



Air Quality Review: West Midlands Interchange

December 2018



Experts in air quality
management & assessment

Document Control

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1 Introduction

- 1.1 Air Quality Consultants Ltd (AQC) has reviewed the information submitted in relation to air quality in support of the DCO application for the West Midlands Interchange.
- 1.2 This report reviews chapter 7 of the Environmental Statement and associated appendices (hereinafter referred to as the “assessment”).
- 1.3 This review has been carried out on behalf of South Staffordshire District Council (SSDC). It focuses on the potential impacts of the development on local residential properties and nearby designated ecological sites within South Staffordshire. This review covers the following issues:
- whether the scope of the assessment is sufficient;
 - whether due consideration has been given to potential cumulative impacts with nearby existing and permitted developments;
 - whether the air quality assessment is based on an appropriate methodology (i.e. is it ‘fit for purpose’);
 - the identification of any errors or omissions within the assessment;
 - whether the assessment of the overall significance of the proposed development is appropriate, and whether appropriate criteria have been adopted; and
 - whether the mitigation measures proposed are appropriate.
- 1.4 Where methodological failings are identified, they are described as either a:
- **Minor Issue** – weaknesses have been identified but the professional experience of the reviewers suggests that the weaknesses are unlikely to affect the conclusions of the assessment;
 - **Moderate Issue** – weaknesses have been identified which may or may not affect the conclusions¹; or
 - **Major Issue** – in the opinion of the reviewers, the failings of the assessment are highly likely to invalidate the reported conclusions.

¹ An issue which is classified as moderate could thus move to being either a major or minor issue depending on specific unknown factors.

2 Issues Raised in Scoping

2.1 SSDC raised two issues in relation to air quality in the Scoping Opinion:

- The validity of the Penkrige automatic monitoring data in 2013 and 2014; and
- Impact of the proposals on the truck stop, and the resultant impact on air quality and residential amenity.

2.2 The first issue is addressed by acknowledging the low data capture for the monitoring site in the report.

2.3 No specific consideration appears to have been given to the impact of the proposed development upon the truck stop within the Air Quality chapter, although reference is made to consideration of traffic capacity within chapter 15 of the ES, which has not been reviewed.

3 Review

Consideration of Uncertainty in Future Vehicle Emissions Factors [Moderate Issue]

- 3.1 The assessment has utilised the emission factors published by Defra. However, no consideration has been given to the uncertainty associated with future vehicle emissions projections.
- 3.2 This could potentially alter the conclusions of the assessment.

Baseline Year [Moderate Issue]

- 3.3 The baseline year is identified as 2015. It would have been most appropriate to have used the most recent year for which monitoring data are available (2016).

IAQM Impact Descriptors [Minor Issue]

- 3.4 The IAQM impact descriptors presented in Table 7.7 have been incorrectly represented. The first column should be labelled “1%”, not “<1%”. This would not have altered the conclusions as the results appear to have been correctly interpreted.

Model Verification [Moderate Issue]

- 3.5 The model has been verified separately for the receptors within each local authority. For receptors in South Staffordshire, the model results have been verified against measured data at nine monitoring sites. This indicated that the model was under-predicting concentrations and therefore an adjustment factor of 2.18 was applied to the modelled road-NO_x concentrations. Adjustment factors of this scale are fairly usual.
- 3.6 However, as shown in the Figure below (reproduced from the assessment), there is a large amount of scatter in the model results when they are compared with the measured values. At three of the sites, the final NO₂ concentrations fall outside the Defra guideline of +/-25%. In addition, the scatter suggests a very poor overall relationship between modelled and measured concentrations. As the actual predicted and measured values are not stated, it is not possible to evaluate the model performance against the criteria for R², RMSE and FB, as stated in LAQM.TG16; these data and calculations should be provided.
- 3.7 No model results are presented for the baseline year and it has not been possible to make a direct comparison with measurements and model predictions in the same year (other than the data points shown in the Figure). However, the results presented in Table 1 demonstrate that the predicted 2021 results at the monitoring sites (and therefore receptors) alongside the M6 are clearly too high. This is particularly apparent as 2021 concentrations would be expected to be lower than 2016 values, and in this instance they are higher.

- 3.8 As the 2015 baseline model results are not presented, it difficult to determine the extent of any under-prediction of the model at the other monitoring sites. This is particularly important for HA2 within the AQMA, which will be most sensitive to any changes in concentration as a result of the development. This may have resulted in the changes in concentrations being under-represented and could invalidate the reported conclusions.

Figure 7.2.7: Comparison of final modelled NO₂ with Measured NO₂ in South Staffordshire

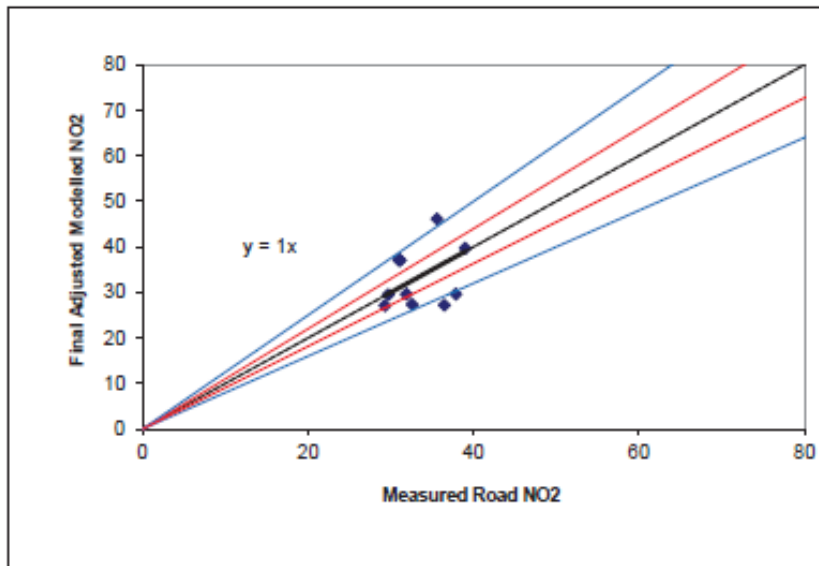


Table 1: Comparison of Measured Annual Mean Nitrogen Dioxide Concentrations with Model Results ($\mu\text{g}/\text{m}^3$)

