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Project name:
Didcot Garden Town Schemes

Project ref: 60606782

From:
AECOM

Date:
16th March 2022

**To: Oxfordshire County Council (OCC)
Local Planning Authority**

Memo

Subject: Appleford Parish Council - Air Quality Comments Response

This note provides AECOM's response to the comments dated 7th February 2022 from Appleford Parish Council relating to the Air Quality Assessment for Planning Application R3.0138/21, HIF1 road between A34 Milton Interchange and B4015 north of Clifton Hampden.

AECOM's responses are provided in blue text below each point and relate to the Air Quality Chapter 6 and Population and Health Chapter 13 of the Environmental Statement (ES) volume 1, with reference to the scheme's Transport Assessment.

1.0 Basis for Refusal

The application for the development of the HIF1 road should be refused planning permission for the following reasons.

The proposal fails to comply with the following parts of Local and County Plans:

1.1 South Oxfordshire District Council

SOLP – Policy EP1 Air Quality; In so far as the Air Quality Assessment for this significant development is inadequate and fails to account for cumulative impact in the sector, Didcot to River Crossing.

SOLP – Policy ENV12 Pollution – (Impact of Development on Human Health, the Natural Environment and/or Local Amenity (Potential Sources of Pollution)); The development will result in significant cumulative impact on health and amenity in the sector Didcot to River Crossing.

Response to 1.1:

The air quality assessment includes the cumulative impacts of committed schemes within the study area as the impact of these on traffic flows are included within the modelled traffic data which was used as the basis to model the HIF1 scheme. The air quality impacts of the scheme are not significant and as such the scheme is in line with relevant planning policy.

1.2 Vale of White Horse District Council

VoWHLP – Development Policy 23: Impact of Development on Amenity. In so far as the development will result in significant adverse cumulative -impacts on Appleford Village in respect of visual intrusion, noise, emissions and road lighting .

VoWHLP – Development Policy 26 Air Quality. The Air Quality Assessment for this development is inadequate and has not demonstrated that it has been design to minimise the impact on air quality in the adjacent community of Appleford.

Response to 1.2:

The air quality assessment of the scheme concluded that there will be no exceedances of the air quality objectives and no significant impacts are reported. Therefore, there is no requirement to put in place any scheme specific mitigation to improve air quality.

1.3 Health Impact Assessments

District Council policies identify the need for Health Impact Assessments (HIA) to be conducted for all strategic developments to determine how the development will improve health and wellbeing.

OCC , LTCP 2021 policy 12 states : *12 – Oxfordshire County Council will require transport plans and infrastructure schemes to deliver health benefits and to mitigate any negative impacts by:*

a. Requiring all major schemes or plans where potential health issues are likely to arise, to screen for possible health and wellbeing impacts.

b. Requiring a Rapid or Full HIA to be submitted for larger-scale infrastructure proposals.”

The HIF1 scheme has not been subject to a Health Impact Assessment (HIA) as required in District Council policies, LTCP 2021 and as suggested by Oxfordshire’s Director of Public Health.

The proposal is not based on analyses to minimize pollution and emissions at existing communities adjacent to the proposed road, to be demonstrated through an HIA.

Response to 1.3:

The Oxfordshire Local Transport and Connectivity Plan is still currently in draft form and has not been formally adopted. A draft was released in Jan 2022 for consultation. The planning application was submitted to OCC as the LPA in Autumn 2021 so was not available at the time of assessment. In addition, the policy explanation states this policy would apply to future development, the Didcot HIF1 scheme has a valid planning application and is therefore current development.

Whilst a specific HIA was not conducted, Chapter 13: Population and Human Health of the ES has followed Design Manual for Roads and Bridges (DMRB) guidance to consider air quality, noise and visual impacts on the human health of nearby sensitive receptors, such as residents. This chapter has considered numerous health determinants such as average life expectancy, average wealth and deprivation as well as data on hospital admissions for lung diseases and deaths from respiratory diseases within the study area.

2.0 Environmental Statement Chapter 6, Air Quality

This document (Didcot HIF1 ES Chapter 6 Air Quality) submitted to accompany the application contains inaccuracies and limitations that renders it unreliable to assess the impact of the proposal on public health for reasons as explained below.

2.1 Section 6.2 makes no reference to the air pollution guidelines produced by the World Health Organisation (WHO).

In their response to this planning application, the UK Health Security Agency has advised OCC that :

“Reducing public exposures to non-threshold pollutants (such as particulate matter and nitrogen dioxide) below air quality standards has potential public health benefits. UKHSA support approaches which minimise or mitigate public exposure to non-threshold air pollutants.”

Recently updated WHO guidelines (2021) are based on the evidence that toxic particles and gases harm human health at much lower concentrations than previously thought. Current WHO guidelines for annual emissions limits pollutant concentrations to 5 µg/m³ for particulates PM_{2.5} and 10 µg/m³ for nitrogen dioxide NO₂. It is now recognised that UK legislation is no longer adequate to assess the impact of new road proposals. The permitted emissions assumed in the HIF1 Air Quality Assessment exceed the current WHO guidelines by 500% for PM_{2.5} and 400% for NO₂. Whilst there are difficulties in reducing current emissions for existing roads there are no such difficulties in assessing a new road proposal in an area where existing emissions are low. The highest standard for AQ needs to be adopted for new sections of the HIF1 road. Appleford village is one community lying closest to a new section of the proposed road. It is reasonable to position the road in relation to Appleford to ensure that the road does not, in itself, create toxic emissions in excess of the WHO guidelines. If more punishing level of emissions are to be considered to facilitate the road, this must be through consultation and agreement with the communities that will be affected. OCC undertook no consultation with affected Parish Councils and residents of parishes like Appleford to agree emission standards to assess the road proposal.

Response to 2.1:

The air quality assessment has followed the methodology and guidance set out in the Design Manual for Roads and Bridges (DMRB) LA 105 Air Quality¹ guidance document for highways schemes as outlined in the scheme scoping report.

The DMRB guidance sets out the requirements for assessing air quality in line with the EU Air Quality Directive² and whether there is a risk of the scheme's impacts will affect the UK's reported ability to comply with the directive. The assessment has therefore taken into account the current UK air quality objectives as set out in the legislation and the EU limit values in the Directive. The results of the assessment show that predicted NO₂ and PM₁₀ concentrations are below the annual mean and short-term air quality objectives as set out in the UK legislation.

Published 2019 annual mean background pollutant concentrations range from 12.4- 12.7 µg/m³ for NO₂, 15.7-15.8 µg/m³ for PM₁₀ and 9.7 µg/m³ for PM_{2.5} around Appleford. These concentrations are well below the annual mean air quality objectives of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} and below the 2005 WHO air quality guidelines³ of 20 µg/m³ and 10 µg/m³ for PM₁₀ and PM_{2.5} respectively. The WHO guidelines are aimed at informing legislation and policy but are not legally binding in the UK which means there is no requirement to assess pollutants against these guideline levels.

Since the publication of the ES, the WHO guidelines have been tightened and more stringent targets for PM_{2.5} are likely to be set under the Environment Act 2021⁴. However, no new targets in UK legislation have been set nor any consultation started on what thresholds the government may adopt in the future.

