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Aldi, Birdwell: Air Quality Assessment

**Prepared for
Aldi UK Ltd**

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Experts in Air Quality Assessment & Monitoring



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1 INTRODUCTION

1.1 Scope

GEM Air Quality Ltd has been commissioned by Aldi UK Ltd to undertake a detailed air quality assessment based on the potential impacts of a proposed Aldi store located along the A61 Sheffield Road in Birdwell, South Yorkshire.

The detailed air quality assessment will focus on the potential impacts on local traffic emissions once the development has been completed. This will be undertaken by assessing the potential impact of increased traffic emissions due to the development at existing receptors located adjacent to the modelled road network. The roads modelled as part of this assessment include the A61 Sheffield Road and the M1/A61 in the vicinity of Junction 36.

The pollutants modelled as part of this assessment are nitrogen dioxide (NO₂) and particulate matter (PM₁₀). The impacts of vehicle emissions were assessed using the techniques detailed within Volume 11, Section 3 of the Design Manual for Roads and Bridges (DMRB)¹ and the Local Air Quality Management Technical Guidance (LAQM.TG09)². The impact of road traffic emissions were assessed using the latest version of the ADMS-Roads air dispersion model. This model has been devised by Cambridge Environmental Research Consultants (CERC) and is described as a comprehensive tool for investigating air pollution problems due to small networks of roads.

It should be noted that the short term impacts of NO₂ and PM₁₀ emissions have not been modelled as dispersion models are inevitably poor at predicting short-term peaks in pollutant concentrations, which are highly variable from year to year, and from site to site. Notwithstanding this, general assumptions have been made about short term concentrations based on the modelled annual mean concentrations.

In addition to this, the assessment also discusses ways of minimising the impacts of potential poor air quality on existing and proposed receptors by way of mitigation measures, as well as assessing the potential impact on local air quality from demolition and construction activities at the site.

¹ Design Manual for Roads and Bridges, Volume 11, Section 3, Part 1 – HA207/07, Highways Agency, May 2007

² Part IV of the Environment Act 1995, Local Air Quality Management Technical Guidance (TG09), Defra, February 2009

2 POLLUTANTS & LEGISLATION

2.1 Pollutant Overview

In most urban areas of the UK, traffic generated pollutants have become the most common pollutants. These are nitrogen dioxide (NO₂), fine particulates (PM₁₀), carbon monoxide (CO), 1,3-butadiene and benzene, as well as carbon dioxide (CO₂). This air quality assessment focuses on NO₂ and PM₁₀, as these pollutants are least likely to meet their Air Quality Strategy objectives near roads. Table 1 provides an overview of NO₂ and PM₁₀.

Table 1 – Overview of NO₂ and PM₁₀

Pollutant	Properties	Anthropogenic Sources	Natural Sources	Potential Effects
Particles (PM₁₀)	Tiny particulates of solid or liquid nature suspended in the air	Road transport; Power generation plants; Production processes e.g. windblown dust	Soil erosion; Volcanoes; Forest fires; Sea salt crystals	Asthma; Lung cancer; Cardiovascular problems
Nitrogen Dioxide (NO₂)	Reddish-brown coloured gas with a distinct odour	Road transport; Power generation plants; Fossil fuels – extraction & distribution; Petroleum refining	No natural sources, although nitric oxide (NO) can form in soils	Pulmonary edema; Various environmental impacts e.g. acid rain

2.2 Air Quality Strategy

The UK Government and the devolved administrations published the latest Air Quality Strategy for England, Scotland, Wales and Northern Ireland on 17 July 2007³. The Strategy provides an over-arching strategic framework for air quality management in the UK by way of the following:

- setting out a way forward for work and planning on air quality issues;
- setting out the air quality standards and objectives to be achieved;
- introducing a new policy framework for tackling fine particles; and
- identifying potential new national policy measures which modelling indicates could give further health benefits and move closer towards meeting the Strategy's objectives.

With regards to this assessment, the Air Quality Strategy contains national air quality standards and objectives established by the Government to protect human health. The objectives for nitrogen dioxide and particulates (PM₁₀ and PM_{2.5}) have been set, along with

³ The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, Department for Environment, Food and Rural Affairs in partnership with the Scottish Executive, Welsh Assembly Government and Department of the Environment Northern Ireland, July 2007

seven other pollutants (benzene, 1,3-butadiene, carbon monoxide, lead, PAHs, sulphur dioxide and ozone). Table 2 provides the Air Quality Objectives for NO₂ and PM₁₀.

Table 2 – UK Air Quality Objectives for Nitrogen Dioxide and Particulate Matter

Pollutant	Objective	Concentration measured as	Date to be achieved by and maintained thereafter
Particles (PM₁₀)	<i>All authorities:</i> 50µg/m ³ not to be exceeded more than 35 times a year	24 hour mean	31 December 2004
	<i>Authorities in Scotland only:</i> 50µg/m ³ not to be exceeded more than 7 times a year	24 hour mean	31 December 2010
	<i>All authorities:</i> 40µg/m ³	Annual mean	31 December 2004
	<i>Authorities in Scotland only:</i> 18µg/m ³	Annual mean	31 December 2010
Nitrogen Dioxide (NO₂)	200µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31 December 2005
	40µg/m ³	Annual mean	31 December 2005

The UK Government and the Devolved Administrations have set new national air quality objectives for particulate matter smaller than 2.5 µm diameter (PM_{2.5}). These objectives have not been incorporated into LAQM Regulations (see Section 2.3). As such, this assessment has not considered the impact of PM_{2.5}.

