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6.4 Environmental Statement Appendix 5.2 Air Quality Operational Assessment Methodology

Planning Act 2008

APFP Regulation 5(2)(a)
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6.4 Environmental Statement
Appendix 5.2 Air Quality Operational Assessment Methodology

Regulation Number:	5(2)(a)
Planning Inspectorate Scheme Reference	TR010056
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Version	Date	Status of Version
Rev C01	MAY 2021	Application Submission

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1 Operational assessment methodology

1.1 Introduction

1.1.1 This section includes details used in the operational assessment for air quality in ES Chapter 5 Air Quality (Document Reference 6.2).

Dispersion model and set up

1.1.2 The ADMS-Roads model (version 5.0.0) developed by Cambridge Environmental Research Consultants Ltd (CERC) has been used for this assessment. ADMS-Roads is a detailed atmospheric dispersion model, which focuses on road traffic as a source of pollutant emissions.

1.1.3 The model takes into account emissions from light and heavy duty vehicles, travelling at specified speeds along a road 'link' over a period of one hour, and predicts the dispersion of these emissions using appropriate historical meteorological data.

Traffic emissions

1.1.4 Traffic data has been provided for the air quality assessment by the Arup transport team. Road traffic emissions were calculated using the emission factors provided in the latest version (version 3.0) of Highways England speed band emissions factors spreadsheet[1].

NOx to NO_2 conversion

1.1.5 ES Chapter 5 Air Quality (Document Reference 6.2) sets out the approach to NOx to NO_2 conversion. Department for Environment, Food & Rural Affairs (Defra) background maps and associated tools were updated from a 2015 base year to a 2017 base year in May 2019. The base year in the assessment is 2016. Traffic data and monitoring data for 2016 has been provided and collected for the assessment.

1.1.6 The update to the Defra background maps showed that the 2015 base year maps were predicting concentrations which were lower than the updated 2017 predictions. Therefore, whilst the updated 2017 maps do not include 2016 data, the data for 2017 in the updated maps is considered to be more representative of 2016 than those provided from the 2015 base year.

1.1.7 In addition, it is not considered appropriate to use 2015 base year maps and associated tools for the model verification and to switch to 2017 data for the future year assessment. Therefore, the 2017 background maps and tools have been used throughout this assessment.

Minimum Monin-Obukhov length and surface roughness

1.1.8 The minimum Monin-Obukhov length describes the minimum stability of the atmosphere. For this model, a length of 10 metres was used representing the rural nature of the region.

1.1.9 The amount of mechanical turbulence (and hence, mixing) in the atmosphere is affected by the surface/ground over which the air is passing. Typical surface roughness values range from 1.5 metres (for cities, forests and industrial areas) to 0.0001 metres (for water or sandy deserts). In this assessment, a surface roughness of 0.3 metres was used, which represents the agricultural nature of the area.

Meteorological data

1.1.10 Meteorological data for one year (2016) from the Little Rissington meteorological monitoring station was used in the dispersion modelling. The Little Rissington meteorological monitoring station is located 16.8 miles (27 kilometres) east of the scheme.

1.1.11 Most dispersion models of roads do not use meteorological data if they relate to calm winds conditions as dispersion of air pollutants is more difficult to calculate in these circumstances. ADMS-Roads treats calm wind conditions by setting the minimum wind speed to 0.75m/s. Local Air Quality Management (LAQM) TG.16[2] guidance states that the meteorological data file is tested in a dispersion model and the relevant output log file checked to confirm the number of missing hours and calm hours that cannot be used by the dispersion model. This is important when considering predictions of high percentiles and the number of exceedances. The guidance recommends that meteorological data should only be used if the percentage of usable hours is greater than 75% and preferably greater than 90%.

1.1.12 The meteorological data selected from Little Rissington includes greater than 95% of usable data. This is above the 90% threshold and this data therefore meets the requirement of the Defra guidance.

1.1.13 The wind rose at Little Rissington (2016) is provided in Chart 1-1 of this appendix. The wind rose indicates that the study area is affected by predominantly south-westerly winds.

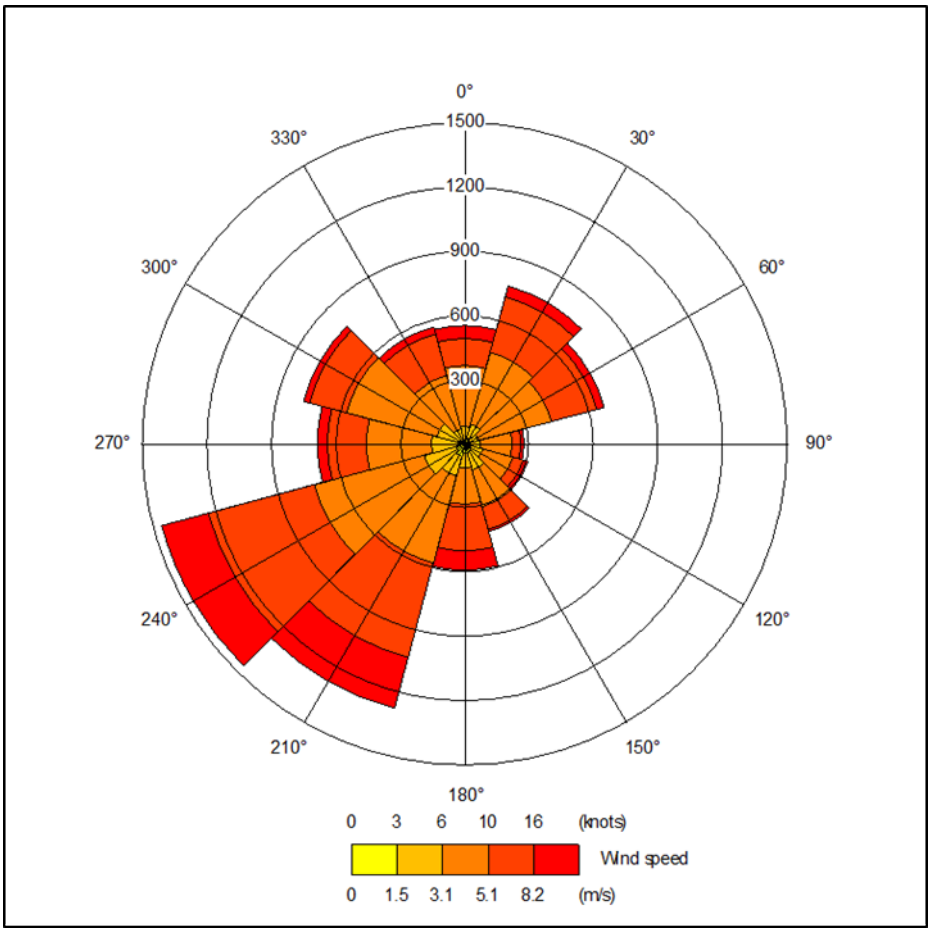

Chart 1-1 Wind rose for Little Rissington for 2016

End notes & References

[1] Highways England speed band emission factors for use with DMRB (version 3.0)
[2] Department for Environment Food & Rural Affairs, “Local Air Quality Management Technical Guidance (TG16),” 2018.