UNITED BY OUR DIFFERENCE

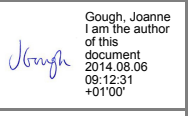
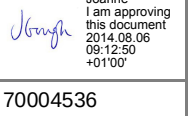
WSP

CHIPPING LANE, LONGRIDGE

Air Quality Assessment Report

06/08/2014

Quality Management

Issue/revision	Issue 1	Revision 1	Revision 2	Revision 3
Remarks	Draft	Revised Draft	Revised Draft	Final
Date	24th June 2014	8th July 2014	4th August 2014	6th August 2014
Prepared by	Joanne Gough	Joanne Gough	Joanne Gough	Joanne Gough
Signature				 Gough, Joanne I am the author of this document 2014.08.06 09:12:31 +01'00'
Checked by	Denise Evans	Denise Evans	Denise Evans	Denise Evans
Signature				 denise.evans@wspgroup.com I have reviewed this document 2014.08.06 09:24:34 +01'00'
Authorised by	Joanne Gough	Joanne Gough	Joanne Gough	Joanne Gough
Signature				 Gough, Joanne I am approving this document 2014.08.06 09:12:50 +01'00'
Project number	70004536	70004536	70004536	70004536
Report number				
File reference	M:\Environmental Planning\Projects\70004536 Chipping Lane\09 Report	M:\Environmental Planning\Projects\70004536 Chipping Lane\09 Report	M:\Environmental Planning\Projects\70004536 Chipping Lane\09 Report	M:\Environmental Planning\Projects\70004536 Chipping Lane\09 Report

CHIPPING LANE, LONGRIDGE

Air Quality Assessment Report

06/08/2014

Client

Barratt Homes
4 Brindley Road
City Park
Manchester
M16 9HQ

Consultant

WSP UK Ltd
Colston 33
Colston Avenue
Bristol
BS1 4UA

Tel: +44 (0)117 930 2000
Fax: +44 (0)117 929 4624

www.wspgroup.co.uk

Registered Address

WSP UK Limited
01383511
WSP House, 70 Chancery Lane, London, WC2A 1AF

Table of Contents

Executive Summary

WSP UK has been commissioned by Barratt Homes to carry out an assessment of the potential air quality impacts arising from the proposed development of up to 520 dwellings, a replacement cricket pitch and pavilion and a new primary school on land adjacent to Chipping Lane in Longridge.

This report presents the findings of the assessment, which addresses the potential air quality impacts during both the construction and operational phases of the proposed development. For both phases the type, source and significance of potential impacts were identified, and the measures that should be employed to minimise these proposed. The methodology followed in this study was discussed and agreed with the Environmental Health Officer of Ribble Valley Borough Council.

The assessment of construction phase impacts associated with fugitive dust and fine particulate matter (PM_{10}) emissions has been undertaken in line with the relevant Institute of Air Quality Management guidance. This identified that the Proposed Development is considered to be a High to Low Risk Site for dust deposition and Low Risk Site for PM_{10} concentrations. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and PM_{10} releases would be significantly reduced. The residual effects of the construction phase on air quality are considered to be negligible.

The assessment of the potential air quality impacts associated with traffic generated by the operational phase of the Proposed Development has been completed in line with published methodologies and technical guidance. The pollutants considered in this part of the assessment were nitrogen dioxide (NO_2) and PM_{10}, and a number of worst case assumptions were made in the calculations so that predicted concentrations can be considered to be conservative.

The results show that overall the Proposed Development would cause small to imperceptible increases in annual mean NO_2 concentrations and imperceptible increases in annual mean PM_{10} concentrations but would not cause any exceedences of the relevant UK Air Quality Strategy objectives. According to the assessment significance criteria, the residual effects of the Proposed Development are considered to range from slight adverse to negligible for NO_2 and negligible to neutral for PM_{10}. The slight adverse impacts predicted for concentrations of NO_2 are only predicted in two small areas towards the centre of Longridge. Overall, the impacts are considered to be negligible.

Based on the assessment results, it is considered that the development proposals comply with national and local planning policy for air quality, and air quality is considered to be a low priority within the planning process.

1 Introduction

1.1.1 WSP UK has been commissioned by Barratt Homes to carry out an assessment of the potential air quality impacts arising from the proposed development of up to 520 dwellings, a replacement cricket pitch and pavilion and a new primary school on land adjacent to Chipping Lane in Longridge, hereafter referred to as the 'Proposed Development' or 'Application Site'.

1.1.2 This report presents the findings of an assessment of the potential air quality impacts of the Proposed Development during both its construction and operational phases. For both phases, the type, source and significance of potential impacts are identified, and the measures that should be employed to minimise these are described.

1.1.3 A glossary of terms used in this report is provided in **Appendix A.**

2 Legislation, Policy & Guidance

2.1 Air Quality Legislation & Policy

2.1.1 A summary of the relevant air quality legislation and policy is provided below.

UK Air Quality Strategy

2.1.2 The Government's policy on air quality within the UK is set out in the Air Quality Strategy for England, Scotland, Wales and Northern Ireland (AQS) published in July 2007 (Ref. 1). The AQS provides a framework for reducing air pollution in the UK with the aim of meeting the requirements of European Union legislation and international commitments.

2.1.3 The AQS also sets standards and objectives for nine key air pollutants to protect health, vegetation and ecosystems. These are benzene (C_6H_6), 1,3 butadiene (C_4H_6), carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO_2), particulate matter (PM_{10} and $PM_{2.5}$), sulphur dioxide (SO_2), ozone (O_3), and polycyclic aromatic hydrocarbons (PAHs). For construction activities and road traffic emissions, which are the focus of this assessment, the main pollutants of concern are nitrogen dioxide and PM_{10}. The standards and objectives for these pollutants are given in **Appendix B.**

2.1.4 The air quality standards are levels recommended by the Expert Panel on Air Quality Standards (EPAQS) and the World Health Organisation (WHO) with regards to current scientific knowledge about the effects of each pollutant on health and the environment.

2.1.5 The air quality objectives are medium-term policy based targets set by the Government which take into account economic efficiency, practicability, technical feasibility and timescale. Some objectives are equal to the EPAQS recommended standards or WHO guideline limits, whereas others involve a margin of tolerance, i.e. a limited number of permitted exceedences of the standard over a given period.

2.1.6 For some pollutants, (e.g. NO_2), there is both a long-term (annual mean) standard and a short-term standard. In the case of NO_2, the short-term standard is for a 1-hour averaging period, whereas for PM_{10} it is for a 24-hour averaging period. These periods reflect the varying impacts on health of differing exposures to pollutants, for example temporary exposure on the pavement adjacent to a busy road, compared with the exposure of residential properties adjacent to a road.

2.1.7 The AQS contains a framework for considering the effects of a finer group of particles known as '$PM_{2.5}$' as there is increasing evidence that this size of particles can be more closely associated with observed adverse health effects than PM_{10}.

Air Quality Regulations

2.1.8 Many of the objectives in the AQS have been made statutory in England with the Air Quality (England) Regulations 2000 (Ref. 2) and the Air Quality (England) (Amendment) Regulations 2002 (Ref.3) for the purpose of Local Air Quality Management (LAQM).

2.1.9 These Regulations require that likely exceedences of the AQS objectives are assessed in relation to:

"…the quality of air at locations which are situated outside of buildings or other natural or man-made structures, above or below ground, and where members of the public are regularly present…"

2.1.10 The Air Quality Standards Regulations 2010 (Ref.4) transpose the European Union Ambient Air Quality Directive (2008/50/EC) (Ref. 5) into law in England. This Directive sets legally binding limit values for concentrations in outdoor air of major air pollutants that impact public health such as PM_{10}, $PM_{2.5}$ and NO_2. The limit values for NO_2 are the same concentration levels as the AQS objectives, but applied from 2010. The limit values for PM_{10} and $PM_{2.5}$ are also the same concentration levels as the AQS objectives, but apply from 2005 for PM_{10} and will apply from 2015 for $PM_{2.5}$. It should be noted that currently there is no requirement for local authorities to assess $PM_{2.5}$ concentrations as part of their statutory obligations.

2.1.11 The 2010 Regulations also incorporate the European Union's 4th Air Quality Daughter Directive (2004/107/EC) (Ref. 6), which sets targets for levels in outdoor air of certain toxic heavy metals and PAHs.

Environmental Protection Act 1990 - Control of dust and particulates associated with construction

2.1.12 Section 79 of the Environmental Protection Act 1990 (Ref. 7) gives the following definitions of statutory nuisance relevant to dust and particles:

'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'

2.1.13 Following this, Section 80 says 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.

2.1.14 There are no statutory limit values for dust deposition above which 'nuisance' is deemed to exist. Nuisance is a subjective concept and its perception is highly dependent upon the existing conditions and the change which has occurred.

Environment Act 1995

2.1.15 Under Part IV of the Environment Act 1995 (Ref. 8), local authorities must review and document local air quality within their area by way of staged appraisals and respond accordingly, with the aim of meeting the air quality objectives defined in the Regulations. Where the objectives are not likely to be achieved, an authority is required to designate an Air Quality Management Area (AQMA). For each AQMA the local authority is required to draw up an Air Quality Action Plan (AQAP) to secure improvements in air quality and show how it intends to work towards achieving air quality standards in the future.

2.2 Planning Policy

2.2.1 A summary of the relevant national and local planning policy relevant to the Proposed Development and air quality is provided below.

National Planning Policy

National Planning Policy Framework

2.2.2 The Government's overall planning policies for England are described in the National Planning Policy Framework (Ref. 9). This document also outlines the means by which Government intends to apply these policies at various levels to achieve its aim of contributing to sustainable development. The Framework acknowledges the importance of appropriate and robust planning at a local level and thus promotes opportunities for communities to engage in plan making at a neighbourhood level. The core underpinning principle of the framework is the presumption in favour of sustainable development, defined as:

'Development that meets the needs of the present without compromising the ability of future generations to meet their own needs'

2.2.3 One of the 12 core planning principles in the NPPF is that planning should 'contribute to conserving and enhancing the natural environment and reducing pollution.'

2.2.4 In relation to air quality, the following paragraphs are relevant:

- Paragraph 109, which states *'The planning system should contribute to and enhance the natural and local environment by:…preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water, or noise pollution..';*
- Paragraph 110, which states *'In preparing plans to meet development needs, the aim should be to minimise pollution and other adverse effects on the local and natural environment. Plans should allocate land with the least environmental or amenity value, where consistent with other policies in this Framework.';*
- Paragraph 122, which states *'…local planning authorities should focus on whether the development itself is an acceptable use of the land, and the impact of the use, rather than the control of processes or emissions themselves where these are subject to approval under pollution control regimes. Local planning authorities 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';*
- Paragraph 124, which states *'Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan'; and*
- Paragraph 203, which states *'Local Planning authorities should consider where otherwise unacceptable development could be made acceptable though the use of conditions or planning obligations. Planning obligations should only be used where it is not possible to address unacceptable impacts through a planning condition.'*

Local Planning Policy

Ribble Valley Borough Council Core Strategy 2008 - 2028

2.2.5 In this document (Ref. 10), Policy DMG1: General Considerations states that

'10.4 In determining planning applications, all development must:….Consider air quality and mitigate adverse impacts where possible.'

2.3 Guidance

2.3.1 A summary of the publications referred to in the undertaking of this assessment is provided below.

Local Air Quality Management Review and Assessment Technical Guidance

2.3.2 The Department for Environment, Food and Rural Affairs (DEFRA) has published technical guidance for use by local authorities in their review and assessment work (Ref. 11). This guidance, referred to in this document as LAQM.TG(09), has been used where appropriate in the assessment presented herein.

Development Control: Planning for Air Quality

2.3.3 This air quality guidance produced by Environmental Protection UK (EPUK) (Ref. 12) offers comprehensive advice on: when an air quality assessment may be required; what should be included in an assessment; how to determine the significance of any air quality impacts associated with a development; and, the possible mitigation measures which may be implemented to minimise these impacts.