2.3 Local Air Quality Management

Part IV of the Environment Act 1995 requires local authorities to review and assess existing air quality within their boundaries, as well as predict future air quality as part of an ongoing Review and Assessment process. The current timetable for Review and Assessment (rounds 4, 5 and 6) requires every local authority to report to the Scottish Government, in conjunction with Defra, up to and including 2017, with the different elements repeated over a three year cycle.



2.3.1 Barnsley Metropolitan Borough Council

The Council completed its most recent Air Quality Updating and Screening Assessment (USA) Report in May 2012. Previous work in Barnsley had led to the declaration of six Air Quality Management Areas (AQMAs), due to the exceedence of the annual mean objective for nitrogen dioxide. At the time of writing of the USA, a further two AQMAs were in the process of being declared. The Council is also seeking to revoke an existing AQMA in Barnsley.

In relation to the proposed development, the M1 at Junction 36 and at the junction between the A61 Sheffield Road and A6133 Cemetery Road in Barnsley have been declared AQMAs.

3 PLANNING POLICY & GUIDANCE

3.1 National Planning Policy & Guidance

3.1.1 National Planning Policy Framework

On a national level, air quality can be a material consideration in planning decisions. The National Planning Policy Framework (NPPF) for England, released on 27th March 2012, is considered a key part of the Governments reforms to make the planning system less complex and more accessible, to protect the environment and to promote sustainable growth. The NPPF replaces the Planning Policy Statement 23 (PPS23) *Planning and Pollution Control*⁴.

The NPPF states that 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 or land instability”.

It goes on to state that “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”.

3.1.2 Environmental Protection UK

In 2006, the National Society for Clean Air and Environmental Protection (NSCA) issued a guidance document with regards to assisting both developers and planning authorities on air quality issues⁵. In April 2010, this guidance was updated by Environmental Protection UK (formerly known as the National Society for Clean Air and Environmental Protection)⁶.

The updated guidance provides a set of criteria used to determine whether a development will have a significant impact on air quality. If the Proposed development results in a significant change in air quality or results in a change of relevant exposure to air quality then it is reasonable to expect an air quality assessment to be undertaken. The report describes how, in all cases, professional judgement is required when deciding if an air quality assessment is necessary, as it is not possible to apply an exact and precise set of criteria to

⁴ Planning Policy Statement 23: Planning and Pollution Control, Office of the Deputy Prime Minister (ODPM), November 2004

⁵ Development Control: Planning for Air Quality, An Updated guidance from NSCA on dealing with air quality concerns within the development control process, NSCA, 2006

⁶ Development Control: Planning For Air Quality (2010 Update), Updated guidance from Environmental Protection UK on dealing with air quality concerns within the development control process, Environmental Protection UK, April 2010

all development proposal situations. However, the following criterion has been defined, allowing each development to be screened:

“Proposals that will give rise to a significant change in either traffic volumes, typically a change in annual average daily traffic (AADT) or peak traffic flows of greater than $\pm 5\%$ or $\pm 10\%$, depending on local circumstances (a change of $\pm 5\%$ will be appropriate for traffic flows within an AQMA), or in vehicle speed (typically of more than ± 10 kph), or both, usually on a road with more than 10,000 AADT”.

3.1.3 The Air Quality Expert Group

The Air Quality Expert Group (AQEG) is an advisory group that provides independent scientific advice on air quality. AQEG published *Air Quality and Climate Change: A UK Perspective*⁷ in 2007. The report recognises the potential for both local and global air quality improvements. Local authorities will be looking towards reductions in both and developers should take this into account throughout the design, construction and operational phases of a development, bearing in mind any potential trade-offs between global and local air quality improvements.

3.2 Local Planning Policy

3.2.1 Barnsley Metropolitan Borough Council

The Council has recently consulted on its draft Local Development Framework (LDF) Core Strategy (Barnsley Local Development Framework Core Strategy, published February 2010). Embedded within the Core Strategy are Core Strategy Policies (CSPs), two of which relate to air quality and air pollution. These are as follows:

CSP 40 Pollution Control and Protection

“Development will be expected to demonstrate that it is not likely to result, directly or indirectly, in an increase in air, surface water and groundwater, noise, smell, dust, vibration, light or other pollution which would unacceptably affect or cause a nuisance to the natural and built environment or to people.

We will not allow development of new housing or other environmentally sensitive development where existing air pollution, noise, smell, dust, vibration, light or other pollution levels are unacceptable and there is no reasonable prospect that these can be mitigated against. Developers will be expected to minimise the effects of any possible pollution and provide mitigation measures where appropriate”.

⁷ Air Quality Expert Group (AQEG) report – Air quality and climate change: a UK perspective, published for the Department for Environment, Food and Rural Affairs, Scottish Executive, Welsh Assembly Government and Department of the Environment in Northern Ireland, 2007

CSP 41 Developments in Air Quality Management Areas

“Development in air quality management areas will be expected to demonstrate that it will not have a harmful effect on the health or living conditions of any future users of the development in terms of air quality (including residents, employees, visitors and customers), or that any such harmful effects can be mitigated against.

We will only allow residential development in air quality management areas, where the developer provides an assessment that shows living conditions will be acceptable for future residents. We will only allow development in air quality management areas which could cause more air pollution, where the developer provides an assessment that shows there will not be a significantly harmful effect on air quality.

In assessing the significance of the air quality impact of proposed developments, the Council will continue to use the Environmental Protection UK guidance regarding development control and air quality (now updated). In light of this, there are no current plans for Barnsley MBC to develop its own supplementary planning documents relating to air quality”.