OCC has undertaken consultation on the scheme. The HIF1 Scoping Opinion Report which set out the methodology for the air quality assessment was sent to all statutory consultees, including the Parish Council. Comments were received back from the district councils and other Parish Councils, but not Appleford Parish Council. OCC has also had a number of meetings with the Parish Council. For example, at the meeting 1st July 2021, OCC presented the baseline air quality survey data and emerging results from the air quality assessment for the draft ES.

2.2 In so far as the change to air quality, due to the proximity of the proposed HIF1 road close to communities like Appleford, has not been properly assessed, the road scheme does not follow the Planning Policy Guidance of the NPPF.

Response to 2.2:

The National Planning Practice Guidance has been followed for the assessment. Considerations have been given to potential trends in air quality in the presence and absence of development, as well as any impacts and mitigation / improvement opportunities arising from the scheme.

¹ Highways England, Design Manual for Roads and Bridges, Sustainability & Environment Appraisal, LA 105: Air quality, 2019.

² DIRECTIVE 2008/50/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2008 on ambient air quality and cleaner air for Europe.

³ WHO global air quality guidelines Global update 2005. https://www.euro.who.int/_data/assets/pdf_file/0005/78638/E90038.pdf

⁴ Environment Act 2021. <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>

2.3 The document makes no attempt to model PM_{2.5} (as section 6.4.17 confirms). There is increasing awareness that smaller particulates have a critical effect on respiration. The Air Quality Analysis is therefore incomplete.

Response to 2.3:

The assessment has followed the DMRB LA 105 guidance for highways schemes. This document states the following in terms of PM_{2.5} modelling:

“2.21.4 There should be no need to model PM_{2.5} as the UK currently meets its legal requirements for the achievement of the PM_{2.5} air quality thresholds and the modelling of PM₁₀ can be used to demonstrate that the project does not impact on the PM_{2.5} air quality threshold.”

National Highways has not published any plans for the DMRB to include PM_{2.5} within its methodology.

As stated in the response to 2.1, background concentrations are well below current air quality objectives for PM₁₀ and PM_{2.5}. The air quality assessment has followed the DMRB guidance and has predicted PM₁₀ concentrations at selected receptors in a baseline year and future opening year with and without the HIF1 scheme. Levels are predicted to be below the UK air quality objective of 40µg/m³, with a maximum concentration of at selected receptors of 18.8 µg/m³ in the 2019 baseline year across the study area and a maximum of 16.7 µg/m³ within the Appleford area. Concentrations in the future year with and without the scheme are predicted to decline compared to the baseline. As PM_{2.5} is a component of PM₁₀, predicted concentrations will be lower than this, and therefore will be well below the PM_{2.5} air quality objective value of 25 µg/m³.

2.4 There have been no adequate measurements of the current levels of NO₂ and PM_{2.5} at property boundaries for critical areas in Appleford. A single roadside measurement at a junction of the village Main Road and Church Street (table 6.10 location RIV3) indicated an annual NO₂ mean of 25.5 µg/m³. Unfeasibly this appears to exceed all roadside values measured at the busy A4130 between the A34 and Didcot. This single measurement, possibly in error, cannot be relied upon to characterise the current air quality in Appleford. The Air Quality Assessment has no reliable basis to predict the change to Appleford's air quality

2.5 With insufficient local air quality monitored data for Appleford, the air quality dispersion model, as described in paragraph 6.4.25) cannot be calibrated to real data. The output from the dispersion model for Appleford is therefore unreliable.

Response to 2.4 and 2.5:

Monitoring of NO₂ was carried out at 27 locations near the HIF1 scheme for a period of 6 months, using triplicate tubes. Along with RIV3, there were 3 other monitoring locations within 1km of Appleford Village (RIV2, RIV4 and RIV5). These data were used to supplement the existing local authority monitoring data to verify the performance of the air quality model. It is highly unusual to do any baseline monitoring of PM_{2.5} for highways schemes, especially in rural areas with low pollutant concentrations. Vale of White Horse District Council do not currently monitor levels of particulates within their district.

A thorough review of the performance of the air quality model at each of the monitoring sites was conducted to analyse the reasons for under and over predictions at the monitoring sites and to determine whether a more zonal verification was appropriate. The model performance was found to vary across the network. The model was found to perform particularly well along the A4130 dual carriageway. Apart from this section of the road network, there were no other individual areas where it was judged appropriate to put into a separate verification zone. Therefore, the verification and adjustment process was applied to two separate domains. The first deals with the majority of the road network, (zone A which includes Appleford and RIV3) and the second (zone B) deals with the conditions along the A4130 dual carriageway alone.

2.6 Contrary to paragraph 6.4.28, as there is insufficient local air quality monitored data for Appleford, existing pollutant concentrations from specific local activities have not been included in the assessment, e.g. rail aggregate handling at Appleford Sidings, asphalt works at Appleford Sidings, landfill and HGV movements immediately south west and upwind from Appleford.

Response to 2.6:

Background concentrations were combined with the model outputs to obtain total pollutant concentration at receptors. The background concentrations (published by Defra and the Devolved Administrations) provide an

estimated breakdown of the relative sources of pollution. These include emissions from various sectors, including industrial emissions (combustion in industry, energy production, extraction of fossil fuel and waste) and rail emissions. No site specific information was available to include the above mentioned activities explicitly in the air quality model so their estimated emissions were included within the background concentration as part of the model predictions. HGV movements to the industrial processes south of Appleford are captured within the traffic and air quality model.

In addition, the monitoring data will be influenced by emissions from other sources as well as road traffic. These data were used to verify the performance of the air quality model and so will have been captured in the assessment.

2.7 The modelled pollutant concentrations at “public exposure receptors” along Main Road in Appleford, (locations R107, R26, R90, R69, R24, R100, R66, R74, in table 2 of ES vol III Appendix 6.2) are not based on credible traffic flows. Restrictions on HGV will continue to apply through Appleford village. Speed restrictions will apply and be tightened with or without the HIF road. The modelled reduction in NO₂ along Main Road due to the HIF is not credible. The only location of monitored real data, (location R107, matched to location RIV3), shows modelled values from the road well below the present measured value. The contribution from HIF1 and also local road traffic on top of other sources of pollution is not explored or explained.

Response to 2.7:

The air quality assessment has used modelled data from the Paramics transport model which is used for the transport assessment. The model is based on traffic count data conducted in 2017 to verify the baseline situation and forecast to future years. The traffic model predicts that there will be a significant reduction in traffic flow along Appleford Main Road with the scheme in place. As a result, there are improvements in air quality predicted at properties situated close to Main Road.

Modelled NO₂ concentrations at Receptor R107 are lower than those measured at RIV3. This is because site RIV3 is a kerbside location (approx. 0.8m from the kerb) and R107 is located further back from the road on the façade of the building (approx. 6m from the kerbside). The levels of pollutant concentrations drop significantly with increasing distance from the road which is why concentrations are lower at the property façade.

2.8 THE HIF1 Planning statement. para 7.11.2 asserts that “*the Site is not considered particularly sensitive in terms of air quality*”. And “*there will be no exceedance of the objective for annual mean NO₂* “. [HIF ES Chapter 6 Air Quality, section 6.9] confirms “that no specific, essential or enhanced air quality mitigation measures have been incorporated into the Scheme design.” And “*no monitoring of significant effects is proposed*” para 6.11.2

There is no justification for these statements moreover they conflict with the following statement.