Guidance on the Assessment of Dust from Demolition and Construction

2.3.4 This document (Ref. 13) published by the Institute of Air Quality Management (IAQM) was produced to provide guidance to developers, consultants and environmental health officers on how to assess the impacts arising from construction activities. The emphasis of the methodology is on classifying sites according to the risk of impacts (in terms of dust nuisance, PM_{10} impacts on public exposure and impact upon sensitive ecological receptors) and to identify mitigation measures appropriate to the level of risk identified.

National Planning Practice Guidance – Air Quality

2.3.5 This guidance (Ref. 14) provides a number of guiding principles on how the planning process can take into account the impact of new development on air quality, and explains how much detail air quality assessments need to include for proposed developments, and how impacts on air quality can be mitigated. It also provides information on how air quality is taken into account by Local Authorities in both the wider planning context of Local Plans and neighbourhood planning, and in individual cases where air quality is a consideration in a planning decision.

3 Methodology

3.1 Scope

3.1.1 The scope of the assessment has been determined in the following way:

- consultation with the Environmental Health Officer (EHO) of Ribble Valley Borough Council (RVBC) to discuss the availability and location of local monitoring data, to agree the scope of the assessment and the methodology to be applied;
- review of RVBC's latest review and assessment reports (Ref. 15) and air quality data for the area surrounding the site, including data from DEFRA (Ref. 16), and the Environment Agency (EA) (Ref. 17);
- desk study to confirm the locations of nearby existing receptors that may be sensitive to changes in local air quality and a review of the masterplan for the Proposed Development to establish the locations of new sensitive receptors; and
- review of the traffic data provided by Vectos, which have been used as an input to the air quality assessment.

3.1.2 The scope of the assessment includes consideration of the potential impacts on local air quality resulting from:

- dust and particulate matter generated by on-site activities during the construction phase;
- increases in pollutant concentrations (namely NO_2 and PM_{10}) as a result of exhaust emissions arising from construction traffic and plant; and
- increases in pollutant concentrations (namely NO_2 and PM_{10}) as a result of exhaust emissions from road traffic generated by the operation of the Proposed Development.

3.1.3 In pre-application advice provided by RVBC on 16th April 2014, the Council said that '*The proximity to the farm [Willow Park Farm] could also raise odour concerns, depending on the nature of the holding, which will require clarification in any planning application.*'

3.1.4 Therefore, WSP spoke with the owner of Willow Park Farm on 8th July 2014 and confirmed that the farm reared sheep and beef for slaughter. As part of the farming activities undertaken, silage is produced but this is stored in bags and will therefore not create any odourous emissions.

3.1.5 In addition, manure produced by the farm is stored on site for spreading on the adjacent fields in Spring. Whilst the storage of manure itself does not generate any significant odours, its spreading on nearby fields could cause odour that may be detected on the Proposed Development site. However, given the short term nature of this activity and the lack of any complaints made by existing residents to RVBC about odourous emissions generated by the Farm, it is considered that the potential for new residents to be adversely affected by odour is not significant requiring consideration as part of this assessment.

3.2 Methodology

Construction Phase

3.2.1 An assessment of the likely significant impacts on local air quality due to the generation and dispersion of dust and PM_{10} during the construction phase has been undertaken using: the relevant assessment methodology published by the IAQM; the available information for this phase of the Proposed Development provided by the Client and Project Team; and, professional judgement.

3.2.2 The IAQM methodology assesses the risk of potential dust and PM_{10} impacts from the following four sources: demolition; earthworks; general construction activities and track-out. It takes into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to an increase in dust and PM_{10} levels to assign a level of risk. Risks are described in terms of there being a low, medium or high risk of dust impacts. Once the level of risk has been ascertained, then site specific mitigation proportionate to the level of risk is identified, and the significance of residual effects determined. A summary of the IAQM assessment methodology is provided in **Appendix C**.

3.2.3 In addition to impacts on local air quality due to on-site construction activities, exhaust emissions from construction vehicles and plant may have an impact on local air quality adjacent to the routes used by these vehicles to access the Application Site and in the vicinity of the Application Site itself. As information on the number of vehicles and plant associated with the each part of the construction phase is not available at the time of writing, a qualitative assessment of their impact on local air quality has been undertaken using professional judgement and by considering the following:

- the number and type of construction traffic and plant likely to be generated by this phase of the Proposed Development;
- the number and proximity of sensitive receptors to the Application Site and along the likely routes to be used by construction vehicles; and
- the likely duration of the construction phase and the nature of the construction activities undertaken.

Operational Phase

3.2.4 Of the pollutants included in the AQS, concentrations of NO_2 and PM_{10} have been considered in this part of the assessment as road traffic is a major source of both pollutants and there is a risk that their concentrations may exceed the objectives in urban locations, such as the location of the Proposed Development Site.

3.2.5 For the prediction of impacts due to emissions arising from road traffic during the operation of the Proposed Development, the advanced dispersion model ADMS Roads (version 3.2) has been used. This model uses detailed information regarding traffic flows on the local road network, surface roughness, and local meteorological conditions to predict pollutant concentrations.

3.2.6 A summary of the traffic data and pollutant emission factors used in the assessment can be found in **Appendix D**. It includes details of Annual Average Daily Traffic flows (AADT), vehicle speeds (kph) and the percentage of Heavy Duty Vehicles (HDVs) for the local road network in all assessment years considered.

3.2.7 Meteorological data, such as wind speed and direction, is used by the model to determine pollutant transportation and levels of dilution by the wind. Meteorological data used in the model was obtained from the Met Office observing station at Manchester. This station is considered to provide data representative of the meteorological conditions at the Proposed Development site. The meteorological data used for this assessment was from 2012[1].

3.2.8 For the assessment, four scenarios were modelled. These scenarios are as follows:

- 2012 "model verification";
- 2014 "baseline";
- 2025 "without development"; and
- 2025 "with development".

3.2.9 2012 is the most recent year for which traffic data is available for model verification. 2014 is the current year so this year has been used as the baseline year for this assessment. 2025 is the anticipated opening year of the Proposed Development.

3.2.10 The traffic flows for the "without development" scenario includes flows for committed developments in the locality of the Application Site but do not include any contribution to road traffic from the Proposed Development itself. The traffic flows for the "with development" scenario includes contributions to road traffic from the Proposed Development itself and the following committed developments:

- Fox Strategic Land & Property, Whittingham Road, Longridge (200 dwellings);
- David Wilson Homes, Whittingham Road, Whittingham (78 dwellings);
- Residential and Employment Site, Whittingham Hospital;
- Miller Homes, Land of Preston Road (58 dwellings);
- Spout Farm, Preston (32 dwellings);
- 2011 Application, Land bound by Dilworth Lane (49 dwellings);
- Inglewhite Road/Fox (190 dwellings); and
- Chapel Hill (52 dwellings).

3.2.11 Vehicle emission factors for use in the assessment have been obtained using the Emission Factor Toolkit (EFT) version 6.0.1 (Ref. 18) (published in July 2014) available on the DEFRA website. The EFT allows for the calculation of emission factors arising from road traffic for all years between 2008 and 2030. For the predictions of future year emissions, the toolkit takes into account factors such as anticipated advances in vehicle technology and changes in vehicle fleet composition, such that vehicle emissions are assumed to reduce over time. However, there is currently some uncertainty over how representative the future predictions are. To address this uncertainty, the emission factors for the verification year (2012) were used for all of the assessment scenarios. This represents a worst-case approach to the assessment as requested by the EHO at RVBC.

[1] At the request of the EHO at RVBC, modelling has also been undertaken using meteorological data from Blackpool for 2012 to provide a sensitivity test. The results predicted using this meteorological dataset are not discussed in this report, however they are provided in Appendix H. This is because the verification factor calculated for this dataset was higher than the one calculated using the Manchester meteorological dataset, indicating the model performs better using the latter dataset.

Selection of background concentrations

3.2.12 Background pollutant concentrations used in the assessment have been taken from the DEFRA website, where background concentrations of those pollutants included within the AQS have been mapped at a grid resolution of 1x1km for the whole of the UK. For NO_2, oxides of nitrogen (NO_x) (which is required in the calculation of NO_2 concentrations), and PM_{10}, estimated concentrations are available for all years between 2010 and 2030. Inherent within the background maps is the assumption that background concentrations will improve (i.e. reduce) over time. However, many local authorities are finding that the results of their local monitoring do not always support this assumption, with many areas showing that pollutant concentrations have remained fairly stable over recent years. For the purposes of the assessment, 2012 background concentrations have been used for all assessment scenarios. This approach was agreed in consultation with the EHO of RVBC. Further details on the background concentrations are provided in Section Four of this report.

3.2.13 It should be noted that for NO_x and PM_{10}, the background maps present both the 'total' estimated background concentrations and the individual contributions from a range of emission sources (for example, motorways, aircraft, domestic heating etc.). When detailed modelling of an individual sector is required as part of an air quality assessment, the respective contribution can be subtracted from the overall background estimate to avoid the potential for 'double-counting'. For this assessment, the total background concentrations have been used to provide a worst case approach, and in the case of the modelling used for the 2012 'verification' scenario, because the roads modelled did not lie within the grid square of background concentration data used.

Model verification and processing of results

3.2.14 The ADMS Roads advanced dispersion model has been widely validated for this type of assessment and is considered to be fit for purpose.

3.2.15 Model validation undertaken by the software developer will not have included validation in the vicinity of the Proposed Development. To determine the performance of the model at a local level, a comparison of modelled results with local monitoring data at relevant locations was undertaken. This process of verification aims to minimise modelling uncertainty and systematic error by correcting modelled results by an adjustment factor to gain greater confidence in the final results.

3.2.16 RVBC do not undertake air quality monitoring in Longridge. However, they currently undertake diffusion tube monitoring in Clitheroe and Whalley. As road traffic data is unavailable from the Department for Transport website for Whalley, model verification has been undertaken using data from two tubes adjacent to roads for which traffic data is available for in Clitheroe. The data used in the model verification from these monitoring sites is shown in **Table 1**.

Table 1 Local monitoring data sources suitable for model verification

Location & Site Classification	O.S. Grid Reference	2012 Monitored NO_2 Concentrations ($\mu g/m^3$)
Royal British Legion	374234, 441291	47.0
Whalley Road	374213, 441240	43.4

3.2.17 These tubes are located between 1 - 2 m from the nearest road edge, which means that there use in the verification process is not ideal as the majority of assessment receptors are located at distances of more than 2m away from the nearest road edge and the model may perform differently at varying distances from the road edge. Using these diffusion tubes for verification is likely to result in an over prediction of total pollutant concentration at the assessment receptors.

3.2.18 Model verification has been undertaken following the methodology specified in Annex 3 of LAQM.TG(09) using the NO_x:NO_2 calculator (version 4.1, released in July 2014) available from the DEFRA website to calculate the roadside NO_x component of the annual mean NO_2 concentrations measured at the monitoring sites listed in the table above. Details of the verification calculations are presented in **Appendix E**.

3.2.19 A factor of **3.16** was obtained during the verification process and this factor has been applied to the modelled NO_x roads component. Following model verification and adjustment, the modelled road contribution to NO_x concentrations were converted to annual mean NO_2 concentrations using the methodology given in LAQM.TG(09) and the NO_x:NO_2 calculator.

3.2.20 Local monitoring data are not available for concentrations of PM_{10}, and as such, final modelling results for this pollutant have been adjusted using the factor calculated for adjusting the modelled road NO_x concentrations. This approach is considered to be appropriate according to guidance given in LAQM.TG(09).

3.2.21 For PM_{10}, the adjusted modelled road contribution to annual mean PM_{10} concentrations were added to the relevant background concentrations, which were then used to calculate the number of exceedences of the 24-hour mean objective for direct comparison with the relevant AQS objective, following the methodology given in LAQM.TG(09).

