



Further Assessment of Nitrogen Dioxide for the Lewes District Council

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Executive Summary

This is the Further Assessment of air quality for the Lewes District Council (“the Council”). This assessment fulfils the Council’s next step of the Local Air Quality Management (LAQM) process and is required as a result of the findings of the Council’s earlier Detailed Assessment.

This earlier report identified that the government’s annual mean nitrogen dioxide objective might be exceeded in part of the Council’s area, specifically close to Fisher Street and High Street in Lewes. As a result the Council designated this area an Air Quality Management Area.

The purpose of this report is therefore to provide an updated assessment of this area, provide a detailed understanding of the sources of emissions contributing to this pollution in the area and consider a series of scenarios based on changing conditions.

To achieve this, new modelling predictions have been made for the report, and these include both improved modelling methods and treatment of emissions. The report also incorporates the most recent monitoring results for the above areas. The report thus meets the requirements of the technical guidance LAQM. TG (03) produced by the Department of Environment, Food and Rural Affairs (DEFRA).

The bias adjusted monitoring results for 2005 confirm that the annual mean objective is exceeded in Fisher Street, High Street and Market Street. The monitoring at the Council’s continuous site (Lewes 2) in Commercial Square however met the annual mean objective in 2005.

New verified modelled predictions were made for 2005. The predictions compared well with the 2005 monitored results despite the difficulties associated with modelling the narrow constricted and congested roads in the AQMA. The modelling confirms the extent of the area exceeding the objective, as being mainly confined to Fisher Street and the High Street.

Based on this model set up, additional model runs were undertaken to understand and apportion the sources of pollution in the area. This was undertaken for specific groupings of road vehicles. This source apportionment modelling was for oxides of nitrogen (NO_x) as the primary pollutant emitted, rather than NO₂, which is mainly a secondary pollutant.

The results of the source apportionment indicated that Cars as a group were the main individual group of sources. Although in some locations, the contribution from Cars was almost equalled by either Buses or HGVs. The contribution from Buses and HGVs combined, exceeded that of Cars and LGVs combined for the sites investigated. The contribution of the background sources also formed a major part of the total predicted NO_x at each site investigated.

A series of scenarios were modelled to understand the likely impact of changes over time and in response to changing vehicle flows. The scenarios modelled incorporate a base

case for 2010 incorporating the expected vehicle growth, a 2010 scenario with additional growth and a 2005 scenario with reduced growth.

The results for all scenarios indicate that annual mean NO₂ concentrations reduce from that of the 2005 base case. The 2010 base scenario indicates the greatest reduction in concentrations and it is only the Fisher Street location that is predicted to exceed the AQS objective, although parts of roads close to road centre lines do exceed the objective. The 2010 scenario with additional vehicle growth of 10% results in higher predicted concentrations than the 2010 base scenario and the 2005 scenario with reduced vehicles indicates least improvement compared to that of the 2005 base case.

A separate verified model run was undertaken for the A26 Malling Street, which is outside of the AQMA. The modelling undertaken for 2005 confirmed that areas of the road exceed the objective, although these areas do not include buildings with relevant exposure.

The Council is recommended to:

- a) Retain its existing AQMA and undertake consultation on the findings arising from this report with the statutory and other consultees as required.
- b) Use the results of the source apportionment work in this report to identify potential actions that will enable the Council to work towards improving air quality.
- c) Maintain its monitoring capability to confirm the findings of this report.

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1 Introduction to Further Assessment of Nitrogen Dioxide

1.1 Overview to Further Assessment

This report provides the further assessment of air quality for the Lewes District Council (“the Council”). This forms part of the Council’s duties under Local Air Quality Management (LAQM) process of the Environment Act 1995.

The report includes revised modelling studies of the Council’s Air Quality Management Area (AQMA), and Malling Street, which is outside of the AQMA. Source apportionment of the pollution sources has also been undertaken. Thus the report fulfils this step of the LAQM process.

1.2 Background

Local air quality management forms a key part of the Government’s strategies to achieve the air quality objectives under the Air Quality (England) Regulations 2000 and 2002. As part of its duties the Council completed its Updating and Screening Assessment of the seven LAQM pollutants and concluded that a Detailed Assessment was not necessary, although it undertook to carry out further monitoring in an area of the Lewes town centre.

The results of the further monitoring indicated Fisher Street in Lewes exceeded the 2005 annual mean objective for nitrogen dioxide (NO₂), as a result the Council carried out a Detailed Assessment based on the findings of its Air Quality Progress report. The Detailed Assessment of NO₂ identified a risk of the objectives being exceeded after 2005 in the Council’s area in close to the town centre of Lewes (in the Fisher Street and nearby streets) and as a result of this finding the Council designated part of the Lewes town centre an AQMA (see Figure 1). In addition to Fisher Street, the AQMA also includes adjoining roads, namely: Station Street, Market Street, High Street and West Street.

Table 1 NO₂ Air quality objectives relevant to this Detailed Assessment

Concentration	Measured as	Date to be achieved by
40µg m ⁻³	Annual mean	31-Dec-05

It should be noted that the one-hour mean (which is less stringent than the annual mean objective) does not need to be assessed further in this report.