[HIF1 ES Chapter 6 Air Quality] states “*Higher traffic flows and average speeds are expected on the new proposed roads and bridges when compared (to) a do minimum situation without these roads. This could lead to higher emissions and higher annual mean concentrations of NO₂, NO_x, and PM₁₀ at sensitive receptors close to these new roads in the opening year with the Scheme when compared to the opening year without the Scheme.*”

Due to extensive errors and omissions in the Air Quality Assessment the true magnitudes of the resulting emissions in communities close to the proposed road have not been established and are likely to be under reported.

Response to 2.8:

The Parish Council’s first paragraph relating to para 7.11.2 in the ES refers to the fact that air quality levels are well below the objective values and are therefore considered to be good. This statement relates to the impact of the Scheme after the detailed modelling was conducted. Therefore, no mitigation is required as per the conclusions of the assessment. The air quality assessment was conducted in line with the DMRB Guidance using the available traffic data and has been peer reviewed and accepted by Oxfordshire County Council and Vale of White Horse and South Oxfordshire District Councils. Therefore, we do not accept that there are errors and omissions in the assessment.

The Parish Council's second paragraph is taken from Section 6.8 'Potential Impacts' of the report. This section is written prior to conducting the modelling to provide a general overview of the objective of the scheme and the potential to affect air quality.

2.8 [HIF1 ES Chapter 6 Air Quality. Para 6.10.16] refers to modelled levels of NO₂ and states "*The largest increase in annual mean NO₂ concentration is predicted at a residential property north of Hall Farm (R75, Appleford). With the Scheme in operation, the annual mean NO₂ concentration predicted at this receptor in the Scheme opening year is 16.0µg/m³, an increase of 3.3µg/m³ from 12.7µg/m³*". This statement is likely to be the nearest reflection of the effect of the HIF road on the dwellings along Main Road in Appleford. However this assessment fails to include existing emissions from the adjacent industrial activities around Appleford sidings. Moreover, the modelling is for a ground level road, at this location. Pollutants will distribute more widely from the proposed elevated HIF road which will be above roof level as it passes Appleford dwellings. The total pollution load and extend of distribution is likely to be well in excess of these figures.

Response to 2.8:

The annual mean concentrations presented in report includes background concentration which take into account the contribution from emissions from various sectors such as industrial processes (see response to point 2.6).

The new HIF road was modelled at ground level which is a worst case assessment to assess the impacts at sensitive receptors at breathing height (1.5m) than if the road was modelled at an elevated level (between 5m and 10m). If this elevation had been modelled for the ES, emissions would be released at a height above the nearest properties, which would have a lower impact at those properties nearest to the HIF1 road, due to greater dispersion and reduction in pollutant concentrations. The results of a sensitivity test to model elevation are given in Table 1 in Appendix A to demonstrate that the scheme ES has presented a worse case.

2.9 [HIF1 ES Appendix 6.2 Local Air Quality Assessment Results] states at paragraph 1.2.12 "*Along the Didcot to Culham River Crossing on the east side there are 12 receptors (R24, R25, R26, R27, R66, R68, R69, R74, R90, R100, R107 and R116) in Appleford which are predicted to experience decreases in annual mean NO₂ concentrations of 0.5µg/m³ to 2.8µg/m³ resulting in predicted concentrations of 12.9µg/m³ to 14.9µg/m³. This improvement is due to a predicted reduction of approximately 4,000 AADT on Main Road through Appleford.*"

This statement does not represent the actuality of the relationship between traffic on Main Road, Appleford and traffic on the proposed HIF1 road adjacent to Appleford. Main Road has weight restrictions prohibiting HGV traffic now and in the future. Traffic calming measures or vehicle restriction for commuter cars on Main Road must be in place if there is a future traffic growth, either due to the HIF1 road or other road scenarios. There should be no substantial increase in traffic on Main Road (B4016) for future scenarios. The Air Quality Assessment is therefore in error. The HIF1 road will not create a reduction in NO₂ concentrations through Appleford village. However, the siting of HIF1 as an arterial road, will bring many HGVs within 60m of dwellings in Appleford. This is unprecedented and poses a substantial increase in all forms of traffic emissions close to Appleford, which is not represented in the Air Quality Assessment.

Response to 2.9:

The air quality assessment has used traffic data from the transport assessment. The traffic model data has been provided with and without the scheme. As noted in response 2.7, the traffic model for the HIF1 scheme predicts that there will be a reduction in traffic flows through Appleford Main Road with the scheme in place, and in particular there is a substantial reduction in the numbers of HGV on this road as these vehicles will use the HIF1 road. The air quality model has taken into account the emissions from both of these roads. Due to the distance of the HIF1 road from many of the residential properties in Appleford and the fact that emissions drop off quickly from the road, the reduction in traffic flow along Main Road is the primary reason for the reduction in air quality predicted at many properties located close to Main Road.

A sensitivity test was carried out to assume that the HGV restriction is enforced in Appleford. For the Do Minimum scenario, this would mean that there are fewer vehicles travelling along the B4016 where the restrictions apply. The results of this sensitivity test are given in Table 2 in Appendix A. There is no change to the results with the scheme in place, but there is a slightly lower benefit due to the scheme as the predicted reduction in HGVs as presented in the ES would not be seen. In both the ES and the HGV restriction

sensitivity test the concentrations predicted are well within the air quality objective for NO₂. This means that that the benefits of the scheme are not significant in this HGV restriction sensitivity test or the scheme ES.

2.10 [HIF1 ES Appendix 6.2 Local Air Quality Assessment Results] states at paragraph 1.2.13 “*There are three receptors (R23, R65 and R75) close to the new road which are predicted to experience increases in annual mean NO₂ concentrations of 1.5µg/m³ to 3.3µg/m³ resulting in predicted concentrations of 14.3µg/m³ to 16.0µg/m³. This deterioration is due to a predicted flow of around 12,000 - 13,000 AADT with a speed of approximately 65 km/h on this section of the Didcot to Culham River Crossing.*”

This statement fails to recognise the particular circumstances of the traffic flow on the HIF1 road at the closest position to Appleford, and under-estimates the resultant NO₂ concentration.

- The road is elevated above the roof level of dwellings that lie downwind and within 60-70m of the road. This will result in a widespread distribution of the emissions from the road. The uninterrupted spread of emissions from the road at this distance is not specifically recognized in the modelling.
- The HIF1 road is at a gradient at both approaches to the road bridge over Appleford Rail Sidings. The changes of gear and engine speed, particularly for loaded HGVs will result in an increase in emissions. This is not specifically recognized in the modelling.

Response to 2.10:

The HIF1 road was modelled at ground level with receptors modelled at breathing height (1.5m) with no gradient. This is a standard practice in highways assessments and provides a worst case assessment. Gradients greater than 2.5% can influence HDV emissions, although increases uphill are general balanced by reductions downhill.

2.11 [HIF1 ES Chapter 6 Air Quality paragraph 6.8.5] states the objective of reducing emissions on the A4130 between Milton Interchange and Didcot will be achieved by reducing congestion, slow moving and idling traffic. This is inaccurate. The net result, on this stretch of road, will be an overall growth in the amount of traffic, attracted from the A34 by the HIF new route to east Oxford and the M40. The document recognises this, as it is stated that the HIF will relieve congestion on the A34 (and by implication, on the Oxford Ring Road). Overall emissions on this part of the A4130 will rise, not fall. Moreover, much higher levels of emissions will now be generated close to settlements, not currently experiencing high flows of passing traffic, e.g. the parishes of Appleford, Sutton Courtenay, Culham, Clifton Hampden, Nuneham Courtenay and Long Wittenham.