3.2.22 LAQM.TG(09) advises that exceedences of the 1 hour mean NO_2 objective is unlikely to occur where annual mean concentrations are below 60µg/m^3, and provides guidance on the approach that should be taken if either measured or predicted annual mean NO_2 concentrations are 60µg/m^3 or above.

3.2.23 Predicted concentrations have been compared against the relevant current statutory standards and objectives set out in **Appendix B**.

3.3 Significance Criteria

Construction Phase

3.3.1 The IAQM assessment methodology recommends that significance criteria is only assigned to the identified risk of dust impacts occurring from a construction activity with appropriate mitigation measures in place. For almost all construction activities, the application of effective mitigation should prevent any significant effects occurring to sensitive receptors and therefore the residual effect will normally be negligible. For the assessment of the impact of emissions from plant and construction vehicles accessing and leaving the Site on local air quality, the significance of residual effects have been determined using professional judgement and the principles of the significance criteria provided in the guidance published by EPUK and presented in **Appendix G**.

Operational Phase

3.3.2 The impacts of traffic associated with the Proposed Development on local air quality once operational have been evaluated against the significance criteria published by EPUK.

3.3.3 The approach outlined in the EPUK guidance considers the change in pollution concentrations and the overall pollutant concentrations in the area, as compared to the relevant air quality standard. The magnitude of impact is determined quantitatively by establishing the change in pollutant concentrations at each of the selected receptors, as predicted by the dispersion modelling. Full details of the significance criteria, which are applicable to concentrations of NO_2 and PM_{10}, are provided in **Appendix G**.

3.3.4 The EPUK guidance does not provide criteria for determining the significance of the impacts of hourly mean NO_2 concentrations as a result of the Proposed Development. The significance of the impact on concentrations of this pollutant has therefore been determined qualitatively using professional judgement and the principles of the EPUK significance criteria.

3.3.5 In addition to these quantitative criteria, the EPUK guidance outlines a method that uses textual descriptors to identify the differing levels of relative priority that should be afforded to the air quality considerations of a development proposal in the planning process. A summary of the method is given in **Table 2**.

Table 2 Summary of method for Assessing the Significance of Air Quality in the Planning Process

Impacts of Development	Outcome
Development would lead to a breach or significant(1) worsening of a breach of an EU limit value; cause a new breach to occur, or introduce of new exposure into an exceedence area.	Air Quality an overriding consideration.
Lead to a breach or significant (1) worsening of a breach of an AQ Objective, or cause a new AQMA to be declared, or introduce new exposure into an area of exceedence (2).	Air Quality a high priority consideration.
Development would interfere significantly with or prevent the implementation of actions within an AQ action plan	Air Quality a high priority consideration.
Development would interfere significantly with the implementation of a local AQ strategy.	Air Quality a medium priority consideration.
Development would lead to a significant increase in emissions, degradation in air quality or increase in exposure, below the level of a breach of an objective.	Air Quality a medium priority consideration.
None of the above.	Air Quality a low priority consideration.

(1) Where the term significant is used, it will be based on the professional judgement of the Local Authority officer.

(2) This could include the expansion of an existing AQMA or introduction of new exposure to cause a new AQMA to be declared. Where new exposures is introduced this should be with reference to the exceedence area, and not the AQMA boundary.

3.4 Selection of Sensitive Receptors

3.4.1 Sensitive locations are those places where the public or sensitive ecological habitats may be exposed to pollutants resulting from activities associated with the Proposed Development. These will include locations sensitive to an increase in dust deposition and PM_{10} exposure as a result of on-site construction activities, and locations sensitive to exposure to gaseous pollutants emitted from the exhausts of construction and operational traffic associated with the Proposed Development.

3.4.2 The IAQM assessment methodology is undertaken where there are: 'human receptors' within 350m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or 'ecological receptors' within 50m of the site boundary, or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s). It is within these distances that the impacts of dust soiling and increased PM_{10} in the ambient air will have the most significant impact on sensitive receptors.

3.4.3 There are no ecological receptors within the above specified distances, or adjacent to roads affected by changes in traffic flows, and therefore the assessment of construction and operational phase impacts will focus on the potential effects to human receptors only.

3.4.4 In terms of locations that are sensitive to gaseous pollutants emitted from engine exhausts (road vehicles and construction plant), these will include places where members of the public are likely to be regularly present and will be exposed to pollution over the period of time prescribed in the AQS.

3.4.5 For instance, on a footpath where exposure will be transient (for the duration of passage along that path) comparison with a short-term standard (i.e. 1 hour mean) may be relevant. In a school or adjacent to a private dwelling, where exposure may be for longer periods, comparison with a long-term standard (such as 24 hour mean or annual mean) may be more appropriate. In general terms, long-term standards are lower than short-term standards owing to the chronic health effects associated with exposure to low level pollution for longer periods of time, and this is the case for NO_2; for PM_{10}, however, the daily mean objective is more stringent. Box 1.4 of LAQM.TG(09) provides examples of the locations where the air quality objectives should/should not apply, and is reproduced below as **Table 3**.

Table 3 Examples of where the air quality objectives should/should not apply

Averaging Period	Objectives should apply at:	Objectives should generally not apply at:
Annual mean	All locations where members of the public might be regularly exposed. Building facades of residential properties, schools, hospitals, care homes etc.	Building facades of offices or other places of work where members of the public do not have regular access. Hotels, unless people live there as their permanent residence. Gardens of residential properties. Kerbside sites (as opposed to locations at the building façade), or any other locations where public exposure is expected to be short term.
24-hour mean	All locations where the annual mean objective would apply, together with hotels. Gardens of residential properties.	Kerbside sites (as opposed to locations at the building façade), or any other locations where public exposure is expected to be short term.
1-hour mean	All locations where the annual mean and 24 -hour mean objectives apply. Kerbside sites (for example, pavements of busy shopping streets) Those parts of car parks, bus stations and railway stations etc. which are not fully enclosed, where members of the public might reasonably be expected to spend one hour or more. Any outdoor locations where members of the public might reasonably expected to spend one hour or longer.	Kerbside sites where the public would not be expected to have regular access.
15-min mean	All locations where members of the public might reasonably be exposed for a period of 15 minutes or longer.	

3.4.6 To complete the assessment of operational phase impacts, a number of 'receptors' representative of locations of relevant public exposure were identified at which pollution concentrations were predicted. Receptors have been located adjacent to the roads that are likely to experience the greatest change in traffic flows or composition, and therefore NO_2 and PM_{10} concentrations, as a result of the Proposed Development. Concentrations were predicted at a height of 1.5m in order to represent exposure at ground floor level.

3.4.7 The locations of the assessment receptors are shown on **Figure 1** (page 28).

4 Baseline Conditions

4.1 RVBC's Review & Assessment of Air Quality

4.1.1 RVBC has not designated any AQMAs in Longridge or in the vicinity, and currently do not undertake any air quality monitoring there.

4.2 Local Emission Sources

4.2.1 The Proposed Development site is located in an area where air quality is mainly influenced by emissions from road transport using Chipping Lane, Halfpenny Lane and Inglewhite Road.

4.2.2 There are no industrial pollution sources in the immediate vicinity of the site that will influence the local air quality.

4.3 Background Air Quality Data

4.3.1 **Table 4** shows the background concentrations of NO_2 and PM_{10} that were used in the assessment.

Table 4 Background Concentrations used in the Assessment (µg/m^3)

Pollutant	/Receptor/DEFRA grid square	2012 Background Concentration
NO_x	All assessment receptors shown on Figure 1. (360500, 437500)	16.08
NO_2		11.79
PM_{10}		14.28
NO_x	RVBC's diffusion tubes used in the model verification process. (373500, 441500)	15.27
NO_2		11.23
PM_{10}		Not required

4.3.2 The data in the table above shows that background concentrations in Longridge are currently well below the relevant AQS objectives.

5 Assessment of Impacts

5.1 Construction Phase

Dust and PM_{10} arising from on-site activities

5.1.1 During the construction phase, there will be a number of activities which have the potential to generate and/or re-suspend dust and PM_{10}.

5.1.2 Dust comprises particles typically in the size range 1-75 micrometres (µm) in aerodynamic diameter and is created through the action of crushing and abrasive forces on materials. The larger dust particles fall out of the atmosphere quickly after initial release and therefore tend to be deposited in close proximity to the source of emission. Dust therefore, is unlikely to cause long-term or widespread changes to local air quality; however, its deposition on property and cars can cause 'soiling' and discolouration. This may result in complaints of nuisance through amenity loss or perceived damage caused, which is usually temporary.

5.1.3 The smaller particles of dust (typically less than 10µm in aerodynamic diameter) are known as particulate matter (PM_{10}) and represent only a small proportion of total dust released. As these particles are at the smaller end of the size range of dust particles they remain suspended in the atmosphere for a longer period of time than the larger dust particles, and can therefore be transported by wind over a wider area.

5.1.4 Significant increases in dust deposition levels and particulate matter concentrations can also affect sensitive vegetation by blocking stomata, reducing photosynthesis and plant growth.

5.1.5 Construction activities that have the potential to generate and/or re-suspend dust and PM_{10}. include:

- Site clearance and preparation;
- Preparation of temporary access/egress to the Application Site and haulage routes;
- Earthworks;
- Materials handling, storage, stockpiling, spillage and disposal;
- Movement of vehicles and construction traffic within the Application Site (including excavators and dumper trucks);
- Use of crushing and screening equipment/plant;
- Exhaust emissions from site plant, especially when used at the extremes of their capacity and during mechanical breakdown;
- Construction of buildings, roads and areas of hardstanding alongside fabrication processes;
- Internal and external finishing and refurbishment; and
- Site preparation and restoration after completion.

5.1.6 The majority of the releases are likely to occur during the 'working week'. However, for some potential release sources (e.g. exposed soil produced from significant earthwork activities) in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day over the period during which such activities are to take place.

Assessment of Potential Dust Emission Magnitude

5.1.7 The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM_{10} sources: demolition; earthworks; construction; and, trackout. The findings of the assessment are presented below.

Demolition

5.1.8 As the Site is a greenfield site, no demolition activities will occur as part of the construction phase of the Proposed Development. Therefore, consideration of the impact of this source on dust soiling and ambient PM_{10} is not required.

Earthworks

5.1.9 The total area of the Application Site is more than 10,000m^2, the soil type is clay and therefore potentially dusty, and the total material that will be moved is estimated to be more between 20,000 and 100,000 tonnes, with less than 5 heavy earth moving vehicles active at any one time. Therefore, the potential dust emission magnitude is considered to be **large** to **medium** for earthwork activities

Construction

5.1.10 The total volume of buildings to be constructed on the Application Site will be between 25,000m^3 and 100,000m^3 using materials that have a low potential for dust release. Therefore, the potential dust emission magnitude is considered to be **medium** for construction activities.

Trackout

5.1.11 Based on the traffic information provided by Barratt Homes, there will be less than 10 HDV (>3.5t) outward movements in any one day travelling on surface materials with low potential for dust release. Due to the size of the site, it is also assumed that the length of unpaved roads within Application Site will be less than 50m. Therefore, the potential dust emission magnitude is considered to be **small** for trackout.

5.1.12 **Table 5** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

Table 5 Potential Dust Emission Magnitude

Activity	Dust Emission Magnitude
Demolition	N/A
Earthworks	Large - Medium
Construction Activities	Medium
Trackout	Small

Assessment of Sensitivity of the Study Area

5.1.13 Following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM_{10} has been derived for each of the construction activities considered. The results are shown in **Table 6**.

Table 6 Sensitivity of the Study Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	High	High	High
Human Health	N/A	Low	Low	Low

Risk of Impacts

5.1.14 The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 7** below provides a summary of the risk of dust impacts for the Proposed Development. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 7 Summary Dust Risk Table to Define Site-Specific Mitigation

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	N/A	High to medium	Medium	Low
Human Health	N/A	Low	Low	Low

Construction Vehicles & Plant

5.1.15 The greatest impact on air quality due to emissions from vehicles and plant associated with the construction phase will be in the areas immediately adjacent to the site access. It is anticipated that construction traffic will access the site via Chipping Lane.