Receptor	Measured 2016	Modelled 2021	Difference
PE2 – M6	31.1	Result not presented	N/A
PE11 – M6	31.4	42.9	11.5
ES4 – M6	35.6	38.9	3.3
ES5 – M6	32	44.1	12.1
ES6 – M6	31.4	39.5	8.1
HA2 – A5	37.9	21.6	-16.3
SA2 - Wedges Mills	32.6	23.7	-8.9
SA5- Wedges Mills	36.5	23.6	-12.9
SA6- Wedges Mills	29.3	23.6	-5.7

- 3.9 The predicted PM_{10} results have been verified using the factors derived for NO_x and therefore the same issues apply as outlined above. This has led to exceedences of the 24-hour mean PM_{10} objectives alongside the M6, where this is unlikely to occur.

Description of 24-hr PM_{10} Impacts [Minor Issue]

- 3.10 The IAQM impact descriptors have been incorrectly applied to determine the significance of the predicted changes in relation to the 24-hour PM_{10} objective. This has resulted in moderate and substantial adverse impacts being predicted that are unlikely to occur. This would not have altered the conclusions of the assessment.

Presentation of Results [Minor Issue]

- 3.11 The receptor names shown on the plans are different to those used in the tables where impacts are described. This makes it difficult to interpret the results, but would not alter the conclusions.
- 3.12 The existing baseline (2015) model results have not been presented, which it makes it difficult to determine how the model is performing at specific receptors. This would not alter the conclusions of the assessment but does make it difficult to review the validity of the results, as discussed in paragraphs 3.5 to 3.9.

Construction Dust Assessment [Minor Issue]

- 3.13 No plans of the receptors at risk of being affected by construction dust impacts are presented.

Railway Emissions [Minor Issue]

- 3.14 Paragraph 7.167 makes reference to background concentrations, “*without a reduction in road traffic emissions*”. This is not mentioned anyway else in the report and does not actually appear to have been considered.

Table 7.17 [Minor Issue]

- 3.15 Final row states “EFT” where it should state the number of negligible impacts in WCC. It is not clear what this means.

Idling Locomotives [Moderate Issue]

- 3.16 No consideration has been given to the impact of idling locomotives on air quality.

4 Summary

4.1 The air quality chapter of the ES has been reviewed. The conclusions and suitability of the assessment are set out in Table 2, along with any requirements for additional information.

Table 2: Summary of Air Quality Assessment

Impact	Conclusion of assessment	Suitability of assessment	Further information required?
Air quality impact of road traffic emissions	Not significant	Potentially under-estimated impacts in AQMA	Clarification on the model verification and model performance needs to be provided, with data presented in a transparent fashion. If 2021 predicted values are higher than 2016 measured, a justification for this conclusions should be provided
Construction phase traffic impacts	Not significant	Potentially under-estimated impacts in AQMA	Construction traffic is considered in the modelling of road traffic impacts in 2021, however, clarification is required about the model verification, as described above.
Air quality impact of railway emissions	Not significant	Acceptable for moving locomotives. Idling locomotives not considered.	Additional information required to determine whether idling locomotives would have an impact on air quality.
Construction phase dust impacts	Not significant	Acceptable	Commitment to dust mitigation measures commensurate with a High Risk site required (DCO requirement)
Ecological impacts	Potentially significant	Acceptable	States presented in Ecology chapter (not reviewed)

A1 Professional Experience

Penny Wilson, BSc (Hons) CSci MEnvSc MIAQM

Ms Wilson is an Associate Director with AQC, with more than seventeen years' relevant experience in the field of air quality. She has been responsible for air quality assessments of a wide range of development projects, covering retail, housing, roads, ports, railways and airports. She has also prepared air quality review and assessment reports and air quality action plans for local authorities and appraised local authority assessments and air quality grant applications on behalf of the UK governments. Ms Wilson has arranged air quality and dust monitoring programmes and carried out dust and odour assessments. She has provided expert witness services for planning appeals and is Member of the Institute of Air Quality Management and a Chartered Scientist.

Stephen Moorcroft, BSc (Hons) MSc DIC CEnv MEnvSc MIAQM

Mr Moorcroft is a Director of Air Quality Consultants, and has worked for the company since 2004. He has over thirty-five years' postgraduate experience in environmental sciences. Prior to joining Air Quality Consultants, he was the Managing Director of Casella Stanger, with responsibility for a business employing over 100 staff and a turnover of £12 million. He also acted as the Business Director for Air Quality services, with direct responsibility for a number of major Government projects. He has considerable project management experience associated with Environmental Assessments in relation to a variety of development projects, including power stations, incinerators, road developments and airports, with particular experience related to air quality assessment, monitoring and analysis. He has contributed to the development of air quality management in the UK, and has been closely involved with the LAQM process since its inception. He has given expert evidence to numerous public inquiries, and is frequently invited to present to conferences and seminars. He is a Member of the Institute of Air Quality Management.

Full CVs are available at www.aqconsultants.co.uk.