Response to 2.11:

The future flows show modest increases in annual average daily traffic flow on the A4130 between Milton interchange and the new Science Bridge Link roundabout. To the east of the new roundabout the flows on the A4130 reduce significantly (see Table 16.14 of the traffic & transport chapter). The air quality assessment predicted that there would be improvements in air quality at sensitive receptors as a result of a reduction in traffic flow and congestion through villages including Clifton Hampden, Sutton Courtenay, Long Wittenham as well as in Appleford.

3.0 Conclusion

The concluding statement in para 6.10.17 of ES Chapter 6 : “*Therefore, a conclusion of no likely significant air quality effects for human health is recorded*” is in error. For communities that will be close to the proposed road alignment there will be serious health implications. Not only will the pollution levels for NO₂ and PM_{2.5} clearly exceed current WHO guidelines, proper measurement and analysis of the actual circumstances of the dwellings close to the road is likely to show that the concentrations will exceed even the more harmful thresholds taken as acceptable for the study.

The NPPF National Planning policy framework States “*planning Policies and decisions should aim to achieve healthy inclusive and safe places.*” The Environmental Impact Analysis fails to demonstrate that the HIF1 proposal will meet this objective.

The lack of investigation of alternative alignments for the HIF1 road indicates that the current planning application is not based on analyses to minimize pollution and emissions at existing communities adjacent to the proposed road. This planning application should therefore be rejected.

Response to 3.0

The air quality assessment predicted that NO₂ and PM₁₀ (and therefore PM_{2.5}) do not exceed the air quality objective values in the 2019 baseline year or opening year and there was no risk of non-compliance with the EU Limit Values. Following the DMRB guidance, a conclusion of no significant air quality effects due to the scheme can therefore be made. Therefore, scheme air quality is consistent with relevant planning policy.

Appendix A Modelling Sensitivity Tests

Elevation of HIF1 Road

The results of the test to model the HIF1 road at an elevation between 5m and 10m above the existing road are given in Table 1. These results show that the modelled NO₂ concentrations at receptors in Appleford would be the same (to 1 decimal place) or slightly lower in the Do Something scenario (DS) if the new road had been modelled at height. In both instances the concentrations predicted are well within the air quality objective for NO₂.

Table 1: Predicted NO₂ concentrations for road elevation sensitivity test

Receptor ID	X	Y	Modelled NO ₂ concentration (µg/m ³)		
			ES DS (with HIF Scheme)	DS Elevation Sensitivity Test	Change in DS with Sensitivity Test
R23	452440	192812	14.7	14.5	-0.2
R24	452574	193232	13.9	13.9	<0.1
R25	452617	193693	14.4	14.4	<0.1
R26	452648	193566	13.5	13.5	<0.1
R27	452382	193721	13.0	12.9	<0.1
R54	452480	192878	14.2	14.0	-0.2
R57	451162	194340	14.5	14.5	<0.1
R65	452450	192816	14.3	14.1	-0.2
R66	452502	192951	14.1	13.9	-0.2
R67	452480	192950	13.7	13.5	-0.3
R68	452550	193214	12.9	12.9	-0.1
R69	452609	193366	14.4	14.4	<0.1
R74	452495	192883	14.9	14.8	-0.2
R76	452516	193082	13.1	13.0	-0.1
R77	452516	193488	12.2	12.1	<0.1
R90	452664	193482	12.9	12.9	<0.1
R99	452516	193082	13.1	13.0	-0.1
R100	452536	193086	13.8	13.7	-0.1
R107	452657	193633	13.4	13.4	<0.1
R116	452399	193722	13.0	13.0	<0.1
R117	452510	193296	12.4	12.3	-0.1
ND-1617A*	451201	194336	16.0	16.0	<0.1

*New development receptor

HGV Restriction on Main Road

The extent of the existing HGV restriction along the B4016 Main Road, Appleford is indicated in Figure 1.

Based on traffic count data used to validate the Paramics traffic model, there is evidence that HGVs still travel along the road, which meant that there were around 100 HGVs assumed across a 24h period in the Do Minimum (DM) scenario (i.e. without the HIF scheme) reported in the ES. A sensitivity modelling test was conducted to consider the impact if the HGV restriction was enforced in the DM scenarios. To do this, the same number of HGVs as in the Do Something (DS) scenario was assumed for the DM scenario. The results of this sensitivity test are given in Table 2.

Figure 1: HGV Restrictions on B4016 in Appleford



File Name: Y:\Projects\Didcot Garden Town Scheme\A01 Modelling\Appleford\H101\map2\OS Data\HGV_restr.mxd

Table 2: Predicted NO₂ concentrations for HGV restriction sensitivity test

Receptor ID	X	Y	Modelled NO ₂ concentration and change (µg/m ³)				
			ES DM without scheme	DM with HGV Restriction Sensitivity Test	ES DS	Change ES DS-DM	Change DS- DM with HGV Restriction Sensitivity Test
R23	452440	192812	12.7	12.7	14.7	2.0	2.0
R24	452574	193232	15.8	15.6	13.9	-1.9	-1.7
R25	452617	193693	16.8	16.5	14.4	-2.4	-2.1
R26	452648	193566	15.4	15.2	13.5	-1.9	-1.7
R27	452382	193721	13.6	13.6	13.0	-0.6	-0.6
R54	452480	192878	14.1	14.0	14.2	0.1	0.2
R57	451162	194340	14.3	14.3	14.5	0.2	0.2
R65	452450	192816	12.8	12.8	14.3	1.5	1.5
R66	452502	192951	14.6	14.5	14.1	-0.5	-0.4
R67	452480	192950	13.4	13.3	13.7	0.3	0.4
R68	452550	193214	13.6	13.5	12.9	-0.7	-0.6
R69	452609	193366	17.1	16.8	14.4	-2.8	-2.5
R74	452495	192883	16.1	15.9	14.9	-1.2	-1.0
R76	452516	193082	13.5	13.4	13.1	-0.4	-0.3
R77	452516	193488	12.2	12.1	12.2	<0.1	<0.1
R90	452664	193482	14.0	13.9	12.9	-1.1	-1.0
R99	452516	193082	13.5	13.4	13.1	-0.4	-0.3
R100	452536	193086	15.1	14.9	13.8	-1.3	-1.1
R107	452657	193633	15.2	15.0	13.4	-1.7	-1.5
R116	452399	193722	13.8	13.7	13.0	-0.7	-0.7
R117	452510	193296	12.4	12.3	12.4	<0.1	<0.1
ND-1617A	451201	194336	15.4	15.4	16.0	0.6	0.6

The results from the HGV restriction sensitivity test show that predicted annual mean NO₂ concentrations in the DM would be the same or slightly lower than the ES DM results. This is due to a reduction in the number of HGVs on the road which results in a reduction in overall traffic flow (by approx. 100 vehicles) from the roads where the HGV restriction applies. There is no change to the results with the scheme in place, but there is a slightly lower benefit due to the scheme as the predicted reduction in HGVs as presented in the ES would not be seen. In both the ES and the HGV restriction sensitivity test the concentrations predicted are well within the air quality objective for NO₂. This means that that the benefits of the scheme are not significant in this HGV restriction sensitivity test or the scheme ES.



