

The deterioration of Abingdon air quality due to the North Abingdon housing developments

in the Vale of the White Horse Local Plan



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*a topic report prepared
on behalf of*

The North Abingdon Local Plan Group



Abingdon AQMA



Dunmore Road 15th Dec 2014

The deterioration of Abingdon air quality due to the North Abingdon housing developments

Summary

1.1 We consider that the proposed Green Belt housing developments to the North of Abingdon-on-Thames will make the existing air pollution problems in the town centre worse. Dunmore Road and Twelve Arce Drive will no longer be able to function as a ring road, particularly for large HGV and articulated vehicles, leading to increased traffic through the town centre. General traffic congestion will be exacerbated by the regular accidents and closures of the A34 with no alternative route. These housing developments undermine the number one measure in the Vale’s “Air Quality Action Plan” to alleviate the town centre’s air pollution problem. Economic development and housing needs cannot knowingly degrade public health.

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2. Introduction

- 2.1 The Vale of White Horse has proposed a major housing development straddling the Abingdon peripheral route. This route was identified as the number one measure for reducing the high air pollution in Abingdon town centre and improving public health. The Vale knows that air pollution in the town centre is still above the government's health guidelines and the affected area is increasing.
- 2.2 Public Health England estimates that air pollution kills an additional 52 people in the Vale each year in the 25+ age group. Clearly, most deaths and the chronic health effects will be in the polluted town centres.
- 2.3 The Vale has ignored expert advice, which they commissioned, to extend the town centre Air Quality Management Area for another 60 residents. This should now include the vulnerable and infirm in the Abingdon Court Residential Care Home and Abingdon Community Hospital.
- 2.4 The recent remodelling of the Wootton Road roundabout demonstrates the disjointed co-ordination between the County Highways, Vale Planning and local councillors. A light controlled pedestrian crossing was added to improve safety for cyclists. However this reduced the number of traffic lanes onto the roundabout from two to one, leading to worse and severe congestion at peak times. Traffic flow was constricted along the route required in the Vale's Action Plan to alleviate air pollution in the town centre.
- 2.5 The Vale acknowledges that the Highways Agency (HA) will not welcome the improvements to the Lodge Hill junction. The HA do not want the A34 to be a north – south bypass for short journeys. Also, residents will not risk entrapment in the A34 jams and will therefore continue to traverse the polluted town centre.
- 2.6 There are accidents reported on the A34 every two days on average. The police often close the carriageways and force the A34 traffic through Abingdon. The dramatic influx causes a rise in the short-term pollution levels above Government's health standards.
- 2.7 The proposed housing development must be adequately and safely assimilated within Abingdon and must not be isolated by the surrounding major roads. This will necessitate many traffic measures (pedestrian crossings, roundabouts) which will further discourage use of the peripheral route particularly for large HGV and articulated vehicles. The inevitable consequence will be a knock-on impact on air pollution and public health affecting all residents of Abingdon.
- 2.8 The Vale cannot ignore the public health impact of the northern housing development on the already existing air pollution problem in Abingdon town centre.

3. Background

3.1 The Vale of White Horse has a statutory duty to periodically review and assess air quality. On 23rd August 2006, the Vale declared an Air Quality Management Area (AQMA) in Abingdon town centre for nitrogen dioxide (NO₂) pollution. The Botley AQMA will not be discussed further. In April 2009, an Action Plan¹ was published which identified measures to improve local air quality in the Abingdon AQMA.

3.2 Air quality is mentioned on page 10 of appendices to the Local Plan².

- Investigate potential noise and air pollution impacts from the A34, A4183, Dunmore Road & Twelve Acre drive and mitigate (if required) to offset any adverse impacts.
- Consider potential impact on Abingdon-on-Thames Air Quality Management Area (AQMA) and mitigate (if necessary).

3.3 Therefore, the impact of the proposed north Abingdon housing development on the existing Air Quality Management Area (AQMA) in Abingdon town centre must be considered and mitigated, if necessary.

4. Air Quality Review and Assessment

4.1 The Air Quality Strategy for England, Scotland, Wales and Northern Ireland (Defra, 2007)³ sets out a framework for air quality management, which includes a number of air quality objectives. National and international measures are expected to achieve these objectives in most locations, but where areas of poor air quality remain, air quality management at a local scale has a particularly important role to play. Part IV of the Environment Act 1995⁴ requires local authorities to periodically review and assess air quality in their areas. The role of this process is to identify areas where it is unlikely that the air quality objectives will be achieved. These locations must be designated as AQMAs and a subsequent Air Quality Action Plan (AQAP) developed in order to reduce pollutant emissions in pursuit of the objectives.

4.2 The air quality objectives for the pollutants are available on http://uk-air.defra.gov.uk/assets/documents/National_air_quality_objectives.pdf. These are shown in the table below specifically for nitrogen dioxide NO₂. There is a short term (1 hour) objective for acute health effects and a long term (annual mean) for chronic health effects.

Table 2

National air quality objectives and European Directive limit and target values for the protection of human health							
Pollutant	Applies	Objective	Concentration measured as ¹⁰	Date to be achieved by and maintained thereafter	European obligations	Date to be achieved by and maintained thereafter	New or existing
Nitrogen dioxide	UK	200µg.m ⁻³ not to be exceeded more than 18 times a year	1 hour mean	31 December 2005	200µg.m ⁻³ not to be exceeded more than 18 times a year	1 January 2010	Retain existing
	UK	40µg.m ⁻³	annual mean	31 December 2005	40µg.m ⁻³	1 January 2010	

4.3 The Policy Guidance⁵ for the Environment Act has the following requirement.

Format of the Action Plan

4.9 The Action Plan itself should take a practical approach towards focussing on what really matters – detailing measures to improve air quality and quantifying, as far as possible, their impact over time.