5.1.16 Based on the current local air quality in the area, the proximity of sensitive receptors to the roads likely to be used by construction vehicles, and the likely numbers of construction vehicles and plant that will be used, the impacts are therefore considered to be of **negligible** significance according to the EPUK significance criteria.

5.2 Operation Phase

5.2.1 Full results of the dispersion modelling are presented in **Appendix G** and a summary is provided below.

Annual Mean NO_2 Concentrations

5.2.2 The objective for annual mean NO_2 concentrations is 40µg/m^3 to be achieved by the end of 2005 and thereafter. The results of the assessment show that, in the 2014 baseline case, concentrations meet the objective at all of the existing receptor locations. The highest predicted concentration, at a location where the objective applies, is 34.09µg/m^3, predicted at a residential property adjacent to Derby Street (receptor 29).

5.2.3 By 2025, the opening year of the Proposed Development, concentrations are again predicted to meet the objective at all of the existing receptor locations where the objective would apply. The highest concentrations predicted at a location where the objective will apply are 36.96µg/m^3 in the "without development" scenario and 37.87µg/m^3 in the "with development" scenario. These concentrations were again predicted at a residential property adjacent to Derby Street (receptor 29).

5.2.4 Traffic associated with the Proposed Development is predicted to result in: a medium increase in annual mean NO_2 concentrations at one existing receptor (Alston Arms P.H receptor number 3); and small to imperceptible increases at the remaining existing receptors. The greatest increase in concentrations at an existing receptor due to the proposals is 2.32µg/m^3 predicted at the Alston Arms P.H on the corner of Chipping Lane and Inglewhite Road (receptor number 3).

5.2.5 The impact of the Proposed Development on annual mean NO_2 concentrations at all but four of the existing sensitive receptors where the objective will apply is considered to be **negligible**. The four existing receptors, at which **slight adverse** impacts are predicted, are located adjacent to Derby Street (receptor numbers 29, 30 and 31) and Inglewhite Road (receptor number 32).

Hourly Mean NO_2 Concentrations

5.2.6 The annual mean NO_2 concentrations predicted by the model were all below 60µg/m^3, and therefore exceedences of the hourly mean NO_2 concentration objective are unlikely to occur. The impact of the Proposed Development on hourly mean NO_2 concentrations at existing sensitive receptors is considered to be **negligible**.

Annual Mean PM_{10} Concentrations

5.2.7 The objective for annual mean PM_{10} concentrations is a concentration of 40µg/m^3 to be achieved by the end of 2004 and thereafter. The results of the assessment show that, in the 2014 baseline case, concentrations meet the objective at all of the existing receptor locations. The highest predicted concentration, at a location where the objective will apply, is 18.31/m^3, predicted at a residential property adjacent to Inglewhite Road (receptor 32).

5.2.8 By 2025, the opening year of the Proposed Development, concentrations are again predicted meet the objective at all of the existing receptor locations. The highest concentrations predicted at a location where the objective will apply are 19.16µg/m^3 in the "without development" scenario and 19.56µg/m^3 in the "with development" scenario. These concentrations were again predicted at a residential property adjacent to Inglewhite Road (receptor 32).

5.2.9 Traffic associated with the Proposed Development is predicted to result in a small increase in annual mean NO_2 concentrations at one existing receptor (Alston Arms P.H receptor number 3) and an imperceptible increase at the remaining existing receptors. The greatest increase in concentrations at an existing receptor due to the proposals is 0.49µg/m^3 predicted at the Alston Arms P.H on the corner of Chipping Lane and Inglewhite Road (receptor number 3).

5.2.10 The impact of the Proposed Development on annual mean PM_{10} concentrations at existing sensitive receptors is considered to be **negligible**.

Daily Mean PM_{10} Concentrations

5.2.11 The objective for 24 hourly mean PM_{10} concentrations is 50µg/m^3 to be exceeded no more than 35 times a year by the end of 2004 and thereafter. The results of the dispersion modelling show that there is one day of exceedence in 2014 and a maximum of two days of exceedence in 2025, both with and without the development.

5.2.12 The Proposed Development will lead to an increase in the number of days of exceedence by one day and two of the existing receptors where the objective will apply with no change elsewhere, and therefore, according to the EPUK significance criteria, the effect of the Proposed Development on daily mean PM_{10} concentrations is **negligible** to **neutral**.

6 Mitigation & Residual Effects

6.1 Construction Phase

6.1.1 Based on the assessment results, the mitigation measures to be implemented to eliminate the identified risk of dust impacts associated with the various activities of the construction phase of the Proposed Development are listed below.

General Communication

- A stakeholder communications plan that includes community engagement before work commences on site should be developed and implemented.
- The name and contact details of person(s) accountable for air quality and dust issues needs to be displayed 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.

General Dust Management

- A Dust Management Plan (DMP), which may include measures to control other emissions, in addition to the dust and PM_{10} mitigation measures given in this report, should be developed and implemented, and approved by the Local Authority.

Site Management

- Record all dust and air quality complaints and identify the cause(s). Take appropriate measures to reduce emissions in a timely manner, and record the measures taken.
- Make the complaints log available to the local authority when requested.
- Any exceptional incidents that cause dust and/or air emissions, either on- or offsite need to be recorded, and the action taken to resolve the situation recorded in the log book.

Monitoring

- Daily on-site and off-site inspections must be undertaken, where receptors (including roads) are nearby to monitor dust. The inspection results should be recorded and made available to the local authority when asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and window sills within 100m of site boundary, with cleaning to be provided if necessary.
- Regular site inspections to monitor compliance with the DMP must carried out, inspection results recorded, and an inspection log made 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.

Preparing and maintaining the site

- Plan site layout so that machinery and dust causing activities are located away from receptors, as far as is possible.
- 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 re-used on-site cover appropriately.
- Cover, seed or fence stockpiles to prevent wind whipping

Operating vehicle/machinery and sustainable travel

- Ensure all vehicles 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.
- Impose and signpost a maximum-speed-limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures provided, subject to the approval of the nominated undertaker and with the agreement of the local authority, where appropriate).
- 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 on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate.
- Use enclosed chutes and 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 Earthworks

- Re-vegetate earthworks and exposed areas/soil stockpiles to stabilise surfaces as soon as practicable.
- Use Hessian, mulches or trackifiers where it is not possible to re-vegetate or cover with topsoil, as soon as practicable.
- Stockpile surface areas to be minimised (subject to health and safety and visual constraints regarding slope gradients and visual intrusion) to reduce area of surfaces exposed to wind pick-up.

- Where appropriate, windbreak netting/screening can be positioned around material stockpiles and vehicle loading/unloading areas, as well as exposed excavation and material handling operations, to provide a physical barrier between the Application Site and the surroundings.
- Where practicable, stockpiles of soils and materials should be located as far as possible from sensitive properties, taking account of the prevailing wind direction.
- During dry or windy weather, material stockpiles and exposed surfaces could be dampened down using a water spray to minimise the potential for wind pick-up.

Measures Specific to Construction

- Avoid scabbling (roughening of concrete surfaces) if possible.
- Ensure sand and other aggregates are stored in bunded areas and are not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate additional control measures are in place.
- Ensure bulk cement and other fine powder materials are delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery.
- For smaller supplies of fine power materials ensure bags are sealed after use and stored appropriately to prevent dust.
- All construction plant and equipment should be maintained in good working order and not left running when not in use.

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 log book.
- 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.

Residual Effects

6.1.2 The residual effects of dust and PM_{10} generated by construction activities following the application of the mitigation measures described above and good site practice is considered to be **negligible**.

6.1.3 The residual effects of emissions to air from construction vehicles and plant on local air quality is considered to be **negligible**.

6.2 Operation Phase

Mitigation

6.2.1 The proposed site access off Chippings Lane will provide improved footways along the site frontage along with improved bus stop facilities adjacent to the existing Public House. There will also be a pedestrian connection provided directly to the existing Sainsbury's store. New footway connections will also be provided to Thornfield Ave, Redwood Drive and Willows Park Lane, linking the Site to the town centre.

6.2.2 A Travel Plan will also be prepared for the Proposed Development. This offers the residents with a 'welcome pack', including details of the walking, cycling and public transport provision and a car sharing scheme to discourage use of the private car where possible.

Residual Effects

6.2.3 The residual effects of the Proposed Development on air quality following the implementation of the above mitigation measures are **slight adverse** to **negligible** for NO_2 and **negligible** to **neutral** for PM_{10} according to the EPUK assessment criteria.

7 Conclusions

7.1.1 A qualitative assessment of the potential impacts on local air quality from construction activities has been carried out for the Proposed Development using the IAQM methodology. This assessment identified that the Proposed Development is considered to be a High to Low Risk Site for dust deposition and Low Risk Site for PM_{10} concentrations. However, through good site practice and the implementation of suitable mitigation measures, the effect of dust and PM_{10} releases would be significantly reduced. The residual effects of dust and PM_{10} generated by construction activities on air quality are therefore considered to be **negligible**. The residual effects of emissions to air from construction vehicles and plant on local air quality is considered to be **negligible**.

7.1.2 In addition, a quantitative assessment of the potential impacts during the operational phase was undertaken using ADMS Roads to predict the changes in NO_2 and PM_{10} concentrations that would occur due to traffic generated by the Proposed Development.

7.1.3 The results show that overall the Proposed Development would cause small to imperceptible increases in annual mean NO_2 concentrations and imperceptible increases in annual mean PM_{10} concentrations but would not cause any exceedences of the relevant AQS objectives. A number of worst case assumptions were made in the calculations so that predicted concentrations can be considered to be conservative.

7.1.4 According to the assessment significance criteria, the residual effects of the Proposed Development are considered to range from **slight adverse** to **negligible** for NO_2 and **negligible** to **neutral** for PM_{10}. The slight adverse impacts predicted for concentrations of NO_2 are only predicted in two small areas towards the centre of Longridge. Overall, the impacts are considered to be negligible.

7.1.5 Furthermore, it is considered that the development proposals comply with national and local planning policy for air quality, and air quality is considered to be a low priority within the planning process.

8 References

Ref. 1 Department for Environment, Food and Rural Affairs (DEFRA) and the Devolved Administrations (2007). The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Volumes 1 and 2)

Ref. 2 The Air Quality (England) Regulations 2000 - Statutory Instrument 2000 No.928

Ref. 3 The Air Quality (England) (Amendment) Regulations 2002- Statutory Instrument 2002 No.3043

Ref. 4 The Air Quality Standards Regulations 2010 - Statutory Instrument 2010 No. 1001

Ref. 5 Directive 2008/50/EC of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe

Ref. 6 Directive 2004/107/EC of the European Parliament and of the Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air.

Ref. 7 The Environmental Protection Act 1990

Ref. 8 The Environment Act 1995

Ref. 9 Department for Communities and Local Government (2012). National Planning Policy Framework.

Ref. 10 Ribble Valley Borough Council Core Strategy 2008 – 2028 A Local Plan for Ribble Valley Regulation 22 Submission Draft (September 2012)

Ref. 11 DEFRA (2009) Part IV The Environment Act 1995 and Environment (Northern Ireland) Order 2002 Part III, Local Air Quality Management Review and Assessment Technical Guidance LAQM.TG(09)

Ref. 12 Environmental Protection UK (2010). Development Control: Planning for Air Quality (2010 Update)

Ref. 13 Institute of Air Quality Management (2014). Guidance on the Assessment of Dust from Demolition and Construction

Ref. 14 Department of Communities and Local Government (DCLG) (March 2014) National Planning Practice Guidance

Ref. 15 Ribble Valley Borough Council: 2013 Air Quality Progress Report for Ribble Valley Borough Council (April 2013)

Ref. 16 DEFRA Local Air Quality Management (LAQM) Support Pages. Available at: http://laqm.defra.gov.uk/

Ref. 17 Environment Agency Website. Available at http://www.environmentagency.gov.uk/homeandleisure/37793.aspx.