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Project name:
Didcot Garden Town Schemes

Project ref: 60606782

From:
AECOM

Date:
27th October 2022

**To: Oxfordshire County Council (OCC)
Local Planning Authority**

Memo

Subject: Appleford Parish Council - Air Quality Comments Response

This note provides AECOM's response to the comments dated 7th February 2022 from Appleford Parish Council relating to the Air Quality Assessment for Planning Application R3.0138/21, HIF1 road between A34 Milton Interchange and B4015 north of Clifton Hampden.

AECOM's responses are provided in blue text below each point and relate to the Air Quality Chapter 6 and Population and Health Chapter 13 of the Environmental Statement (ES) volume 1, with reference to the scheme's Transport Assessment.

1.0 Basis for Refusal

The application for the development of the HIF1 road should be refused planning permission for the following reasons.

The proposal fails to comply with the following parts of Local and County Plans:

1.1 South Oxfordshire District Council

SOLP – Policy EP1 Air Quality; In so far as the Air Quality Assessment for this significant development is inadequate and fails to account for cumulative impact in the sector, Didcot to River Crossing.

SOLP – Policy ENV12 Pollution – (Impact of Development on Human Health, the Natural Environment and/or Local Amenity (Potential Sources of Pollution)); The development will result in significant cumulative impact on health and amenity in the sector Didcot to River Crossing.

Response to 1.1:

The air quality assessment includes the cumulative impacts of committed schemes within the study area as the impact of these on traffic flows are included within the modelled traffic data which was used as the basis to model the HIF1 scheme. The air quality impacts of the scheme are not significant and as such the scheme is in line with relevant planning policy.

1.2 Vale of White Horse District Council

VoWHLP – Development Policy 23: Impact of Development on Amenity. In so far as the development will result in significant adverse cumulative -impacts on Appleford Village in respect of visual intrusion, noise, emissions and road lighting .

VoWHLP – Development Policy 26 Air Quality. The Air Quality Assessment for this development is inadequate and has not demonstrated that it has been design to minimise the impact on air quality in the adjacent community of Appleford.

Response to 1.2:

The air quality assessment of the scheme concluded that there will be no exceedances of the air quality objectives and no significant impacts are reported. Therefore, there is no requirement to put in place any scheme specific mitigation to improve air quality.

1.3 Health Impact Assessments

District Council policies identify the need for Health Impact Assessments (HIA) to be conducted for all strategic developments to determine how the development will improve health and wellbeing.

OCC , LTCP 2021 policy 12 states : 12 – *Oxfordshire County Council will require transport plans and infrastructure schemes to deliver health benefits and to mitigate any negative impacts by:*

a. Requiring all major schemes or plans where potential health issues are likely to arise, to screen for possible health and wellbeing impacts.

b. Requiring a Rapid or Full HIA to be submitted for larger-scale infrastructure proposals.”

The HIF1 scheme has not been subject to a Health Impact Assessment (HIA) as required in District Council policies, LTCP 2021 and as suggested by Oxfordshire’s Director of Public Health.

The proposal is not based on analyses to minimize pollution and emissions at existing communities adjacent to the proposed road, to be demonstrated through an HIA.

Response to 1.3:

The Oxfordshire Local Transport and Connectivity Plan was adopted in July 2022. Whilst a specific HIA was not conducted, Chapter 13: Population and Human Health of the ES has followed Design Manual for Roads and Bridges (DMRB) guidance to consider air quality, noise and visual impacts on the human health of nearby sensitive receptors, such as residents. This chapter has considered numerous health determinants such as average life expectancy, average wealth and deprivation as well as data on hospital admissions for lung diseases and deaths from respiratory diseases within the study area.

2.0 Environmental Statement Chapter 6, Air Quality

This document (Didcot HIF1 ES Chapter 6 Air Quality) submitted to accompany the application contains inaccuracies and limitations that renders it unreliable to assess the impact of the proposal on public health for reasons as explained below.

2.1 Section 6.2 makes no reference to the air pollution guidelines produced by the World Health Organisation (WHO).

In their response to this planning application, the UK Health Security Agency has advised OCC that :

“Reducing public exposures to non-threshold pollutants (such as particulate matter and nitrogen dioxide) below air quality standards has potential public health benefits. UKHSA support approaches which minimise or mitigate public exposure to non-threshold air pollutants.”

Recently updated WHO guidelines (2021) are based on the evidence that toxic particles and gases harm human health at much lower concentrations than previously thought. Current WHO guidelines for annual emissions limits pollutant concentrations to 5 µg/m³ for particulates PM_{2.5} and 10 µg/m³ for nitrogen dioxide NO₂. It is now recognised that UK legislation is no longer adequate to assess the impact of new road proposals. The permitted emissions assumed in the HIF1 Air Quality Assessment exceed the current WHO guidelines by 500% for PM_{2.5} and 400% for NO₂. Whilst there are difficulties in reducing current emissions for

existing roads there are no such difficulties in assessing a new road proposal in an area where existing emission are low. The highest standard for AQ needs to be adopted for new sections of the HIF1 road. Appleford village is one community lying closest to a new section of the proposed road. It is reasonable to position the road in relation to Appleford to ensure that the road does not, in itself, create toxic emissions in excess of the WHO guidelines. If more punishing level of emissions are to be considered to facilitate the road, this must be through consultation and agreement with the communities that will be affected. OCC undertook no consultation with affected Parish Councils and residents of parishes like Appleford to agree emission standards to assess the road proposal.

Response to 2.1:

The air quality assessment has followed the methodology and guidance set out in the Design Manual for Roads and Bridges (DMRB) LA 105 Air Quality¹ guidance document for highways schemes as outlined in the scheme scoping report.

The DMRB guidance sets out the requirements for assessing air quality in line with the EU Air Quality Directive² and whether there is a risk of the scheme's impacts will affect the UK's reported ability to comply with the directive. The assessment has therefore taken into account the current UK air quality objectives as set out in the legislation and the EU limit values in the Directive. The results of the assessment show that predicted NO₂ and PM₁₀ concentrations are below the annual mean and short-term air quality objectives as set out in the UK legislation.

Published 2019 annual mean background pollutant concentrations range from 12.4- 12.7 µg/m³ for NO₂, 15.7-15.8 µg/m³ for PM₁₀ and 9.7 µg/m³ for PM_{2.5} around Appleford. These concentrations are well below the annual mean air quality objectives of 40 µg/m³ for NO₂ and PM₁₀ and 25 µg/m³ for PM_{2.5} and below the 2005 WHO air quality guidelines³ of 20 µg/m³ and 10 µg/m³ for PM₁₀ and PM_{2.5} respectively. The WHO guidelines are aimed at informing legislation and policy but are not legally binding in the UK which means there is no requirement to assess pollutants against these guideline levels.

Since the publication of the ES, the WHO guidelines have been tightened and more stringent targets for PM_{2.5} are likely to be set under the Environment Act 2021⁴. However, no new targets in UK legislation have been set nor any consultation started on what thresholds the government may adopt in the future.

