M11 J7a

Essex County Council

Response to external review of M11 J7a Air Quality Assessment

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1. Introduction

On behalf of Ringway Jacobs (RJ) and Essex County Council (ECC), Jacobs produced an Environmental Statement (ES) to report the findings of the Environmental Impact Assessment (EIA). Air Quality Consultants (AQC) provided a review of the air quality chapter on behalf of ECC Planning.

This report details the responses by Jacobs to the recommended actions identified by AQC.

2. AQC Summary and Recommended Actions

2.1 Action Recommended

2.1.1 Section 3.2

- AQC Comment
    - Table C2 in Appendix 5.1 should be corrected

<u>Jacobs' Response</u>

The values provided under the headings 2104 Base, 2021 DM and 2021 DS are incorrect. Total NO_2 concentrations are presented rather than N-deposition rates.

The change (DS-MD) results presented in Table C2 are correct however and form the basis of the conclusions made in the air quality chapter.

The information identified can updated upon instruction from Essex County Council; however, this would not change any conclusions of the air quality chapter.

- AQC Comment
    - There should be a clear assessment of the impacts of both NOx, nitrogen deposition and acid deposition on Epping Forest SSSI and ecosystems more generally, addressing points raised in paragraphs 2.17 to 2.19, 2.26 to 2.32 and 2.40 of this review.

<u>Jacobs' Response</u>

Results of the assessment of annual mean NO_x at Epping Forest SSSI are presented in Table C1, and results of the assessment of N-deposition at Epping Forest SSSI are presented in Table C2.

Acid deposition is not required to be assessed under DMRB HA207/07; consequently, it did not form part of the scope of the air quality assessment.

2.1.2 Section 2.17

- AQC Comment
    - For the local impacts in relation to the sensitive ecosystems, no consideration has been given to acid deposition.

<u>Jacobs' Response</u>

See Jacobs' response above.

2.1.3 Section 2.18

- AQC Comment
    - The basis and source of the critical load cited in Appendix 5.1 is not provided.

Jacobs' Response

The basis and source of the critical loads cited in appendix 5.1 are provided in Section 5.4.1 Baseline sources and conditions of the air quality chapter. These data have been sourced from the APIS website (www.apis.co.uk).

2.1.4 Section 2.19

- AQC Comment
  - There is no mention in this section of the baseline conditions at the designated ecosystem sites.

Jacobs' Response

This is acknowledged. There are no strict guidelines to include this information within the baseline section. We do not consider that such an assessment would add much value other than to confirm if the locations currently exceed critical levels and critical loads. Future baseline (DM) results are however reported in Tables C1 and C2.

2.1.5 Section 2.26

- AQC Comment
  - This incorrectly refers to the ecosystem modelling results being in Appendix 5.3; they are in Appendix 5.1

Jacobs' Response

This is acknowledged as a typographic error.

2.1.6 Section 2.27

- AQC Comment
  - The change (DS-DM) results presented in Table C.2: N-deposition are incorrect. For example, the results for 'Epping Forest 0' location are 64.7 DS, 63.7 DM and the change is therefore 1.0, but it given as 0.1. (The calculations in Table C.1: NOx Concentration are correct; 156.3 DS, 153.1 DM and the change is 3.2 as given in the table).

Jacobs' Response

The values provided under the headings 2104 Base, 2021 DM and 2021 DS are incorrect. Total NO_2 concentrations are presented rather than N-deposition rates.

The change (DS-MD) results presented in Table C2 are correct however and form the basis of the conclusions made in the air quality chapter.

Section 2.28

- AQC Comment
    - There is no assessment of the impacts on the Epping Forest SSSI of either NOx or N-deposition. The critical levels are clearly exceeded, and the change is up to 3.2 mg/m^3. In relation to IAN174 this represents a large change.

<u>Jacobs' Response</u>

An assessment for annual mean NO_x concentration and N-deposition rate was undertaken for Epping Forest SSSI with the results presented in Appendix 5.1 (specifically Tables C1 and C2).

Table C1 indicates annual mean NO_X concentrations to exceed the annual mean air quality objective (30 µg/m^3) and changes to be greater than 1% of this objective value at Epping Forest SSSI.

Table C2 indicates changes to N-deposition rates to be not greater than 1% of the lower limit of the relevant critical load at Epping Forest SSSI and was consequently not reported in the air quality chapter.