Ref. 18 Emission Factor Toolkit. Available at http://laqm.defra.gov.uk/review-and-assessment/tools/emissions.html#eft

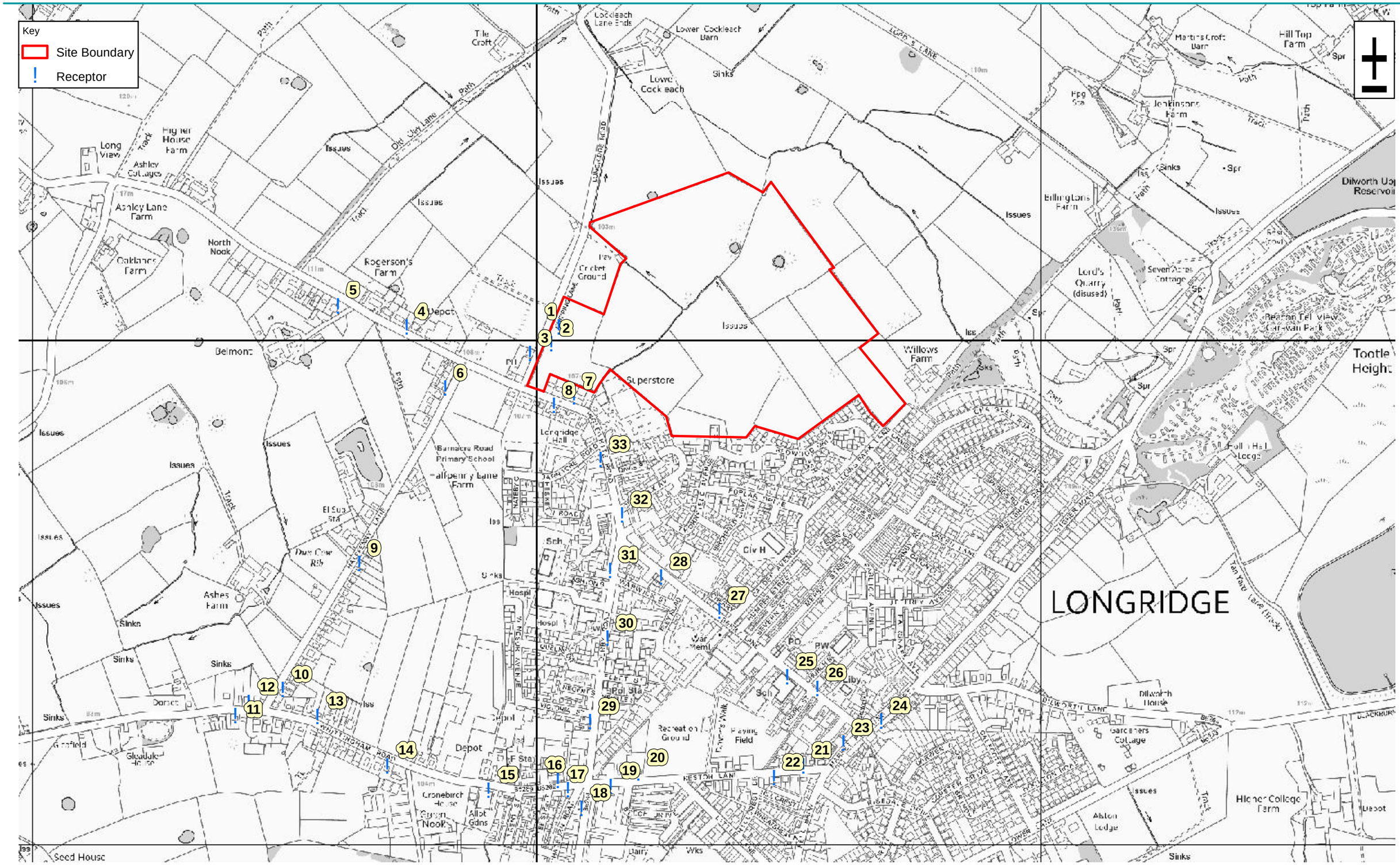
Figure & Appendices

Figure 1 - Location of Assessment Receptors

Location of Assessment Receptors

Scale @ A3 : 7,000

Figure 1



PROJECT: Chipping Lane, Longridge

PROJECT No: 70004536

Client: Barratt Homes

Drawn: JG
Checked: EE
Approved: JG
Revision: A
Date: June 2014

Appendix A – Glossary

Term	Definition
AADT Annual Average Daily Traffic	A daily total traffic flow (24 hrs), expressed as a mean daily flow across all 365 days of the year.
Adjustment	Application of a correction factor to modeled results to account for uncertainties in the model
Air quality objective	Policy target generally expressed as a maximum ambient concentration to be achieved, either without exception or with a permitted number of exceedences within a specific timescale (see also air quality standard).
Air quality standard	The concentrations of pollutants in the atmosphere which can broadly be taken to achieve a certain level of environmental quality. The standards are based on the assessment of the effects of each pollutant on human health including the effects on sensitive sub groups (see also air quality objective).
Ambient air	Outdoor air in the troposphere, excluding workplace air.
Annual mean	The average (mean) of the concentrations measured for each pollutant over a calendar year.
AQMA	Air Quality Management Area.
DEFRA	Department for Environment, Food and Rural Affairs.
DfT	Department for Transport.
Emission rate	The quantity of a pollutant released from a source over a given period of time.
Exceedence	A period of time where the concentrations of a pollutant is greater than the appropriate air quality standard.
HDV/HGV	Heavy Duty Vehicle/Heavy Goods Vehicle.
LAQM	Local Air Quality Management.
Model adjustment	Following model verification, the process by which modelled results are amended. This corrects for systematic error.
NO_2	Nitrogen dioxide.
NO_x	Nitrogen oxides.
PM_{10}	Particulate matter with an aerodynamic diameter of less than 10 micrometres.
$\mu g/m^3$ microgrammes per cubic metre	A measure of concentration in terms of mass per unit volume. A concentration of $1ug/m^3$ means that one cubic metre of air contains one microgram (millionth of a gram) of pollutant.

Appendix B – Relevant UK Air Quality Strategy Objectives

Air Quality Objectives currently included in the Air Quality Regulations 2000 and (Amendment) Regulations 2002 for the purpose of Local Air Quality Management (LAQM)						
Pollutant	**Applies to**	***Standard***		***Objective***		**EU Limit Values**
		Concentration	***Measured as***	***Annual exceedences allowed***	***Target date***	
Nitrogen dioxide (NO_2)	All UK	200µg/m^3	1 hour mean	18	31.12.2005	01.01.2010
	All UK	40µg/m^3	annual mean	-	31.12.2005	
Particulate Matter (PM_{10}) (gravimetric)[1]	All UK	40µg/m^3	annual mean	-	31.12.2004	01.01.2005
	All UK	50µg/m^3	24 hour mean	35	31.12.2004	01.01.2005

Explanation
µg/m^3 = microgram per cubic metre; [1] Measured using the European gravimetric transfer sampler or equivalent.

The Air Quality Strategy states that further review and assessment and consultation in relation to air quality will be a rolling process, with additional revisions to the objectives for selected pollutants as appropriate, or where there is new evidence in relation to the effects of pollutants on health or ecosystems. New pollutants may be introduced through future reviews.

Appendix C – Summary of IAQM Construction Phase Impact Assessment Procedure

Step 1 – Screening the need for a Detailed Assessment

An assessment will normally be required where there are:

- 'human receptors' within 350m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s); and/or
- 'ecological receptors' within 50m of the site boundary; or within 50m of the route(s) used by construction vehicles on the public highway, up to 500m from the site entrance(s).

Where the need for a more detailed assessment is screened out, it can be concluded that the level of risk is "negligible".

Step 2A – Define the Potential Dust Emission Magnitude

The following are examples of how the potential dust emission magnitude for different activities can be defined. (Note that not all the criteria need to be met for a particular class). Other criteria may be used if justified in the assessment.

1) Demolition

- Large: Total building volume >50 000 m^3 potentially dusty construction material (e.g. concrete), on-site crushing and screening, demolition activities >20 m above ground level;
- Medium: Total building volume 20 000 m^3 – 50 000m^3, potentially dusty construction material, demolition activities 10-20 m above ground level; and
- Small: Total building volume <20 000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber), demolition activities <10m above ground, demolition during wetter months.

2) Earthworks

- Large: 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;
- Medium: 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,
- Small: 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 <4 m in height, total material moved <10 000 tonnes, earthworks during wetter months.

3) Construction Activities

The key issues when determining the potential dust emission magnitude include the size of the building(s)/infrastructure, method if construction, construction materials and duration of build.

- Large: Total building volume >100 000 m^3, on site concrete batching, sandblasting
- Medium: Total building volume 25 000 m^3 – 100 000 m^3, potentially dusty construction material (e.g. concrete), on site concrete batching; and

- Small: Total building volume <25 000 m^3, construction material with low potential for dust release (e.g. metal cladding or timber).

4) Trackout

Factors which determine the magnitude class are vehicle size, vehicle speed, vehicle numbers, geology and duration. As with all other potential sources, professional judgement must be applied when classifying trackout into one of the magnitude categories.

- Large: >50 HDV (>3.5t) outward movements in any one day, potentially dusty surface material (e.g. high clay content), unpaved road length >100m;
- Medium: 10-50 HDV (>3.5t) outward movements in any one day, moderately dusty surface material (e.g. high clay content), unpaved road length 50m – 100m; and
- Small / Medium: <10 HDV (>3.5t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50m.

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

Step 2B – Define the Sensitivity of the Area

The tables below summarise the IAQM guidance on the sensitivity of different types of receptor to dust soiling, health and ecological effects.

Table 2Ba: Examples of Human Receptor Sensitivity to Construction Phase Impacts

Sensitivity	Dust Soiling Effects	Health Effects of PM_{10}
High	■ Users can reasonably expect an enjoyment of a high level amenity; or ■ The appearance, aesthetics or value of their property would be diminished by soiling; and the people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	■ Locations where members of the public are exposed over a period of time relevant to the air quality objective for PM_{10}. Examples include residential properties, hospitals, schools and residential care homes.
Medium	■ Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home; or ■ The appearance, aesthetics or value of their property could be diminished by soiling; or ■ The people or property wouldn't reasonably be expected to be present continuously, or regularly for extended periods, as part of the normal pattern of use of the land. Examples include places of work.	■ Locations where the people exposed are workers and exposure is over a period of time relevant to the air quality objective for PM_{10}. Examples include office and shop workers.
Low	■ The enjoyment of amenity would not reasonably be expected; or ■ Property would not reasonably be expected to be diminished in	■ Locations where human exposure is transient. Examples include footpaths, playing fields,

Sensitivity	Dust Soiling Effects	Health Effects of PM_{10}
	appearance, aesthetics or value by soiling; or ■ There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples include playing fields, farmland, footpaths, short-term car parks and roads.	parks and shopping streets.

Table 2Bb: Examples of Ecological Receptor Sensitivity to Construction Phase Impacts

Sensitivity	Description
High	■ Locations with an international or national designation and the designated features may be affected by dust soiling; or ■ Locations where there is a community of a particularly dust sensitive species. Examples include a Special Area of Conservation (SAC) designated for acid healthlands or a local site designated for lichens adjacent to the demolition of a large sire containing concrete (alkali) buildings.
Medium	■ Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown; or ■ Locations with a national designation where the features may be affected by dust deposition. Examples include a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	■ Locations with a local designation where the features may be affected by dust deposition. Examples include a Nature Reserve with dust sensitive features.

The tables below presents the IAQM assessment methodology determines the sensitivity of the area can be determined for dust soiling, human health and ecological impacts respectively.

Table 2Bc: Sensitivity of the Area to Dust Soiling Effects

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

Table 2Bd: Sensitivity of the Area to Human Health Impacts

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

Table 2Be: Sensitivity of the Area to Ecological Impacts

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

Step 2C – Define the Risk of Impacts

The dust emissions magnitude determined at Step 2A should be combined with the sensitivity of the area determined at Step 2B to determine the risk of impacts with no mitigation applied. For those cases where the risk category is 'negligible' no mitigation measures beyond those required by legislation will be required.