4.4 Therefore, the Vale is required to focus on what really matters and detail measures to improve air quality.

4.5 Extracts from the various air quality reports and relevant events are shown in the table below. These are listed in chronological order for clarity. All reports are available on the Vale website

<http://www.whitehorsedc.gov.uk/services-and-advice/environment/pollution/air-quality>

July 2003 Updating and Screening Assessment (USA)

Objectives for all seven pollutants would be achieved at relevant locations across the local authority. These findings were based on the assumption that the Abingdon Town Centre traffic management scheme would be in place by 2005.

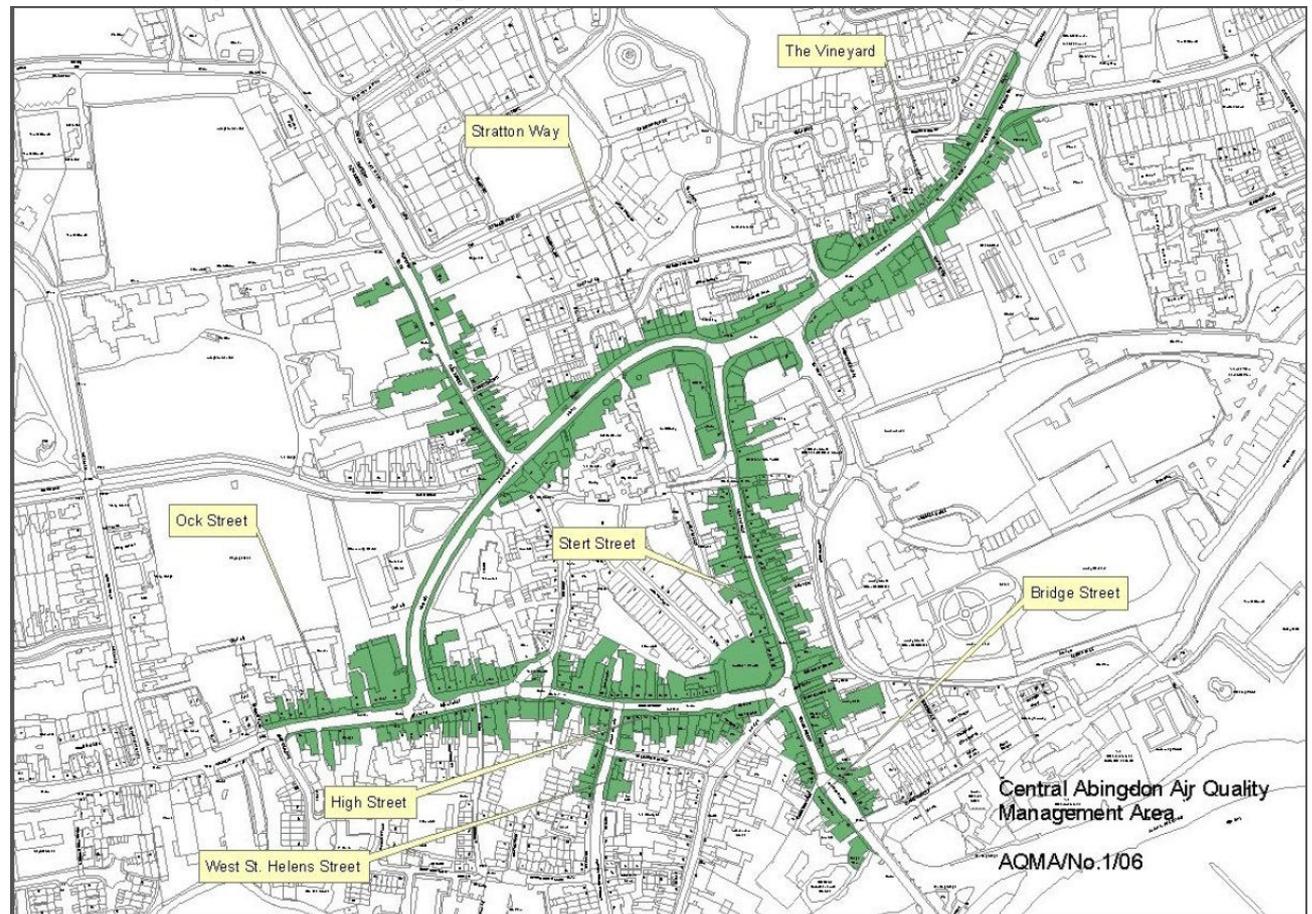
2004 Progress Report

Recommended by Defra to proceed to a Detailed Assessment for the area along Stert Street in Abingdon for nitrogen dioxide. Monitoring data suggested a risk of the annual mean nitrogen dioxide objective not being met.

Feb 2006 Detailed assessment of air quality in Abingdon 2006

This detailed assessment has identified a significant risk of exceedance of the UK objectives for NO₂ in 2005 and the EU Limit values for NO₂ in 2010 in Vale of White Horse District at the locations in Abingdon studied in this detailed assessment.