OCC has undertaken consultation on the scheme. The HIF1 Scoping Opinion Report which set out the methodology for the air quality assessment was sent to all statutory consultees, including the Parish Council. Comments were received back from the district councils and other Parish Councils, but not Appleford Parish Council. OCC has also had a number of meetings with the Parish Council. For example, at the meeting 1st July 2021, OCC presented the baseline air quality survey data and emerging results from the air quality assessment for the draft ES.

2.2 In so far as the change to air quality, due to the proximity of the proposed HIF1 road close to communities like Appleford, has not been properly assessed, the road scheme does not follow the Planning Policy Guidance of the NPPF.

Response to 2.2:

The National Planning Practice Guidance has been followed for the assessment. Considerations have been given to potential trends in air quality in the presence and absence of development, as well as any impacts and mitigation / improvement opportunities arising from the scheme.

2.3 The document makes no attempt to model PM_{2.5} (as section 6.4.17 confirms). There is increasing awareness that smaller particulates have a critical effect on respiration. The Air Quality Analysis is therefore incomplete.

Response to 2.3:

¹ Highways England, Design Manual for Roads and Bridges, Sustainability & Environment Appraisal, LA 105: Air quality, 2019.

² DIRECTIVE 2008/50/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 21 May 2008 on ambient air quality and cleaner air for Europe.

³ WHO global air quality guidelines Global update 2005. https://www.euro.who.int/_data/assets/pdf_file/0005/78638/E90038.pdf

⁴ Environment Act 2021. <https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted>

The assessment has followed the DMRB LA 105 guidance for highways schemes. This document states the following in terms of PM_{2.5} modelling:

“2.21.4 There should be no need to model PM_{2.5} as the UK currently meets its legal requirements for the achievement of the PM_{2.5} air quality thresholds and the modelling of PM₁₀ can be used to demonstrate that the project does not impact on the PM_{2.5} air quality threshold.”

National Highways has not published any plans for the DMRB to include PM_{2.5} within its methodology.

As stated in the response to 2.1, background concentrations are well below current air quality objectives for PM₁₀ and PM_{2.5}. The air quality assessment has followed the DMRB guidance and has predicted PM₁₀ concentrations at selected receptors in a baseline year and future opening year with and without the HIF1 scheme. Levels are predicted to be below the UK air quality objective of 40µg/m³, with a maximum concentration of at selected receptors of 18.8 µg/m³ in the 2019 baseline year across the study area and a maximum of 16.7 µg/m³ within the Appleford area. Concentrations in the future year with and without the scheme are predicted to decline compared to the baseline. As PM_{2.5} is a component of PM₁₀, predicted concentrations will be lower than this, and therefore will be well below the PM_{2.5} air quality objective value of 25 µg/m³.

2.4 There have been no adequate measurements of the current levels of NO₂ and PM_{2.5} at property boundaries for critical areas in Appleford. A single roadside measurement at a junction of the village Main Road and Church Street (table 6.10 location RIV3) indicated an annual NO₂ mean of 25.5 µg/m³. Unfeasibly this appears to exceed all roadside values measured at the busy A4130 between the A34 and Didcot. This single measurement, possibly in error, cannot be relied upon to characterise the current air quality in Appleford. The Air Quality Assessment has no reliable basis to predict the change to Appleford's air quality

2.5 With insufficient local air quality monitored data for Appleford, the air quality dispersion model, as described in paragraph 6.4.25) cannot be calibrated to real data. The output from the dispersion model for Appleford is therefore unreliable.

Response to 2.4 and 2.5:

Monitoring of NO₂ was carried out at 27 locations near the HIF1 scheme for a period of 6 months, using triplicate tubes. Along with RIV3, there were 3 other monitoring locations within 1km of Appleford Village (RIV2, RIV4 and RIV5). These data were used to supplement the existing local authority monitoring data to verify the performance of the air quality model. It is highly unusual to do any baseline monitoring of PM_{2.5} for highways schemes, especially in rural areas with low pollutant concentrations. Vale of White Horse District Council do not currently monitor levels of particulates within their district.

A thorough review of the performance of the air quality model at each of the monitoring sites was conducted to analyse the reasons for under and over predictions at the monitoring sites and to determine whether a more zonal verification was appropriate. The model performance was found to vary across the network. The model was found to perform particularly well along the A4130 dual carriageway. Apart from this section of the road network, there were no other individual areas where it was judged appropriate to put into a separate verification zone. Therefore, the verification and adjustment process was applied to two separate domains. The first deals with the majority of the road network, (zone A which includes Appleford and RIV3) and the second (zone B) deals with the conditions along the A4130 dual carriageway alone.

2.6 Contrary to paragraph 6.4.28, as there is insufficient local air quality monitored data for Appleford, existing pollutant concentrations from specific local activities have not been included in the assessment, e.g. rail aggregate handling at Appleford Sidings, asphalt works at Appleford Sidings, landfill and HGV movements immediately south west and upwind from Appleford.

Response to 2.6:

Background concentrations were combined with the model outputs to obtain total pollutant concentration at receptors. The background concentrations (published by Defra and the Devolved Administrations) provide an estimated breakdown of the relative sources of pollution. These include emissions from various sectors, including industrial emissions (combustion in industry, energy production, extraction of fossil fuel and waste) and rail emissions. No site specific information was available to include the above mentioned activities explicitly in the air quality model so their estimated emissions were included within the background concentration as part of the model predictions. HGV movements to the industrial processes south of Appleford are captured within the traffic and air quality model.

In addition, the monitoring data will be influenced by emissions from other sources as well as road traffic. These data were used to verify the performance of the air quality model and so will have been captured in the assessment.

2.7 The modelled pollutant concentrations at “public exposure receptors” along Main Road in Appleford, (locations R107, R26, R90, R69, R24, R100, R66, R74, in table 2 of ES vol III Appendix 6.2) are not based on credible traffic flows. Restrictions on HGV will continue to apply through Appleford village. Speed restrictions will apply and be tightened with or without the HIF road. The modelled reduction in NO₂ along Main Road due to the HIF is not credible. The only location of monitored real data, (location R107, matched to location RIV3), shows modelled values from the road well below the present measured value. The contribution from HIF1 and also local road traffic on top of other sources of pollution is not explored or explained.

Response to 2.7:

The air quality assessment has used modelled data from the Paramics transport model which is used for the transport assessment. The model is based on traffic count data conducted in 2017 to verify the baseline situation and forecast to future years. The traffic model predicts that there will be a significant reduction in traffic flow along Appleford Main Road with the scheme in place. As a result, there are improvements in air quality predicted at properties situated close to Main Road.

Modelled NO₂ concentrations at Receptor R107 are lower than those measured at RIV3. This is because site RIV3 is a kerbside location (approx. 0.8m from the kerb) and R107 is located further back from the road on the façade of the building (approx. 6m from the kerbside). The levels of pollutant concentrations drop significantly with increasing distance from the road which is why concentrations are lower at the property façade.

2.8 THE HIF1 Planning statement, para 7.11.2 asserts that “*the Site is not considered particularly sensitive in terms of air quality*”. And “*there will be no exceedance of the objective for annual mean NO₂* “. [HIF ES Chapter 6 Air Quality, section 6.9] confirms “that no specific, essential or enhanced air quality mitigation measures have been incorporated into the Scheme design.” And “*no monitoring of significant effects is proposed*” para 6.11.2

There is no justification for these statements moreover they conflict with the following statement.