Table 2Ca: Risk of Dust Impacts – Demolition

Sensitivity of surrounding area	Dust Emission Magnitude		
	Large	Medium	Small
High	High Risk	Medium Risk	Medium Risk
Medium	High Risk	Medium Risk	Low Risk
Low	Medium Risk	Low Risk	Negligible

Table 2Cb: Risk of Dust Impacts – Earthworks

Sensitivity of surrounding 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 2Cc: Risk of Dust Impacts – Construction

Sensitivity of surrounding 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 2Cd: Risk of Dust Impacts – Trackout

Sensitivity of surrounding 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

Step 3 –Site Specific Mitigation

Having determined the risk categories for each of the four activities it is possible to determine the site-specific measures to be adopted. These measures will be related to whether the site is a low, medium or high risk site. The IAQM guidance details the mitigation measures required for high, medium and low risk sites as determined in Step 2C.

Step 4 – Determine Significant Effects

Once the risk of dust impacts has been determined in Step 2C and the appropriate dust mitigation measures identified in Step 3, the final step is to determine whether there are significant effects arising from the construction phase.

Step 5 – Prepare the dust assessment report

Appendix D – Traffic Data

Model Verification (2012)*

Road Link	Speed (kph)	Annual Average Daily Traffic Flow	%HDVs	NO_x Emission Factors (g/s/km)
A671 Whalley Road	32	17361	3.5	0.119
A671 Queensway	32	9695	2.4	0.053
B6243	32	7666	4.8	0.052

* Traffic data taken from Department for Transport website http://www.dft.gov.uk/traffic-counts

Baseline (2014)

Road Link	Speed (kph)	Annual Average Daily Traffic Flow	%HDVs	NO_x Emission Factors (g/s/km)	PM_{10} Emission Factors (g/s/km)
Chipping Lane (north of site access)	48	3121	4.0	0.0192	0.0016
Site Access	16	0	0.0	0.0000	0.0000
Chipping Lane (south of site access)	48	3121	4.0	0.0192	0.0016
Ingewhite Road (west of Halfpenny Lane)	48	4091	2.5	0.0222	0.0019
Ingewhite Road (west of Chipping Lane)	48	5119	1.8	0.0261	0.0024
Halfpenny Lane (northern part)	48	1407	0.0	0.0060	0.0006
Halfpenny Lane (southern part)	48	1665	0.9	0.0078	0.0007
Whittingham Road (west of Halfpenny Lane)	48	5846	2.4	0.0314	0.0028
Whittingham Road (east of Halfpenny Lane)	48	5110	3.0	0.0289	0.0025
Whittingham Road (west of Derby Road)	48	7616	4.4	0.0482	0.0039
Preston Road	40	13091	3.6	0.0856	0.0066
Kestor Lane	48	6105	5.3	0.0413	0.0032
Derby Road (north of Kestor Lane)	40	12316	3.2	0.0779	0.0061
Derby Road (south of Berry Lane)*	40	10715	2.6	0.0642	0.0052
Berry Lane (east of Derby Road) *	40	11003	2.3	0.0642	0.0053

Berry Lane (west of Calder Avenue)	40	10911	2.5	0.0648	0.0053
Calder Avenue	48	4125	2.6	0.0226	0.0020
Berry Lane (east of Calder Avenue)	40	9342	2.6	0.0560	0.0045
Berry Lane (west of King Street)	40	6672	2.9	0.0411	0.0033
King Street	40	8310	2.0	0.0471	0.0040
Market Place	40	6904	3.2	0.0437	0.0034
Inglewhite Road (north of Berry Lane) *	40	11240	1.5	0.0606	0.0053
Inglewhite Road (south of Sainsburys)	40	9932	1.6	0.0541	0.0047
Sainsburys Access Road	16	5451	0.5	0.0383	0.0027
Inglewhite Road (north of Sainsburys)	48	7459	2.4	0.0401	0.0035
Inglewhite Road (east of Chipping Lane)	48	7446	2.5	0.0404	0.0035

* These roads were modelled as street canyons with a height of 6m for all assessment scenarios.

Without Development (2025)

Road Link	Speed (kph)	Annual Average Daily Traffic Flow	%HDVs	NO_x Emission Factors (g/s/km)	PM_{10} Emission Factors (g/s/km)
Chipping Lane (north of site access)	48	4885	2.4	0.0263	0.0023
Site Access	16	0	0.0	0.0000	0.0000
Chipping Lane (south of site access)	48	4885	2.4	0.0263	0.0023
Ingewhite Road (west of Halfpenny Lane)	48	4813	2.1	0.0252	0.0023
Ingewhite Road (west of Chipping Lane)	48	7200	1.3	0.0350	0.0033
Halfpenny Lane (northern part)	48	1619	0.0	0.0069	0.0007
Halfpenny Lane (southern part)	48	1916	0.7	0.0088	0.0009
Whittingham Road (west of Halfpenny Lane)	48	9506	1.5	0.0471	0.0044
Whittingham Road (east of Halfpenny Lane)	48	8659	1.8	0.0441	0.0040
Whittingham Road (west of Derby Road)	48	13430	2.4	0.0722	0.0064

Preston Road	40	18366	2.6	0.1101	0.0089
Kestor Lane	48	8363	3.8	0.0505	0.0042
Derby Road (north of Kestor Lane)	40	14651	2.6	0.0878	0.0071
Derby Road (south of Berry Lane)	40	12824	2.1	0.0734	0.0061
Berry Lane (east of Derby Road)	40	13110	1.9	0.0736	0.0062
Berry Lane (west of Calder Avenue)	40	13004	2.1	0.0744	0.0062
Calder Avenue	48	4747	1.1	0.0226	0.0021
Berry Lane (east of Calder Avenue)	40	11198	2.2	0.0647	0.0054
Berry Lane (west of King Street)	40	8125	2.3	0.0474	0.0039
King Street	40	10575	1.6	0.0576	0.0050
Market Place	40	8868	2.5	0.0527	0.0043
Inglewhite Road (north of Berry Lane)	40	13948	1.3	0.0737	0.0065
Inglewhite Road (south of Sainsburys)	40	12442	1.3	0.0658	0.0058
Sainsburys Access Road	16	6274	0.2	0.0420	0.0031
Inglewhite Road (north of Sainsburys)	48	9596	1.8	0.0489	0.0045
Inglewhite Road (east of Chipping Lane)	48	9566	1.9	0.0492	0.0045

With Development (2025)

Road Link	Speed (kph)	Annual Average Daily Traffic Flow	%HDVs	NO_x Emission Factors (g/s/km)	PM_{10} Emission Factors (g/s/km)
Chipping Lane (north of site access)	48	5275	2.2	0.0279	0.0025
Site Access	16	2703	0.0	0.0175	0.0013
Chipping Lane (south of site access)	48	7198	1.6	0.0360	0.0033
Ingewhite Road (west of Halfpenny Lane)	48	4907	2.1	0.0257	0.0023
Ingewhite Road (west of Chipping Lane)	48	8021	1.1	0.0382	0.0036

Halfpenny Lane (northern part)	48	2347	0.0	0.0099	0.0010
Halfpenny Lane (southern part)	48	2644	0.5	0.0118	0.0012
Whittingham Road (west of Halfpenny Lane)	48	10234	1.4	0.0502	0.0047
Whittingham Road (east of Halfpenny Lane)	48	8659	1.8	0.0441	0.0040
Whittingham Road (west of Derby Road)	48	13430	2.4	0.0722	0.0064
Preston Road	40	19366	2.4	0.1140	0.0094
Kestor Lane	48	8363	3.8	0.0505	0.0042
Derby Road (north of Kestor Lane)	40	15651	2.4	0.0921	0.0076
Derby Road (south of Berry Lane)	40	13824	2.0	0.0784	0.0066
Berry Lane (east of Derby Road)	40	13602	1.9	0.0764	0.0065
Berry Lane (west of Calder Avenue)	40	13496	2.0	0.0765	0.0064
Calder Avenue	48	4747	1.1	0.0226	0.0021
Berry Lane (east of Calder Avenue)	40	11690	2.1	0.0669	0.0056
Berry Lane (west of King Street)	40	8617	2.1	0.0493	0.0041
King Street	40	11067	1.5	0.0597	0.0052
Market Place	40	8868	2.5	0.0527	0.0043
Inglewhite Road (north of Berry Lane)	40	15440	1.1	0.0799	0.0071
Inglewhite Road (south of Sainsburys)	40	13934	1.1	0.0721	0.0064
Sainsburys Access Road	16	6274	0.2	0.0420	0.0031
Inglewhite Road (north of Sainsburys)	48	11088	1.5	0.0549	0.0051
Inglewhite Road (east of Chipping Lane)	48	11058	1.6	0.0553	0.0051

Appendix E – Model Verification Calculations

The comparison of modelled concentrations with local monitored concentrations is a process termed 'verification'. Model verification investigates the discrepancies between modelled and measured concentrations, which can arise due to the presence of inaccuracies and/or uncertainties in model input data, modelling and monitoring data assumptions. The following are examples of potential causes of such discrepancy:

a) estimates of background pollutant concentrations;

b) meteorological data uncertainties;

c) traffic data uncertainties;

d) model input parameters, such as 'roughness length'; and

e) overall limitations of the dispersion model.

Verification Methodology

Detail of the verification process data is presented in Table E2. The adjustment factor (**3.16**) was derived which shows model results were over-estimating current conditions when comparing to the measured concentrations.

Table E2 – Verification Process Data

Site ID	Monitored Total NO_2	Background NO_2	Background NO_x	2012 Monitored Road Contribution NO2 (total - background)	2012 Monitored Road Contribution NOx (total - background)	2012 Modelled Road Contribution NOx (excludes background)
Royal British Legion	47.0	11.2	15.3	35.8	83.93	25.6
Whalley Road	43.4	11.2	15.3	32.2	73.57	24.3

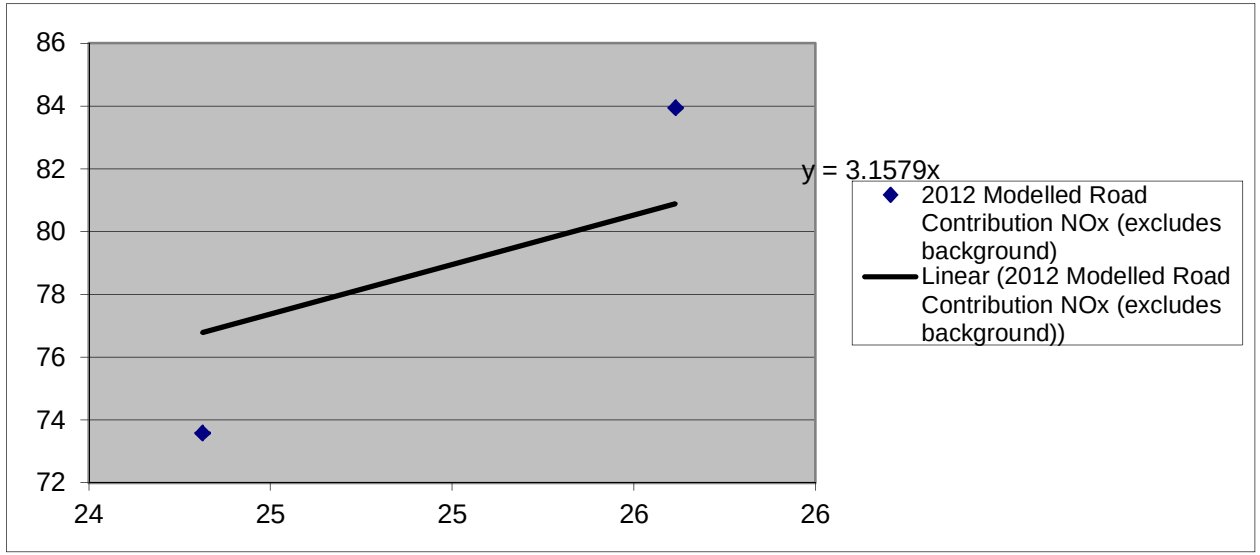


Table E5 – Application of Adjustment Factor

Site ID	Ratio of monitored NO_x road contribution /modelled road contribution NO_x	Adjustment factor for modelled road contribution	Adjusted modelled road contribution NO_x	Modelled Total NO_2	Monitored Total NO_2	% Difference
Royal British Legion	3.28	**3.16**	80.94	45.98	47.0	-2
Whalley Road	3.03		76.83	44.55	43.4	3

Appendix F – Summary of EPUK Significance Criteria

The following criteria relate to changes in annual mean NO_2/PM_{10} concentrations and 24-hour mean PM_{10} concentrations resulting from the development.