23rd August 2006 the Vale declared an Air Quality Management Area (AQMA) in Abingdon Town Centre for nitrogen dioxide (NO₂) pollution. The area is shown below.



2008 Further assessment of air quality in Abingdon AQMA - May 2008

1.7 The air quality objectives only apply where members of the public are likely to be regularly present for the averaging time of the objective (i.e. where people will be exposed to pollutants). For annual mean objectives, relevant exposure is limited to residential properties, schools and hospitals. The 1-hour objective applies at these locations, as well as at any outdoor location where a member of the public might reasonably be expected to stay for 1 hour or more, such as shopping streets, parks and sports grounds, as well as bus stations and railway stations that are not fully enclosed.

8.1 The results indicate that the annual mean nitrogen dioxide objective was exceeded in 2007 within the AQMA, and also at locations outside of the AQMA along Ock Street.

8.2 It is therefore recommended that the Abingdon AQMA should be extended to include all relevant exposure along Ock Street.

[This report recommends the extension of the AQMA.](#)

2008 Introduction of the Abingdon Integrated Traffic Strategy (Abits)

April 2009 Air Quality Action Plan: Technical Report

4.14 Encourage more traffic on the peripheral road. Encouraging traffic onto the peripheral road may reduce traffic travelling through central Abingdon and therefore reduce emissions. It is considered that this would be feasible through improved signage around Abingdon and could be implemented in conjunction with HGV weight restrictions.

This proposal has been included in the Action Plan.

April 2009 Air Quality Action Plan

Summary

Air quality monitoring has identified high levels of nitrogen dioxide in the centre of Abingdon. Because the levels exceed the Government's national target for nitrogen dioxide, the District Council has declared part of the centre of the town an Air Quality Management Area.

This Air Quality Action Plan identifies measures to improve local air quality in the Air Quality Management Area. Measures are set out under the following headings:-

- Traffic management
- Lowering emissions
- Promotion of alternatives
- Planning
- Education and information

Most of the town centre traffic flow management improvements resulting from the Abingdon Integrated Transport Strategy have now been implemented. This means that other measures are required to sufficiently improve air quality.

[The Action Plan therefore needs measures beyond the Abingdon Integrated Transport Strategy.](#)

Introduction

The Council must identify locations where levels of pollutants exceed the national air quality objectives. Where it finds any exceedences, the Council must declare an 'Air Quality Management Area', and then prepare an Action Plan to show what can be done to improve the air quality in that area. There may be situations where it is not possible to achieve the national standards through local measures alone.

The Action Plan ranked 33 proposed measures to reduce air pollution. These were divided into Traffic Management, Provision of Alternatives, Planning and Education & Information. The highest ranked measure (13) was "To encourage more traffic onto the peripheral road (improved signage)". The second highest measures (12) included the Lodge Hill Junction, new bridges, a low Emission Zone etc.

5.2. Tables of Proposed Measures

Traffic Management							
Paragraph In Appendix	Proposed Measure	Impact on air quality Score: 1-Low 5-High	Cost Score: 1-High 5-Low	Feasibility Score: 1-Low 5-High	Responsible authorities 'VWH' Vale of White Horse DC 'OCC' Oxfordshire County Council	Timescale	Ranking Score
4.14	To encourage more traffic onto the peripheral road (improved signage)	2	4	5	OCC	Short	13
4.5	To investigate making the A34 Lodge Hill Junction into a four way interchange	4	1	3	Highways Agency	Long	12

April 2012 Detailed Assessment of Air Quality Alongside Ock Street and Marcham Road, Abingdon for Vale of the White Horse District Council

Population Exposure

3.9 Objective exceedences are predicted at approximately 30 residential properties. Assuming that each property has on average two occupants, this equates to approximately 60 residents.

4.3 The assessment has identified that the annual mean nitrogen dioxide objective is being exceeded at a number of relevant locations alongside Ock Street and Marcham Road.

4.4 it is therefore recommended that an AQMA is declared to include, as a minimum, those residential properties that lie within the $32 \mu\text{g}/\text{m}^3$ contour to be precautionary. This should include both Abingdon Court Residential Care Home and the southern buildings belonging to Abingdon Community Hospital.

4.6 The following can be concluded from the series of reports.

- 1 **There is a serious air quality problem in Abingdon town centre with the affected area increasing.**
- 2 **The Vale has been advised to extend the AQMA along Ock Street (2008 & 2012) and Marcham Road (2012) for approximately 60 residents. This includes the vulnerable people in the Abingdon Court Residential Care Home and the Abingdon Community Hospital (2012).**
- 3 **The Vale has ignored the expert advice and has not extended the AQMA.**
- 4 **The highest ranked mitigation measure in the Action Plan (2009) was “to encourage more traffic onto the peripheral road (improved signage)”.**

4.7 In 2014, the Vale published a consultation document to update the Air Quality Action Plan. The results of the consultation remain unpublished. Extracts from the draft are shown below.

2014 DRAFT Air Quality Action Plan consultation document

Air pollution and health

The health risks of NO₂ because it's an irritant gas are that it can cause inflammation of the eyes, nose, throat and respiratory tract especially amongst those with existing respiratory problems. It can have both short-term 'acute' effects and long-term 'chronic' effects. The acute effects are caused by exposure to high levels of NO₂ in a short timeframe, but this is not a problem in the Vale of White Horse. Chronic effects are caused by exposure to lower levels of NO₂ over a long period of time. In the two areas we have declared as AQMAs NO₂ exceeds the standard of 40 micrograms per cubic metre of air (µg/m³) and over a long period of time could lead to chronic health effects, hence the need for this plan.

