119 receptors experiencing **negligible** effects.

Mitigation measures have been identified to reduce residual effects as far as practicable, including:

- Extension/re-routing of existing bus services;
- Electric vehicle charging provision;
- Cycle parking/storage; and
- Travel Plan.

Potential cumulative effects with other developments within the wider Keresley SUE have been assessed by comparing the predicted 'Do Minimum' with the 'Do Something 2' (i.e. Do Something 1 including other proposed developments in the Keresley SUE) scenarios.

The assessment identified adverse cumulative effects at 13 receptor locations, beneficial cumulative effects at 22 receptor locations, with the remaining 87 receptors predicted to experience negligible cumulative effects.