ANNUAL MEAN NO_2 AND PM_{10} CONCENTRATIONS

Significance Criteria	Definition
Neutral	The development causes no change in concentrations.
Negligible Impact	The development gives rise to a IMPERCEPTIBLE change in concentrations or; The development gives rise to a SMALL change in concentrations and predicted concentrations are below 36μg/m^3; or The development gives rise to a MEDIUM change in concentrations and predicted concentrations are below 30μg/m^3.
A Slight Adverse Impact	The development gives rise to a SMALL increase in concentrations and predicted concentrations with the development in place are above 36μg/m^3; or The development gives rise to a MEDIUM increase in concentrations and predicted concentrations with the development in place are between 30-36μg/m^3; or The development gives rise to a LARGE increase in concentrations and predicted concentrations with the development in place are less than 36μg/m^3.
A Moderate Adverse Impact	The development gives rise to a MEDIUM increase in concentrations and predicted concentrations with the development in place are above 36μg/m^3; or The development gives rise to a LARGE increase in concentrations and predicted concentrations with the development in place are between 36-40μg/m^3.
A Substantial Adverse Impact	The development gives rise to a LARGE increase in concentrations and predicted concentrations with the development in place exceed the objective level of 40μg/m^3.
A Slight Beneficial Impact	The development gives rise to a SMALL decrease in concentrations and predicted concentrations without the development in place are above 36μg/m^3; or The development gives rise to a MEDIUM decrease in concentrations and predicted concentrations without the development in place are between 30-36μg/m^3; or The development gives rise to a LARGE decrease in concentrations and predicted concentrations without the development in place are less than 36μg/m^3.
A Moderate Beneficial Impact	The development gives rise to a MEDIUM decrease in concentrations and predicted concentrations without the development in place are above 36μg/m^3; or The development gives rise to a LARGE decrease in concentrations and predicted concentrations without the development in place are between 36-40μg/m^3.
A Substantial Beneficial Impact	The development gives rise to a LARGE decrease in concentrations and predicted concentrations without the development in place exceed the objective level of 40μg/m^3.

Where the magnitude of change in concentration for annual mean NO_2 and PM_{10} has been defined as follows:

An IMPERCEPTIBLE change is a change of <0.4μg/m^3;

A SMALL change is a change of less than 0.4 – 2μg/m^3;

A MEDIUM change is a change of 2 - 4μg/m^3; and

A LARGE change is a change of > 4μg/m^3.

DAILY MEAN PM_{10} CONCENTRATIONS

Significance Criteria	Definition
Neutral	The development causes no change in the number of days of exceedence.
Negligible Impact	The development gives rise to a IMPERCEPTIBLE change in the number of days of exceedence; or The development gives rise to a SMALL change and the predicted number of days of exceedence is below 32 days; or The development gives rise to a MEDIUM change and the predicted number of days of exceedence is below 26 days.
A Slight Adverse Impact	The development gives rise to a SMALL increase and the predicted number of days of exceedence is above 32 days; or The development gives rise to a MEDIUM increase and the predicted number of days of exceedence is between 26 and 32 days; or The development gives rise to a LARGE increase and the predicted number of days of exceedence is below 32 days.
A Moderate Adverse Impact	The development gives rise to a MEDIUM increase and the predicted number of days of exceedence is above 32 days; or The development gives rise to a LARGE increase and the predicted number of days of exceedence is between 32 and 35 days.
A Substantial Adverse Impact	The development gives rise to a LARGE increase and the number of days of exceedence with the development in place is above 35 days.
A Slight Beneficial Impact	The development gives rise to a SMALL decrease and the predicted number of days of exceedence without the development is above 32 days; or The development gives rise to a MEDIUM decrease and the predicted number of days of exceedence without the development is between 26 and 32 days; or The development gives rise to a LARGE decrease and the predicted number of days of exceedence without the development is between 32 and 35 days.
A Moderate Beneficial Impact	The development gives rise to a MEDIUM decrease and the predicted number of days of exceedence without the development is above 32 days; or The development gives rise to a LARGE decrease and the predicted number of days of exceedence without the development is between 32 and 35 days.
A Substantial Beneficial Impact	The development gives rise to a LARGE decrease and the number of days of exceedence without the development in place is above 35 days.

Where the magnitude of change is defined as the number of days of exceedence of a daily mean PM_{10} concentration of 50µg/m^3:

An IMPERCEPTIBLE change is a change of < 1 day;

A SMALL change is a change of 1- 2 days;

A MEDIUM change is a change of 2 - 4 days; and

A LARGE change is a change of > 4 days.

Appendix G – Assessment Results (Manchester Met Data)

Annual Mean NO_2 Concentrations ($\mu g/m^3$)

Receptor Number	Receptor Name	2014 Baseline	2025 Without Development	2025 Without Development	Increase due to development
1	Proposed Development Site	16.6	17.98	20.76	2.78
2	Proposed Development Site	17.16	18.68	20.86	2.18
3	Alston Arms (P.H)	19.5	21.74	24.06	2.32
4	Residential property adjacent to Inglewhite Road	19.19	20.28	20.59	0.31
5	Residential property adjacent to Inglewhite Road	15.5	16.1	16.26	0.16
6	Residential property adjacent to Halfpenny Lane	15.61	16.37	17.34	0.97
7	Residential property adjacent to Inglewhite Road	22.39	24.54	25.87	1.33
8	Residential property adjacent to Inglewhite Road	20.38	22.16	23.24	1.08
9	Residential property adjacent to Halfpenny Lane	14.24	14.79	15.35	0.56
10	Residential property adjacent to Halfpenny Lane	16.61	18.41	18.97	0.56
11	Residential property adjacent to Whittingham Road	17.59	20.17	20.65	0.48
12	Residential property adjacent to Whittingham Road	20.56	24.39	25.13	0.74
13	Residential property adjacent to Whittingham Road	20.47	24.43	24.54	0.11
14	Residential property adjacent to Whittingham Road	16.92	19.21	19.27	0.06
15	Allotments in Whittingham Road	18.73	21.6	21.69	0.09
16	Residential property adjacent to Whittingham Road	29.41	35.48	35.7	0.22
17	Residential property adjacent to Whittingham Road	28.69	33.97	34.29	0.32
18	Shop adjacent to Preston Road	38.14	44.13	44.95	0.82
19	Shop adjacent to Kestor Lane	26.56	29.81	30.1	0.29
20	Residential property adjacent to Kestor Lane	25.35	28.16	28.32	0.16

21	Residential property adjacent to Kestor Lane	28.74	31.96	32.02	0.06
22	Residential property adjacent to Kestor Lane	20.91	22.78	22.85	0.07
23	Residential property adjacent to Market Place	26.86	29.55	29.66	0.11
24	Residential property adjacent to King Street	23.01	25.19	25.58	0.39
25	School adjacent to Berry Lane	21.7	23.25	23.62	0.37
26	Residential property adjacent to Berry Lane	27.55	29.81	30.39	0.58
27	Shopping Parade adjacent to Berry Lane	33.44	36.08	36.68	0.6
28	Shopping Parade adjacent to Berry Lane	28.27	30.49	31.17	0.68
29	Residential property adjacent to Derby Street	34.09	36.96	37.87	0.91
30	Residential property adjacent to Derby Street	32.53	35.21	36.42	1.21
31	Residential property adjacent to Derby Street	32.61	35.27	36.51	1.24
32	Residential property adjacent to Inglewhite Road	33.75	37.37	38.92	1.55
33	Residential property adjacent to Inglewhite Road	24.68	27.14	28.33	1.19

Annual Mean PM_{10} Concentrations ($\mu g/m^3$)

Receptor Number	Receptor Name	2014 Baseline	2025 Without Development	2025 Without Development	Increase due to development
1	Proposed Development Site	15.06	15.34	15.81	0.47
2	Proposed Development Site	15.16	15.47	15.88	0.40
3	Alston Arms (P.H)	15.57	16.04	16.53	0.49
4	Residential property adjacent to Inglewhite Road	15.52	15.81	15.84	0.04
5	Residential property adjacent to Inglewhite Road	14.89	15.03	15.05	0.02
6	Residential property adjacent to Halfpenny Lane	14.95	15.11	15.30	0.19
7	Residential property adjacent to Inglewhite Road	16.11	16.61	16.90	0.29
8	Residential property adjacent to Inglewhite Road	15.74	16.15	16.37	0.23
9	Residential property adjacent to Halfpenny Lane	14.69	14.82	14.93	0.11
10	Residential property adjacent to Halfpenny Lane	15.09	15.48	15.60	0.11
11	Residential property adjacent to Whittingham Road	15.28	15.81	15.91	0.10
12	Residential property adjacent to Whittingham Road	15.81	16.65	16.80	0.16
13	Residential property adjacent to Whittingham Road	15.76	16.59	16.62	0.03
14	Residential property adjacent to Whittingham Road	15.13	15.59	15.60	0.02
15	Allotments in Whittingham Road	15.42	16.01	16.03	0.02
16	Residential property adjacent to Whittingham Road	17.22	18.72	18.79	0.07
17	Residential property adjacent to Whittingham Road	17.06	18.33	18.43	0.10
18	Shop adjacent to Preston Road	18.78	20.34	20.64	0.30
19	Shop adjacent to Kestor Lane	16.64	17.40	17.48	0.08
20	Residential property adjacent to Kestor Lane	16.43	17.09	17.13	0.04
21	Residential property adjacent to Kestor Lane	17.02	17.82	17.84	0.02
22	Residential property adjacent to Kestor Lane	15.69	16.11	16.13	0.02

23	Residential property adjacent to Market Place	16.71	17.32	17.35	0.03
24	Residential property adjacent to King Street	16.15	16.60	16.69	0.08
25	School adjacent to Berry Lane	15.87	16.19	16.27	0.08
26	Residential property adjacent to Berry Lane	16.89	17.39	17.53	0.14
27	Shopping Parade adjacent to Berry Lane	18.07	18.71	18.86	0.15
28	Shopping Parade adjacent to Berry Lane	17.08	17.58	17.75	0.17
29	Residential property adjacent to Derby Street	18.04	18.76	19.04	0.28
30	Residential property adjacent to Derby Street	17.84	18.49	18.80	0.31
31	Residential property adjacent to Derby Street	17.87	18.51	18.83	0.32
32	Residential property adjacent to Inglewhite Road	18.31	19.16	19.56	0.40
33	Residential property adjacent to Inglewhite Road	16.52	17.04	17.30	0.26