The Vale therefore confirms that NO₂ continues to exceed the government's health standard in the Abingdon AQMA which can lead to chronic (*long-term*) health effects.

What's been done so far

One of the major actions was the introduction of a traffic management system. This was an Oxfordshire County Council (OCC) initiative called Abingdon Integrated Transport Strategy (AbiTS), designed to smooth the traffic flow within Abingdon and reduce queuing times. Although the air quality benefits have been positive doubts remain about the overall economic benefit of this scheme.

The Abingdon Integrated Transport Strategy has not been an economic success.

The draft Action Plan identifies 11 unranked measures to reduce air pollution.

11) Introduce south facing slip roads to Lodge Hill interchange

Possible increased use of A34 by local traffic may not be welcomed by Highways Agency.

The Highways Agency do not want additional traffic to use the A34 as a north / south bypass.

The peripheral route is not mentioned anywhere in the document.

There is no mention of any new bridges or link roads.

There is no mention of enlarging the AQMA.

Appendix 3 LEGISLATION

When a local authority establishes, through its annual review and monitoring that an objective is not likely to be met it must declare an Air Quality Management Area (AQMA). It must then prepare and implement a remedial action plan to work towards achieving the air quality.

The Vale must implement a remedial action plan.

4.8 The following can be concluded from the draft Action Plan.

- 1 **The Vale confirms that NO₂ pollution in the Abingdon AQMA continues to exceed the government's health standard which can lead to chronic (*long-term*) health effects.**
- 2 **The Vale will not enlarge the Abingdon AQMA. This is contrary the expert advice of Professor Duncan Laxen commissioned by the Vale for the 2008 Further Assessment and 2012 Detailed Assessment. The Abingdon Court Residential Care Home and the Abingdon Community Hospital remain outside the AQMA although these have been clearly shown to be at risk.**
- 3 **The Vale confirms that the Highways Agency will not welcome changes to the Lodge Hill interchange.**
- 4 **There is no mention of new bridges or link roads. These aspirations seem to have been abandoned.**
- 5 **The Vale must implement a remedial action plan and not undermine essential measures because of other pressing needs.**
- 6 **There is no mention of encouraging traffic onto the peripheral road. There are three possible reasons for this omission.**
 - a. **The *improved signage* has been actioned.**
 - b. **No more traffic can be *encouraged* onto the peripheral route.**
 - c. **The peripheral route will no longer exist as a viable northern bypass.**

4.9 The future of the Air Quality Management Area (AQMA) was recently discussed with reference to the proposed pelican crossings on Marcham Road and Ock Street. These are the comments written by Adrian Duffield the Vale Head of Planning 24th March 2014. http://mycouncil.oxfordshire.gov.uk/documents/s27283/CMDE_OCT0914R07.pdf

The district council has been monitoring air quality in the vicinity of the Ock Street roundabouts for some years. Pollution is often high and has regularly exceeded safety limits, and the council is considering designation of an Air Quality Management Area for Ock Street and Marcham Road.

4.10 Strangely the extension of the AQMA being considered by Adrian Duffield the Head of Planning on 24th March 2014 is not mentioned anywhere in Air Quality Action Plan 2014 consultation document. The consultation document suggests removal of the AQMA.

What's been done so far. The general actions within this plan will have a positive effect on the air quality in Abingdon and if the situation improves or remains the same we will reduce or remove the AQMA.

4.11 The extension of the existing Town Centre AQMA to include Marcham Road and Ock Street would acknowledge that air pollution in Abingdon is getting progressively worse and is not improving.

5. Planning

5.1 There are two planning documents relevant to air quality that the Vale must follow.

National Planning Policy Framework

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/6077/2116950.pdf

124. Planning policies should sustain compliance with and contribute towards EU limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan.

This corresponds to page 10 of appendices to the Local Plan².

- Investigate potential noise and air pollution impacts from the A34, A4183, Dunmore Road & Twelve Acre drive and mitigate (if required) to offset any adverse impacts

Environmental Protection UK Development Control: Planning For Air Quality (2010 Update)

http://www.iaqm.co.uk/text/guidance/epuk/aq_guidance.pdf

3. Introduction to Planning

3.5 Local authorities will however retain the responsibility for decisions on all other developments. In arriving at a decision about a specific proposed development the local planning authority is required to achieve a balance between economic, social and environmental considerations. For this reason, appropriate consideration of issues such as air quality, noise and visual amenity is necessary. In terms of air quality, particular attention should be paid to the potential for the development to give rise to breaches of the national air quality objectives and of EU Limit Values, to whether the development will materially affect any air quality action plan or strategy, and to the overall degradation in local air quality. It is also important to consider whether the development will introduce new public exposure into an area of existing poor air quality.

This corresponds to page 10 of appendices to the Local Plan².

- Consider potential impact on Abingdon-on-Thames Air Quality Management Area (AQMA) and mitigate (if necessary).

Therefore, the impact of the proposed north Abingdon housing development on the existing Air Quality Management Area (AQMA) in Abingdon town centre must be considered and mitigated, if necessary.

6. Public Health

6.1 The Vale confirms in the series of Review and Assessment reports and the Action Plan that NO₂ pollution in the Abingdon AQMA continues to exceed the government's health standard which can lead to chronic (*long-term*) health effects.