2.1.7 Section 2.29

- AQC Comment
    - Reference is made to "the closest three Natura 2000 sites". This is the first reference in the Chapter to Natura sites. Table 5.3 refers to three sites that are SSSIs, but no mention is made of Natura sites. Where are the Natura sites? Why have they not been assessed?

<u>Jacobs' Response</u>

Natura 2000 sites are a network of sites designated under the Habitats and Birds Directive (Special Areas of Conservation (SAC) and Special Protection Areas (SPA))

While the statement is technically correct, Natura 2000 sites are not required to be, nor were, assessed as part of DMRB HA207/07.

Additionally, the sites referenced lie outside the air quality study area (200m from any affected road) and can therefore be considered unlikely to be significantly impacted by changes in air quality as part of the proposed scheme.

2.1.8 Section 2.30

- AQC Comment
    - Chapter 8, page 102 has the following statement "The Air Quality chapter concluded that there were unlikely to be any significant effects upon the Epping Forest SAC and it was not considered necessary to undertake an Appropriate Assessment." There is nothing in the Air Quality chapter that addresses this. (The Epping Forest SAC is not the same as the area of Epping Forest SSSI that has been assessed in the Air Quality chapter). There is nothing in Chapter 8 that addresses the impacts of air quality on the Epping Forest SSSI.

Jacobs' Response

Epping Forest SAC lies outside the air quality study area (200m from any affected road) and was therefore not considered as part of any assessment undertaken; due to it being outside the study area it can be considered unlikely to be significantly impacted by changes in N-deposition as part of the proposed scheme.

2.1.9 Section 2.31

- AQC Comment
  - Chapter 8, pages 115/116, also refer to The Mores Wood site saying it could have some sensitivity to nitrogen enrichment; however, there is no mention of this site in Chapter 5. Furthermore, Chapter 8 says that because NOx concentrations will be less in 2021 than 2014, there is no need to consider the impacts further; but no mention is made of how the scheme may change NOx concentrations in 2021, which should be the basis of the assessment of effects.

Jacobs' Response

Mores Wood is not an Internationally or Nationally designated ecological habitat site and therefore lies outside the scope of the air quality assessment.

2.1.10 Section 2.32

- AQC Comment
  - Section 5.3.2.2 page 40 says that NOx will be assessed against the critical level and that critical levels and N-deposition have been assessed in Chapter 8. Neither of these matters has been dealt with.

Jacobs' Response

An assessment for annual mean NO_x concentration was undertaken with the results presented in Appendix 5.1 (specifically Table C1).

Whereas the air quality chapter states that:

"critical levels and N-deposition have been assessed in Chapter 8".

What is meant is that the conclusions on the significance of impacts on Nature Conservation made in Chapter 8 have incorporated an evaluation of NO_x critical levels and N-deposition. No explicit assessment of these parameters has been made within this Chapter.

It is acknowledged that this statement is unclear and may lead the reader to expect to see something more explicit in Chapter 8.

2.1.11 Section 2.40

- AQC Comment
  - The seventh bullet point on page 51 says there will be a worsening at the edge of the Epping Forest SSSI, but that it is unlikely to be significant. This is not supported by a clear assessment, as highlighted elsewhere in this review.

<u>Jacobs' Response</u>

It is acknowledged that it is unclear how this statement is supported.

Annual mean NO_X concentrations were assessed at Epping Forest SSSI (Table C1). As concentrations were predicted to exceed the annual mean air quality objective (30 µg/m^3) and changes to be greater than 1% of this objective value, changes to N-deposition rates were also assessed at Epping Forest SSSI (Table C2).

In accordance with Highways England guidance HA207/07 and IAN 174 Updated advice for evaluating significant local air quality effects, these data were passed to the scheme ecologist for consideration in concluding on the significance of impacts on Nature Conservation.

Chapter 8 "Nature Conservation" does not conclude that the impacts on Epping Forest SSSI are significant and this is the basis for the statement made in the air quality chapter.

2.2 Clarifications Sought

2.2.1 Section 3.3

- AQC Comment
  - Have vehicle speeds been reduced near to junctions (see paragraph 2.9)?

<u>Jacobs' Response</u>

Vehicle speeds have been reduced near to junctions in line with guidance provided in Defra technical guidance LAQM.TG(16).

These speeds were subsequently categorised according to Highways England IAN 185/13 Updated traffic, air quality and noise advice on the assessment of link speeds and generation of traffic data into speed-bands.

- AQC Comment
  - Have relevant sections of road been modelled as canyons (see paragraph 2.12)?