[HIF1 ES Chapter 6 Air Quality] states “. *Higher traffic flows and average speeds are expected on the new proposed roads and bridges when compared (to) a do minimum situation without these roads. This could lead to higher emissions and higher annual mean concentrations of NO₂, NO_x, and PM₁₀ at sensitive receptors close to these new roads in the opening year with the Scheme when compared to the opening year without the Scheme.*”

Due to extensive errors and omissions in the Air Quality Assessment the true magnitudes of the resulting emissions in communities close to the proposed road have not been established and are likely to be under reported.

Response to 2.8:

The Parish Council’s first paragraph relating to para 7.11.2 in the ES refers to the fact that air quality levels are well below the objective values and are therefore considered to be good. This statement relates to the impact of the Scheme after the detailed modelling was conducted. Therefore, no mitigation is required as per the conclusions of the assessment. The air quality assessment was conducted in line with the DMRB Guidance using the available traffic data and has been peer reviewed and accepted by Oxfordshire County Council and Vale of White Horse and South Oxfordshire District Councils. Therefore, we do not accept that there are errors and omissions in the assessment.

The Parish Council’s second paragraph is taken from Section 6.8 ‘Potential Impacts’ of the report. This section is written prior to conducting the modelling to provide a general overview of the objective of the scheme and the potential to affect air quality.

2.8 [HIF1 ES Chapter 6 Air Quality. Para 6.10.16] refers to modelled levels of NO₂ and states “*The largest increase in annual mean NO₂ concentration is predicted at a residential property north of Hall Farm (R75, Appleford). With the Scheme in operation, the annual mean NO₂ concentration predicted at this receptor in the Scheme opening year is 16.0µg/m³, an increase of 3.3µg/m³ from 12.7µg/m³*”. This statement is likely to

be the nearest reflection of the effect of the HIF road on the dwellings along Main Road in Appleford. However this assessment fails to include existing emissions from the adjacent industrial activities around Appleford sidings. Moreover, the modelling is for a ground level road, at this location. Pollutants will distribute more widely from the proposed elevated HIF road which will be above roof level as it passes Appleford dwellings. The total pollution load and extend of distribution is likely to be well in excess of these figures.

Response to 2.8:

The annual mean concentrations presented in report includes background concentration which take into account the contribution from emissions from various sectors such as industrial processes (see response to point 2.6).

The new HIF road was modelled at ground level which is a worst case assessment to assess the impacts at sensitive receptors at breathing height (1.5m) than if the road was modelled at an elevated level (between 5m and 10m). If this elevation had been modelled for the ES, emissions would be released at a height above the nearest properties, which would have a lower impact at those properties nearest to the HIF1 road, due to greater dispersion and reduction in pollutant concentrations. The results of a sensitivity test to model elevation are given in Table 1 in Appendix A to demonstrate that the scheme ES has presented a worse case.

2.9 [HIF1 ES Appendix 6.2 Local Air Quality Assessment Results] states at paragraph 1.2.12 *“Along the Didcot to Culham River Crossing on the east side there are 12 receptors (R24, R25, R26, R27, R66, R68, R69, R74, R90, R100, R107 and R116) in Appleford which are predicted to experience decreases in annual mean NO₂ concentrations of 0.5µg/m³ to 2.8µg/m³ resulting in predicted concentrations of 12.9µg/m³ to 14.9µg/m³. This improvement is due to a predicted reduction of approximately 4,000 AADT on Main Road through Appleford.”*

This statement does not represent the actuality of the relationship between traffic on Main Road, Appleford and traffic on the proposed HIF1 road adjacent to Appleford. Main Road has weight restrictions prohibiting HGV traffic now and in the future. Traffic calming measures or vehicle restriction for commuter cars on Main Road must be in place if there is a future traffic growth, either due to the HIF1 road or other road scenarios. There should be no substantial increase in traffic on Main Road (B4016) for future scenarios. The Air Quality Assessment is therefore in error. The HIF1 road will not create a reduction in NO₂ concentrations through Appleford village. However, the siting of HIF1 as an arterial road, will bring many HGVs within 60m of dwellings in Appleford. This is unprecedented and poses a substantial increase in all forms of traffic emissions close to Appleford, which is not represented in the Air Quality Assessment.

Response to 2.9:

The air quality assessment has used traffic data from the transport assessment. The traffic model data has been provided with and without the scheme. As noted in response 2.7, the traffic model for the HIF1 scheme predicts that there will be a reduction in traffic flows through Appleford Main Road with the scheme in place, and in particular there is a substantial reduction in the numbers of HGV on this road as these vehicles will use the HIF1 road. The air quality model has taken into account the emissions from both of these roads. Due to the distance of the HIF1 road from many of the residential properties in Appleford and the fact that emissions drop off quickly from the road, the reduction in traffic flow along Main Road is the primary reason for the reduction in air quality predicted at many properties located close to Main Road.

A sensitivity test was carried out to assume that the HGV restriction is enforced in Appleford. For the Do Minimum scenario, this would mean that there are fewer vehicles travelling along the B4016 where the restrictions apply. The results of this sensitivity test are given in Table 2 in Appendix A. There is no change to the results with the scheme in place, but there is a slightly lower benefit due to the scheme as the predicted reduction in HGVs as presented in the ES would not be seen. In both the ES and the HGV restriction sensitivity test the concentrations predicted are well within the air quality objective for NO₂. This means that that the benefits of the scheme are not significant in this HGV restriction sensitivity test or the scheme ES.

2.10 [HIF1 ES Appendix 6.2 Local Air Quality Assessment Results] states at paragraph 1.2.13 *“There are three receptors (R23, R65 and R75) close to the new road which are predicted to experience increases in annual mean NO₂ concentrations of 1.5µg/m³ to 3.3µg/m³ resulting in predicted concentrations of 14.3µg/m³ to 16.0µg/m³. This deterioration is due to a predicted flow of around 12,000 - 13,000 AADT with a speed of approximately 65 km/h on this section of the Didcot to Culham River Crossing.”*

This statement fails to recognise the particular circumstances of the traffic flow on the HIF1 road at the closest position to Appleford, and under-estimates the resultant NO₂ concentration.

- The road is elevated above the roof level of dwellings that lie downwind and within 60-70m of the road. This will result in a widespread distribution of the emissions from the road. The uninterrupted spread of emissions from the road at this distance is not specifically recognized in the modelling.
- The HIF1 road is at a gradient at both approaches to the road bridge over Appleford Rail Sidings. The changes of gear and engine speed, particularly for loaded HGVs will result in an increase in emissions. This is not specifically recognized in the modelling.

Response to 2.10:

The HIF1 road was modelled at ground level with receptors modelled at breathing height (1.5m) with no gradient. This is a standard practice in highways assessments and provides a worst case assessment. Gradients greater than 2.5% can influence HDV emissions, although increases uphill are general balanced by reductions downhill.

2.11 [HIF1 ES Chapter 6 Air Quality paragraph 6.8.5] states the objective of reducing emissions on the A4130 between Milton Interchange and Didcot will be achieved by reducing congestion, slow moving and idling traffic. This is inaccurate. The net result, on this stretch of road, will be an overall growth in the amount of traffic, attracted from the A34 by the HIF new route to east Oxford and the M40. The document recognises this, as it is stated that the HIF will relieve congestion on the A34 (and by implication, on the Oxford Ring Road). Overall emissions on this part of the A4130 will rise, not fall. Moreover, much higher levels of emissions will now be generated close to settlements, not currently experiencing high flows of passing traffic, e.g. the parishes of Appleford, Sutton Courtenay, Culham, Clifton Hampden, Nuneham Courtenay and Long Wittenham.