PM_{10} – Number of days of exceedence

Receptor Number	Receptor Name	2014 Baseline	2025 Without Development	2025 Without Development	Change due to development
1	Proposed Development Site	0.1	0.2	0.3	No Change
2	Proposed Development Site	0.1	0.2	0.3	No Change
3	Alston Arms (P.H)	0.2	0.3	0.5	No Change
4	Residential property adjacent to Inglewhite Road	0.2	0.3	0.3	No Change
5	Residential property adjacent to Inglewhite Road	0.1	0.1	0.1	No Change
6	Residential property adjacent to Halfpenny Lane	0.1	0.1	0.2	No Change
7	Residential property adjacent to Inglewhite Road	0.3	0.5	0.7	No Change
8	Residential property adjacent to Inglewhite Road	0.2	0.4	0.4	No Change
9	Residential property adjacent to Halfpenny Lane	0.1	0.1	0.1	No Change
10	Residential property adjacent to Halfpenny Lane	0.1	0.2	0.2	No Change
11	Residential property adjacent to Whittingham Road	0.2	0.3	0.3	No Change
12	Residential property adjacent to Whittingham Road	0.3	0.6	0.6	No Change
13	Residential property adjacent to Whittingham Road	0.2	0.5	0.6	No Change
14	Residential property adjacent to Whittingham Road	0.1	0.2	0.2	No Change
15	Allotments in Whittingham Road	0.2	0.3	0.3	No Change
16	Residential property adjacent to Whittingham Road	0.9	2.0	2.1	No Change
17	Residential property adjacent to Whittingham Road	0.8	1.7	1.8	No Change
18	Shop adjacent to Preston Road	2.1	3.8	4.2	1 day
19	Shop adjacent to Kestor Lane	0.6	1.0	1.0	No Change
20	Residential property adjacent to Kestor Lane	0.5	0.8	0.8	No Change
21	Residential property adjacent to Kestor Lane	0.8	1.3	1.3	No Change
22	Residential property adjacent to Kestor Lane	0.2	0.3	0.4	No Change

23	Residential property adjacent to Market Place	0.6	0.9	0.9	No Change
24	Residential property adjacent to King Street	0.4	0.5	0.6	No Change
25	School adjacent to Berry Lane	0.3	0.4	0.4	No Change
26	Residential property adjacent to Berry Lane	0.7	1.0	1.1	No Change
27	Shopping Parade adjacent to Berry Lane	1.5	2.0	2.1	No Change
28	Shopping Parade adjacent to Berry Lane	0.8	1.1	1.2	No Change
29	Residential property adjacent to Derby Street	1.4	2.1	2.3	No Change
30	Residential property adjacent to Derby Street	1.3	1.8	2.1	1 day
31	Residential property adjacent to Derby Street	1.3	1.8	2.1	1 day
32	Residential property adjacent to Inglewhite Road	1.7	2.5	2.9	No Change
33	Residential property adjacent to Inglewhite Road	0.5	0.8	0.9	No Change

Appendix H – Assessment Results (Blackpool Met Data)

Annual Mean NO_2 Concentrations ($\mu g/m^3$)

Receptor Number	Receptor Name	2014 Baseline	2025 Without Development	2025 Without Development	Increase due to development
1	Proposed Development Site	15.6	16.44	18.26	1.82
2	Proposed Development Site	16.04	16.95	19.72	2.77
3	Alston Arms (P.H)	18.24	19.62	22.1	2.48
4	Residential property adjacent to Inglewhite Road	17.85	18.62	19.03	0.41
5	Residential property adjacent to Inglewhite Road	16.7	17.31	17.6	0.29
6	Residential property adjacent to Halfpenny Lane	15.77	16.37	17.27	0.9
7	Residential property adjacent to Inglewhite Road	19.41	20.76	21.95	1.19
8	Residential property adjacent to Inglewhite Road	22.5	24.32	25.91	1.59
9	Residential property adjacent to Halfpenny Lane	14.32	14.73	15.25	0.52
10	Residential property adjacent to Halfpenny Lane	16.25	17.41	17.96	0.55
11	Residential property adjacent to Whittingham Road	19.78	22.45	23.01	0.56
12	Residential property adjacent to Whittingham Road	19.84	22.48	23.07	0.59
13	Residential property adjacent to Whittingham Road	19.36	21.98	22.12	0.14
14	Residential property adjacent to Whittingham Road	19.18	21.66	21.75	0.09
15	Allotments in Whittingham Road	21.38	24.44	24.55	0.11
16	Residential property adjacent to Whittingham Road	28.77	33.63	33.86	0.23
17	Residential property adjacent to Whittingham Road	32.37	37.9	38.2	0.3
18	Shop adjacent to Preston Road	39.11	43.96	44.76	0.8
19	Shop adjacent to Kestor Lane	29.06	32.17	32.42	0.25
20	Residential property adjacent to Kestor	24.29	26.54	26.7	0.16

	Lane				
21	Residential property adjacent to Kestor Lane	27.78	30.28	30.39	0.11
22	Residential property adjacent to Kestor Lane	23.76	25.77	25.87	0.1
23	Residential property adjacent to Market Place	26.09	27.59	27.84	0.25
24	Residential property adjacent to King Street	24.31	25.63	26.49	0.86
25	School adjacent to Berry Lane	24.3	25.44	26.42	0.98
26	Residential property adjacent to Berry Lane	24.76	25.95	26.99	1.04
27	Shopping Parade adjacent to Berry Lane	30.4	32.03	32.97	0.94
28	Shopping Parade adjacent to Berry Lane	32.8	34.91	35.98	1.07
29	Residential property adjacent to Derby Street	34.15	36.93	37.77	0.84
30	Residential property adjacent to Derby Street	30.58	33.24	33.95	0.71
31	Residential property adjacent to Derby Street	32.99	35.88	36.73	0.85
32	Residential property adjacent to Inglewhite Road	29.4	32.29	33.82	1.53
33	Residential property adjacent to Inglewhite Road	25.42	27.76	29.21	1.45

Annual Mean PM_{10} Concentrations ($\mu g/m^3$)

Receptor Number	Receptor Name	2014 Baseline	2025 Without Development	2025 Without Development	Increase due to development
1	Proposed Development Site	13.78	13.99	14.32	0.32
2	Proposed Development Site	13.86	14.09	14.63	0.53
3	Alston Arms (P.H)	14.26	14.62	15.18	0.57
4	Residential property adjacent to Inglewhite Road	14.25	14.43	14.52	0.09
5	Residential property adjacent to Inglewhite Road	14.03	14.17	14.23	0.06
6	Residential property adjacent to Halfpenny Lane	13.88	14.03	14.24	0.21
7	Residential property adjacent to Inglewhite Road	14.53	14.87	15.15	0.27
8	Residential property adjacent to Inglewhite Road	15.14	15.62	16.01	0.38
9	Residential property adjacent to Halfpenny Lane	13.60	13.69	13.82	0.12
10	Residential property adjacent to Halfpenny Lane	13.96	14.23	14.36	0.14
11	Residential property adjacent to Whittingham Road	14.60	15.25	15.39	0.14
12	Residential property adjacent to Whittingham Road	14.62	15.26	15.41	0.15
13	Residential property adjacent to Whittingham Road	14.48	15.12	15.16	0.03
14	Residential property adjacent to Whittingham Road	14.44	15.04	15.06	0.02
15	Allotments in Whittingham Road	14.82	15.58	15.61	0.02
16	Residential property adjacent to Whittingham Road	16.11	17.45	17.51	0.06
17	Residential property adjacent to Whittingham Road	16.80	18.40	18.48	0.08
18	Shop adjacent to Preston Road	18.14	19.56	19.76	0.21
19	Shop adjacent to Kestor Lane	16.09	16.96	17.02	0.06
20	Residential property adjacent to Kestor Lane	15.21	15.81	15.85	0.04
21	Residential property adjacent to Kestor Lane	15.85	16.54	16.57	0.03
22	Residential property adjacent to Kestor Lane	15.11	15.65	15.67	0.02

23	Residential property adjacent to Market Place	15.62	15.94	16.00	0.06
24	Residential property adjacent to King Street	15.38	15.68	15.89	0.20
25	School adjacent to Berry Lane	15.29	15.58	15.81	0.23
26	Residential property adjacent to Berry Lane	15.38	15.67	15.92	0.24
27	Shopping Parade adjacent to Berry Lane	16.59	17.05	17.25	0.20
28	Shopping Parade adjacent to Berry Lane	17.12	17.66	17.95	0.29
29	Residential property adjacent to Derby Street	17.18	17.94	18.19	0.25
30	Residential property adjacent to Derby Street	16.58	17.22	17.48	0.26
31	Residential property adjacent to Derby Street	17.10	17.82	18.12	0.31
32	Residential property adjacent to Inglewhite Road	16.52	17.25	17.67	0.42
33	Residential property adjacent to Inglewhite Road	15.69	16.27	16.64	0.36

PM_{10} – Number of days of exceedence

Receptor Number	Receptor Name	2014 Baseline	2025 Without Development	2025 Without Development	Change due to development
1	Proposed Development Site	0.2	0.1	0.2	No Change
2	Proposed Development Site	0.2	0.2	0.2	No Change
3	Alston Arms (P.H)	0.2	0.3	0.4	No Change
4	Residential property adjacent to Inglewhite Road	0.2	0.2	0.2	No Change
5	Residential property adjacent to Inglewhite Road	0.2	0.2	0.2	No Change
6	Residential property adjacent to Halfpenny Lane	0.2	0.1	0.2	No Change
7	Residential property adjacent to Inglewhite Road	0.1	0.3	0.4	No Change
8	Residential property adjacent to Inglewhite Road	0.1	0.6	0.8	No Change
9	Residential property adjacent to Halfpenny Lane	0.3	0.1	0.1	No Change
10	Residential property adjacent to Halfpenny Lane	0.2	0.2	0.2	No Change
11	Residential property adjacent to Whittingham Road	0.1	0.5	0.6	No Change
12	Residential property adjacent to Whittingham Road	0.1	0.5	0.6	No Change
13	Residential property adjacent to Whittingham Road	0.1	0.4	0.4	No Change
14	Residential property adjacent to Whittingham Road	0.1	0.4	0.4	No Change
15	Allotments in Whittingham Road	0.1	0.6	0.6	No Change
16	Residential property adjacent to Whittingham Road	0.3	1.9	2.0	1 day
17	Residential property adjacent to Whittingham Road	0.6	2.9	3.0	1 day
18	Shop adjacent to Preston Road	1.5	4.5	5.0	1 day
19	Shop adjacent to Kestor Lane	0.3	1.5	1.5	No Change
20	Residential property adjacent to Kestor Lane	0.1	0.7	0.7	No Change
21	Residential property adjacent to Kestor Lane	0.3	1.2	1.2	No Change
22	Residential property adjacent to Kestor Lane	0.1	0.6	0.6	No Change

23	Residential property adjacent to Market Place	0.2	0.9	0.9	No Change
24	Residential property adjacent to King Street	0.2	0.8	0.8	No Change
25	School adjacent to Berry Lane	0.2	0.6	0.7	No Change
26	Residential property adjacent to Berry Lane	0.2	0.7	0.8	No Change
27	Shopping Parade adjacent to Berry Lane	0.5	1.5	1.7	No Change
28	Shopping Parade adjacent to Berry Lane	0.8	2.1	2.3	No Change
29	Residential property adjacent to Derby Street	0.8	2.2	2.5	No Change
30	Residential property adjacent to Derby Street	0.5	1.6	1.8	No Change
31	Residential property adjacent to Derby Street	0.8	2.1	2.4	No Change
32	Residential property adjacent to Inglewhite Road	0.5	1.7	2.0	1 day
33	Residential property adjacent to Inglewhite Road	0.2	1.0	1.2	No Change

Summary

Although there is little significant difference in the total predicted concentrations using the Blackpool meteorological data to those predicted using the Manchester meteorological data, the overall pattern in terms of magnitude of change in concentrations and significance (as defined in the EPUK guidance) is unchanged.

The results show that overall the Proposed Development would cause small to imperceptible increases in annual mean NO_2 concentrations and imperceptible increases in annual mean PM_{10} concentrations but would not cause any exceedences of the relevant AQS objectives.

According to the assessment significance criteria, the residual effects of the Proposed Development are considered to range from slight adverse to negligible for NO_2 and negligible to neutral for PM_{10}. The slight adverse impacts predicted for concentrations of NO_2 are again only predicted in two small areas towards the centre of Longridge. Overall, the impacts are considered to be negligible.

Tel: +44 (0)117 930 2000
Fax: +44 (0)117 929 4624
www.wspgroup.co.uk