Jacobs' Response

Relevant sections of road have not been modelled as canyons. Within the study area only a small number of locations were identified as potential candidates for modelling as road canyons.

As no local monitoring data was available that was also considered representative of such conditions, it was concluded not to model these locations as road canyons as model results would not be able to be verified.

It was noted that locations identified as potential candidates for modelling as road canyons were anticipated to experience reductions in emissions as a result of the proposed scheme.

- AQC Comment
  - Are the regional emissions calculated for the same links in each scenario (see paragraph 2.15)?

Jacobs' Response

Regional emissions were calculated for the same links in the Affected Road Network (ARN) in each DM and DS scenario.

- AQC Comment
  - Is the statement referring to 24-hour PM10 based on PM10 modelling and if so where are the results (see paragraph 2.24)?

Jacobs' Response

The statement referring to 24-hour PM_{10} is based on annual mean PM_{10} modelling.

It is acknowledged, that while the air quality chapter clearly states that Defra technical guidance LAQM.TG(16) has been adopted for the consideration of short-term (1-hour mean) NO_2 concentrations (Table 5.1), it was not made clear that this approach was also adopted for the consideration of short-term (24-hour mean) PM_{10} concentrations.

PM_{10} results were not reported as no exceedances of the annual mean PM_{10} objective were predicted.

In light of disclosing (above) that 24-hour PM_{10} is based on annual mean PM_{10} modelling, the statement referring to 24-hour mean PM_{10} is supported by text provided in the paragraph two paragraphs below it; specifically, that:

> ***"The maximum modelled annual mean PM_{10} concentration would be at Receptor 205250 (22 Hockerill Court, Bishops Stortford) at 25.7 µg/m^3 in the DM scenario."***

- AQC Comment
  - Why have the beneficial impacts within the AQMAs been overestimated and what does this mean for the modelling (see paragraph 2.34)?

Jacobs' Response

Model verification was undertaken using monitoring data from two sources, Highways England and East Hertfordshire District Council (EHDC).

The results of the verification showed there was a large underestimation of modelled NO_x roads concentrations within the two AQMA where monitoring data was from EHDC.

Modelled NO_x roads concentrations on links within the AQMA were consistent with other predictions for roads with similar emission rates outside the AQMA. Monitored total NO_2 concentrations however, were consistently higher in the dataset from EHDC than those from Highways England despite, after investigation, there being no obvious reason for the difference in values.

Although shown to be consistently higher than those data in the Highways England dataset; there was no reason to disregard the monitoring data from EHDC. As such, these data were used to verify annual mean NO_2 predictions within the AQMA.

Due to the increased discrepancy between modelled and monitored values within the AQMA, a large adjustment factor was applied to predictions within these locations. The use of a large adjustment factor was considered to artificially magnify the beneficial changes predicted to occur as a result of the proposed scheme at these locations.

In terms of the modelling therefore, it was considered that while benefits would be likely to occur at these locations; the magnitude of the benefits were likely to be overestimated.

- AQC Comment
    - How was the judgement reached that the overall impacts would be 'not significant' rather than 'significant beneficial'?

Jacobs' Response

Due to the uncertainty considered to be attributed to the overestimate of beneficial impacts within the AQMA, a conservative approach was taken such that their influence was removed from the evaluation of scheme effects.

A confident judgement of 'not significant' was concluded therefore rather than a judgement of significant beneficial effect which would be based on greater uncertainty.

2.3 Useful Further Information Requested

2.3.1 Section 3.4

- AQC Comment
  - There is some additional information that would be useful for the applicant to provide:
    - The Information on traffic data used in air quality modelling (see paragraph 2.8).
    - A map showing the PCM links which overlap with the affected road network, together with the PCM concentrations and the scheme impacts (see paragraph 2.25).
    - A brief consideration of cumulative impacts (see paragraph 2.42)

Jacobs' Response

Jacobs consider that the provision of the information, while potentially useful, would neither materially support, detract from nor alter the conclusions of the air quality chapter.

The information identified can be made available upon instruction from Essex County Council.

3. Jacobs' Summary and Conclusion

A review was undertaken by AQC and provided comments on the air quality chapter. These comments have been highlighted and addressed within this report.

It is concluded that given the responses provided in this report, all actions recommended, clarifications sought and useful further information requested have been addressed.

No further action is required and no changes to the air quality chapter are necessary.

The conclusion of the air quality assessment remains valid, namely that the residual effects of the proposed scheme on air quality are anticipated to be not significant.