6.2 The health impact of air pollution was recently placed in context by Public Health England. Here are extracts from their 2014 report⁶:

Estimating Local Mortality Burdens associated with particulate pollution⁶.

Abstract

Current levels of particulate air pollution have a considerable impact on public health. Measures to reduce levels of particulate air pollution, or to reduce exposure of the population to such pollution, are regarded as an important public health initiative.

1.1 Health effects of air pollution

Although local authorities do not have a direct responsibility to control PM_{2.5} concentrations, any of the measures that local authorities can use to reduce levels of PM₁₀ and NO₂ will also reduce emissions of PM_{2.5}.

ESTIMATING LOCAL MORTALITY BURDENS ASSOCIATED WITH PARTICULATE AIR POLLUTION

TABLE 1 Continued

Area	Population age 25+ (x 10 ³)	Deaths age 25+	Mean anthropogenic PM _{2.5} (µg m ⁻³) ^a	Attributable fraction [†] (%)	Attributable deaths [‡] age 25+	Associated life-years lost [§]
Oxfordshire CC	437.2	4967	9.8	5.6	276	2944
Cherwell	97.4	1090	9.9	5.6	61	638
Oxford	91.3	920	10.6	6.0	55	673
South Oxfordshire	92.4	1077	9.6	5.4	59	608
Vale of White Horse	83.1	936	9.8	5.6	52	557
West Oxfordshire	73.0	944	9.2	5.2	49	468
Wycombe	112.1	1165	10.1	5.7	66	768

6.3 Public Health England associate NO₂ pollution with the more damaging PM₁₀ and PM_{2.5} particulate pollution. NO₂ is measured in the Vale but PM₁₀ and PM_{2.5} are not.

6.4 They estimate that particulate pollution kills an additional 52 people in the Vale each year in the 25+ age group. This is 5.6% of all deaths in this age group. Clearly, the most deaths will be in the highly polluted AQMAs in Abingdon and Botley. Presumably the most at risk are the elderly and infirm such as in the Abingdon Community Hospital and Abingdon Court Residential Care Home. These locations were identified by Professor Duncan Laxen (2012) and ignored by the Vale.

6.5 The Public Health England report was reviewed by the Independent newspaper.

The Independent Thursday 10 April 2014

<http://www.independent.co.uk/life-style/health-and-families/health-news/air-pollution-reduces-life-expectancy-by-six-months-for-every-briton-9251260.html>

The report found that pollutants contribute to 29,000 deaths in the UK a year, and the average British citizen has their life expectancy shortened by six months because of long-term exposure to pollutants caused by car exhausts, industry and domestic energy use.

Air pollution is never the single cause of death, rather it is a factor which can exacerbate underlying health problems, including respiratory illnesses like asthma or COPD, as well as cardiovascular conditions.

Dr Sotiris Vardoulakis, PHE's head of air pollution and climate change said that the advice meant that people living in high pollution areas should be aware of their heightened risk of respiratory and cardiovascular disease.

[Have the Vale advised the vulnerable people in the Abingdon AQMA?](#)

7. Air Pollution Infraction Fines

7.1 Defra wrote to all Local Authorities on 15th May 2014 about EU's legal action over the UK's failure to meet air quality standards. This may result in fines of £300m each year. <https://www.gov.uk/government/publications/air-pollution-infraction-fines>

You may have heard that the European Commission has formally launched infraction proceedings against the UK for breach of nitrogen dioxide limit values under the EU Air Quality Directive. This is to give you some further background as to what that means.

For completeness, we feel we ought to remind you of the discretionary power in Part 2 of the Localism Act under which the Government could require responsible authorities to pay all or part of an infraction fine.

7.2 On 19th November 2014 the EU Court of Justice (CJEU) ruled that UK continued to breach the air quality limits. Defra will now decide which Local Authorities have failed to take action to reduce air pollution and are required to pay part of the infraction fine.

8. House of Commons: Action on Air Quality

8.1 The Environmental Audit Committee of the House of Commons published their report in November 2014 entitled Action on Air Quality. Their analysis was general very scathing of UK policy on air quality and the consequences failing to meet the EU Directives.

Summary

The UK Government has been found guilty of failing to meet EU air quality targets in our cities, some of which will not meet the required limits until 2030. However, meeting EU standards should be the minimum requirement. Regardless of EU rulings it is unacceptable that UK citizens could have their health seriously impaired over decades before this public health problem is brought under control.

8.2 The report also addresses the National Planning Policy Framework.

60. The air quality provision in the National Planning Policy Framework provides a basis for local authorities to address air pollution in development applications. Local authorities are able to include air quality provisions in their Local Plans provided they remain consistent with the NPPF. In practice, however, half of authorities have yet to complete their Local Plan, in which case the NPPF itself applies. The NPPF does not provide any guarantee of avoiding worse pollution as a result of development, but rather a means of considering all aspects of sustainability, balancing or trading-off sometimes conflicting economic, social and environmental objectives. Nevertheless, given the urgent need to make real progress in tackling unacceptable pollution, there is a need for the NPPF regime to move that balance more towards air quality protection. The Government should

issue NPPF guidance which makes clearer the great importance of protecting good air quality including protecting green spaces in development planning. Specifically, the NPPF should make it impossible to build new schools, care homes or health clinics near existing air pollution hotspots, and any redevelopment of such existing buildings should only be approved if they reduce pollution exposure for their users. Building regulations should provide for existing schools sited near pollution hotspots to be fitted with air filtration systems.