Response to 2.11:

The future flows show modest increases in annual average daily traffic flow on the A4130 between Milton interchange and the new Science Bridge Link roundabout. To the east of the new roundabout the flows on the A4130 reduce significantly (see Table 16.14 of the traffic & transport chapter). The air quality assessment predicted that there would be improvements in air quality at sensitive receptors as a result of a reduction in traffic flow and congestion through villages including Clifton Hampden, Sutton Courtenay, Long Wittenham as well as in Appleford.

3.0 Conclusion

The concluding statement in para 6.10.17 of ES Chapter 6 : *“Therefore, a conclusion of no likely significant air quality effects for human health is recorded”* is in error. For communities that will be close to the proposed road alignment there will be serious health implications. Not only will the pollution levels for NO₂ and PM_{2.5} clearly exceed current WHO guidelines, proper measurement and analysis of the actual circumstances of the dwellings close to the road is likely to show that the concentrations will exceed even the more harmful thresholds taken as acceptable for the study.

The NPPF National Planning policy framework States *“planning Policies and decisions should aim to achieve healthy inclusive and safe places.”* The Environmental Impact Analysis fails to demonstrate that the HIF1 proposal will meet this objective.

The lack of investigation of alternative alignments for the HIF1 road indicates that the current planning application is not based on analyses to minimize pollution and emissions at existing communities adjacent to the proposed road. This planning application should therefore be rejected.

Response to 3.0

The air quality assessment predicted that NO₂ and PM₁₀ (and therefore PM_{2.5}) do not exceed the air quality objective values in the 2019 baseline year or opening year and there was no risk of non-compliance with the EU Limit Values. Following the DMRB guidance, a conclusion of no significant air quality effects due to the scheme can therefore be made. Therefore, scheme air quality is consistent with relevant planning policy.

Appendix A Modelling Sensitivity Tests

Elevation of HIF1 Road

The results of the test to model the HIF1 road at an elevation between 5m and 10m above the existing road are given in Table 1. These results show that the modelled NO₂ concentrations at receptors in Appleford would be the same (to 1 decimal place) or slightly lower in the Do Something scenario (DS) if the new road had been modelled at height. In both instances the concentrations predicted are well within the air quality objective for NO₂.

Table 1: Predicted NO₂ concentrations for road elevation sensitivity test

Receptor ID	X	Y	Modelled NO ₂ concentration (µg/m ³)		
			ES DS (with HIF Scheme)	DS Elevation Sensitivity Test	Change in DS with Sensitivity Test
R23	452440	192812	14.7	14.5	-0.2
R24	452574	193232	13.9	13.9	<0.1
R25	452617	193693	14.4	14.4	<0.1
R26	452648	193566	13.5	13.5	<0.1
R27	452382	193721	13.0	12.9	<0.1
R54	452480	192878	14.2	14.0	-0.2
R57	451162	194340	14.5	14.5	<0.1
R65	452450	192816	14.3	14.1	-0.2
R66	452502	192951	14.1	13.9	-0.2
R67	452480	192950	13.7	13.5	-0.3
R68	452550	193214	12.9	12.9	-0.1
R69	452609	193366	14.4	14.4	<0.1
R74	452495	192883	14.9	14.8	-0.2
R76	452516	193082	13.1	13.0	-0.1
R77	452516	193488	12.2	12.1	<0.1
R90	452664	193482	12.9	12.9	<0.1
R99	452516	193082	13.1	13.0	-0.1
R100	452536	193086	13.8	13.7	-0.1
R107	452657	193633	13.4	13.4	<0.1
R116	452399	193722	13.0	13.0	<0.1
R117	452510	193296	12.4	12.3	-0.1
ND-1617A*	451201	194336	16.0	16.0	<0.1

*New development receptor

HGV Restriction on Main Road

The extent of the existing HGV restriction along the B4016 Main Road, Appleford is indicated in Figure 1.

Based on traffic count data used to validate the Paramics traffic model, there is evidence that HGVs still travel along the road, which meant that there were around 100 HGVs assumed across a 24h period in the Do Minimum (DM) scenario (i.e. without the HIF scheme) reported in the ES. A sensitivity modelling test was conducted to consider the impact if the HGV restriction was enforced in the DM scenarios. To do this, the same number of HGVs as in the Do Something (DS) scenario was assumed for the DM scenario. The results of this sensitivity test are given in Table 2.

Table 2: Predicted NO₂ concentrations for HGV restriction sensitivity test

Receptor ID	X	Y	Modelled NO ₂ concentration and change (µg/m ³)				
			ES DM without scheme	DM with HGV Restriction Sensitivity Test	ES DS	Change ES DS-DM	Change DS- DM with HGV Restriction Sensitivity Test
R23	452440	192812	12.7	12.7	14.7	2.0	2.0
R24	452574	193232	15.8	15.6	13.9	-1.9	-1.7
R25	452617	193693	16.8	16.5	14.4	-2.4	-2.1
R26	452648	193566	15.4	15.2	13.5	-1.9	-1.7
R27	452382	193721	13.6	13.6	13.0	-0.6	-0.6
R54	452480	192878	14.1	14.0	14.2	0.1	0.2
R57	451162	194340	14.3	14.3	14.5	0.2	0.2
R65	452450	192816	12.8	12.8	14.3	1.5	1.5
R66	452502	192951	14.6	14.5	14.1	-0.5	-0.4
R67	452480	192950	13.4	13.3	13.7	0.3	0.4
R68	452550	193214	13.6	13.5	12.9	-0.7	-0.6
R69	452609	193366	17.1	16.8	14.4	-2.8	-2.5
R74	452495	192883	16.1	15.9	14.9	-1.2	-1.0
R76	452516	193082	13.5	13.4	13.1	-0.4	-0.3
R77	452516	193488	12.2	12.1	12.2	<0.1	<0.1
R90	452664	193482	14.0	13.9	12.9	-1.1	-1.0
R99	452516	193082	13.5	13.4	13.1	-0.4	-0.3
R100	452536	193086	15.1	14.9	13.8	-1.3	-1.1
R107	452657	193633	15.2	15.0	13.4	-1.7	-1.5
R116	452399	193722	13.8	13.7	13.0	-0.7	-0.7
R117	452510	193296	12.4	12.3	12.4	<0.1	<0.1
ND-1617A	451201	194336	15.4	15.4	16.0	0.6	0.6

The results from the HGV restriction sensitivity test show that predicted annual mean NO₂ concentrations in the DM would be the same or slightly lower than the ES DM results. This is due to a reduction in the number of HGVs on the road which results in a reduction in overall traffic flow (by approx. 100 vehicles) from the roads where the HGV restriction applies. There is no change to the results with the scheme in place, but there is a slightly lower benefit due to the scheme as the predicted reduction in HGVs as presented in the ES would not be seen. In both the ES and the HGV restriction sensitivity test the concentrations predicted are well within the air quality objective for NO₂. This means that that the benefits of the scheme are not significant in this HGV restriction sensitivity test or the scheme ES.