- 8.3 Note that the report says “*The Government should issue NPPF guidance which makes clearer the great importance of protecting good air quality including protecting green spaces in development planning*”. The proposed housing developments on the Green Belt are therefore contrary to protecting good air quality.
- 8.4 The green space just to the north of the Long Furlong and Peachcroft estates will be lost. This will be replaced by large housing developments and a more heavily trafficked road.
- 8.5 The proposed housing developments will be enclosed by busy routes: the A34, Dunmore Road, Lodge Hill Road and Twelve Acre Road. The western development will be tantalising close to the Green Belt, just over the air pollution and noise emanating from the A34.
- 8.6 The report states “*the NPPF should make it impossible to build new schools, care homes or health clinics near existing air pollution hotspots*”. The Abingdon Court Residential Care Home was built at the busy intersection on Marcham Road in 2006. This was shortly before the Vale was advised to extend the AQMA along Ock Street (2008 & 2012) and Marcham Road (2012) for approximately 60 residents. Homes for the elderly are currently being built along Ock Street in a known air pollution hot spot. Traffic congestion and air pollution in this area is likely to worsen when the northern peripheral road is constricted by the new residential development.
- 8.7 The report recommends fitting air filtration units to *existing* schools. Locating the new infant’s school on the western housing development safely away from the surrounding major roads, particularly the A34, may be impossible.

9. Air Pollution Measurements

9.1 The Vale measures air pollution in Abingdon using a network of passive diffusion tubes attached to lampposts. A brief description is provided on the Vale website <http://www.whitehorsedc.gov.uk/services-and-advice/environment/pollution/air-quality/how-we-monitor>

How the council monitors air quality

Monitoring is carried out at sites where traffic is heaviest and where there are residential properties nearby. Monitoring tubes are also placed at "background" sites for comparison purposes.

The tubes are about 5cm long and normally fixed to lamp posts, they are exposed for a month at a time and sent to the laboratory for analysis and reporting. The results give an indication of the level for the month and the annual results are reported on. Predictions can be made of the level of the pollutant for the future. The results are assessed against the National Air Quality Objectives.

9.2 As mentioned above, the UK has air quality objectives for nitrogen dioxide NO₂ http://uk-air.defra.gov.uk/assets/documents/National_air_quality_objectives.pdf. There is a short term (1 hour) objective for acute health effects and a long term (annual mean) for chronic health effects.

Table 2

National air quality objectives and European Directive limit and target values for the protection of human health							
Pollutant	Applies	Objective	Concentration measured as ¹⁰	Date to be achieved by and maintained thereafter	European obligations	Date to be achieved by and maintained thereafter	New or existing
Nitrogen dioxide	UK	200µg.m ⁻³ not to be exceeded more than 18 times a year	1 hour mean	31 December 2005	200µg.m ⁻³ not to be exceeded more than 18 times a year	1 January 2010	Retain existing
	UK	40µg.m ⁻³	annual mean	31 December 2005	40µg.m ⁻³	1 January 2010	

9.3 The network of inexpensive passive diffusion tubes are retrieved from the lamppost on a monthly cycle. These are chemically analysed to produce a monthly mean NO₂ concentration. The annual mean is therefore the average of twelve tubes. The tubes are therefore ideal for assessing the NO₂ annual mean objective over a wide geographical area. However, the monthly means produced by the tubes say nothing about short pollution peaks of a few hours duration.

9.4 Only expensive continuous monitoring instruments can measure the rapidly fluctuating NO₂ pollution levels at the one hour resolution. These can be deployed at a fixed location within the pollution hot spot but cannot be representative of the entire road network.

9.5 Without the continuous monitoring instruments, the 1 hour objective can only be estimated by assuming a fixed relationship between the 1 hour means and the annual means. This is derived from typical locations in the UK which have the expensive monitoring instruments. This is explained in 2012 Detailed Assessment⁷.

1.10 Measurements across the UK have shown that the 1-hour nitrogen dioxide objective is unlikely to be exceeded unless the annual mean nitrogen dioxide concentration is greater than 60 µg/m³ (Defra, 2009). Thus exceedences of 60 µg/m³ as an annual mean nitrogen dioxide concentration are used as an indicator of potential exceedences of the 1-hour nitrogen dioxide objective.

9.6 However, the traffic in Abingdon is atypical as explained in the following section. There are occasions when the A34 is closed and the entire traffic flow is funnelled through Abingdon. This is likely to produce short term pollution spikes that the passive diffusion tubes cannot measure and the models cannot predict.

10. Air Pollution from Traffic in Abingdon

10.1 Abingdon-on-Thames is well known for traffic congestion. The introduction in 2008 of the Abingdon Integrated Transport Strategy (AbiTS) by the Oxfordshire County Council was designed to smooth the traffic flow within Abingdon and reduce queuing times. This strategy was only partially successful since there are regularly large queues of slow moving traffic within the town centre, on the Vineyard, Bridge Street, Ock Street, Marcham Road and Drayton Road. The design of the AbiTS clearly cannot cope with accidents and fails completely when the A34 is closed.

10.2 The map shows the major roads and roundabouts within Abingdon that are suitable for HGV and articulated vehicles. All other through routes now have speed bumps. There are only four possible routes for these vehicles from Lodge Hill in the north to the Marcham interchange in the west.

- a) The A34
- b) Through the town centre
- c) Anticlockwise around the peripheral route
- d) Clockwise, the long way around the peripheral route and into the town centre



10.3 The Oxford Mail reported separate road accidents on the A34 on the 15th, 17th, 19th, 21st, 22nd, 24th, 25th and 27th of November 2014
<http://www.oxfordmail.co.uk/search/?search=a34+crash> . Clearly newsworthy accidents are a regular occurrence on the A34. However, the effect on the traffic flow through Abingdon and the acute (short-term) public health consequences are largely unreported.

10.4 There was recently a fatal accident on Thursday 27th November. The police closed the road towards Lodge Hill roundabout in both directions for three hours from 5:30 pm. A consequence of the tragic accident was a queue of vehicles stationary from the Marcham roundabout and along Dunmore Road to Lodge Hill resulting in lengthy delays for travellers across the region.

http://www.oxfordmail.co.uk/archive/2014/11/28/11631994.Crash_witnesses_wanted_after_woman_81_killed

10.5 Occasionally the police are forced to close the A34 and divert the traffic through Abingdon. Here are three recent examples

Wednesday 27th November 2013 when the A34 by Abingdon was blocked for 11 hours
http://www.oxfordmail.co.uk/news/10836328.Crash_chaos_prompts_new_calls_to_sort_out_the_A34

Saturday 29th November 2014. Lorry crash shuts A34. One lane of the A34 was closed for almost four hours after a crash between two lorries yesterday. The collision happened at 3.54am on the eastbound lane between the Marcham Interchange and the A4183 North Abingdon turn.

http://www.oxfordmail.co.uk/archive/2014/11/29/11634518.Lorry_crash_shuts_A34

Monday 15th December 2014 at 00:30 am with the A34 southbound between Botley and Milton closed for several hours until 3:30 pm.

http://www.oxfordmail.co.uk/archive/2014/12/15/11666461.Update_Passenger_tells_of_being_flung_around_when_a_lorry_hit_coach_on_A34

This photo was taken at 08:30 showing HGVs crawling along the 40 mph Dunmore Road.



10.6 There have also been occasions when the police are forced to close both carriageways on the A34. Then Abingdon has to accommodate the entire flow of the A34 within the limited road network.

10.7 One regular scenario is the closure of the southbound carriageway just south of the A34 Lodge Hill junction. Traffic is then diverted south from Lodge Hill along the A4183. Then turns right (westward) at the Oxford Road roundabout onto Dunmore Road. The traffic follows the peripheral route and eventually re-joins the A34 at the Marcham roundabout. This diversion works well except during the peak periods. Then the greatly increased traffic flow from the A34 causes heavy congestion along the peripheral route.

10.8 Now imagine this traffic flow after the north Abingdon housing developments are completed. These new residential areas must be properly integrated and assimilated within Abingdon. Pedestrians, children and cyclists cannot be left isolated in the new settlements surrounded by wide busy highways with only a few foot bridges, underpasses or crossings linking to the main body of Abingdon. This will necessitate smaller, safer, cycle friendly, residential roads. Suggestions to widen Dunmore Road and Twelve Acre Drive and build large roundabouts to solve the existing traffic issues are absurd if the new housing is approved.

10.9 Local residents already demand better vehicle access onto Dunmore Road by providing a series of mini-roundabouts. The photo below shows cars queuing to leave Knollys Close onto Dunmore Road. This junction is extremely hazardous during dark winter evenings with cyclist, pedestrians and joggers weaving through the queue.



- 10.10 The huge traffic volume diverted off the A34 at Lodge Hill will reach the Oxford Road roundabout. This may be blocked by the heavy traffic trying to enter the restricted space along Dunmore Road. Large HGV and articulated vehicles will not attempt to navigate the modified road layout. The only clear route is south down the Oxford Road. Once funnelled onto the Oxford Road there are no exits until reaching the gridlocked town centre.
- 10.11 As noted above, newsworthy accidents on the A34 occur every two days. A real possibility is the diversion of the A34 traffic through Abingdon on a cold foggy evening in November. In this weather scenario, the pollution emitted by the vehicle exhausts lingers at ground level. The noxious fumes are then trapped within the long street canyons since most streets in Abingdon old town are enclosed by two storey buildings. Pollution levels consequently rise to dangerous levels and reach the residential properties only a pavement width from the congestion. The highest pollutions may be experienced at the major bottleneck near the Abingdon Court Residential Care Home and Abingdon Community Hospital. The fog may persist throughout the night trapping the pollution under the inversion layer. Eventually the fog and pollution finally disperse the following afternoon.
- 10.12 The scenario described has occurred with the A34 entirely closed during the rush hour and the traffic diverted into Abingdon causing total gridlock. This may coincide with a cold foggy evening when pollution is poorly dispersed and lingers throughout the night into the morning. Dangerously high NO₂ pollution levels above the Government's short-term health threshold are therefore possible for more than 18 hours within the centre of Abingdon. This does not need to be a continuous 18 hours but any 18 occasions throughout the year.
- 10.13 We already know that traffic in Abingdon is very congested. This is made worse when there are accidents on the road network and dramatically worse when the A34 is diverted through Abingdon. The consultant's mathematical models can highlight the residential properties at risk of exceeding the annual mean NO₂ health standard. However these cannot reliably predict the short term pollution peaks or the consequences of road accidents.
- 10.14 The Air Quality Action Plan proposes measures to alleviate the long-term pollution problem such as encouraging traffic onto the peripheral route and the improvements to the Lodge Hill junction. Clearly the Vale cannot build roads for the relief of traffic blockages on the A34. The Vale is therefore unable to address the short-term pollution peaks caused by exceptional traffic flows which regularly occur. In this respect, the traffic and air pollution in Abingdon is atypical being so dependent on a free flowing A34.
- 10.15 Although the Vale cannot stop the police directing traffic off the A34, constricting Dunmore Road and Twelve Acre Drive will force the traffic influx into the town centre just when this peripheral bypass is needed most.

10.16 The Vale will continue to measure the long term annual pollution levels across a wide geographic area but will remain oblivious to the short term peaks along the road network that exceed the Government's health threshold. The sad consequence is that the acute (short term) health effects may be later identified from the large blip in admissions at the JR hospital.

11. Conclusions

11.1 The Vale has fulfilled their statutory duty under Part IV of the Environment Act 1995⁴ to periodically review and assess air quality in their areas.

11.2 The Vale identified Abingdon town centre as experiencing NO₂ pollution levels greater than the government's health guidelines. An Air Quality Management Area (AQMA) was therefore declared in 2006 and the Abingdon Integrated Transport Strategy was introduced in 2008.

11.3 The Vale published an Action Plan in 2009¹ to minimise air pollution in the Abingdon AQMA. The highest ranked measure was

- “to encourage more traffic onto the peripheral road (improved signage)”

11.4 The second highest measure was

- “To investigate making the A34 Lodge Hill Junction into a four way interchange”

11.5 What has happen since the 2009 Action Plan?

11.6 The Vale confirms that NO₂ pollution in the AQMA continues to exceed the health standard which can lead to chronic (*long-term*) health effects (2014).

11.7 The area affected by air pollution above the health standard has increased (2008 & 2012).

11.8 The Vale published a draft of a new Action Plan (2014).

- The Vale will not enlarge the AQMA. This is contrary the expert advice of Professor Duncan Laxen the author of the 2008 Further Assessment and 2012 Detailed Assessment. The Abingdon Court Residential Care Home and the Abingdon Community Hospital remain outside the AQMA although these have been clearly shown to be at risk.
- Adrian Duffield the Head of Planning on 24th March 2014 suggested including Marcham Road and Ock Street within the AQMA but this is not mentioned anywhere within this document. An extension would acknowledge that air pollution in Abingdon is getting progressively worse and is not improving.
- The Vale confirms that the Highways Agency will not welcome changes to the Lodge Hill interchange. The HA will not want additional traffic using the congested A34 as a north – south bypass. Residents will not risk entrapment in the A34 jams and will continue to traverse the polluted town centre. This measure remains a distant aspiration.

- There is no mention of encouraging traffic onto the peripheral road. There are three possible reasons for this omission.
 - a. The *improved signage* has been actioned
 - b. No more traffic can be *encouraged* onto the peripheral route.
 - c. The peripheral route will no longer exist as a variable northern bypass.

11.9 Public Health England estimates that particulate pollution kills an additional 52 people in the Vale each year. Clearly, the most deaths and the chronic health effects will be in the highly polluted Abingdon AQMA which should include the elderly and infirm in the Abingdon Court Residential Care Home and Abingdon Community Hospital.

11.10 Defra have threatened to divide an expected infraction fine from the EU between Local Authorities that have failed to reduce air pollution.

11.11 What is the Vale doing about the air quality in Abingdon Town Centre?

11.12 In 2014, the peripheral road was constricted to a single lane by remodelling the Wotton Road Roundabout. There were very sensible safety improvements but these exacerbated the traffic congestion along the busy peripheral road. The number one measure of the Vale's Action Plan to alleviate air pollution in the town centre, which is a statutory duty, was undermined. This is an indication of more traffic chaos in the near future. Sandy Lovatt of the Vale of White Horse was aghast when the new roundabout was completed. The excuse was that the money came from a government initiative. The planners have therefore already undermined their own plans to alleviate a known public health problem.

11.13 In 2014, the Vale proposed a large housing development straddling the peripheral route. The development must be adequately and safely assimilated within Abingdon. Pedestrian crossings, roundabouts, traffic calming, bus laybys and a 30 mph limit on Dunmore Road will inevitably impede free flowing traffic along this route. Suggestions to widen Dunmore Road and Twelve Acre Drive and build more roundabouts to solve the existing traffic problems are absurd if the new housing is approved.

11.14 Dunmore Road and Twelve Acre Drive are currently long sweeping highways that can accommodate large HGV and articulated lorries. These will not venture through the residential area and risk entrapment within the new street architecture. The only alternative is down the Oxford Road, through the town centre and along Ock Street and Marcham Road. This will significantly increase diesel emissions, which are known to be the most dangerous source of air pollution, within the pollution hotspot. The Vale certainly does not want more diesel vehicles in the AQMA.

11.15 The Vale cannot be expected to build roads to accommodate the huge influx of traffic wherever the A34 is closed. However, the reality is that there are accidents every two days on the A34 which impacts the entire region. Perhaps twice a year either the A34 or a link road is closed which cause log jams across Abingdon for several hours. The Vale must make plans to manage this exceptional traffic flow of HGVs and highly polluting diesel vehicles.

11.16 The Vale must consider the effect of exceptional traffic flows on the air pollution in north Abingdon and the AQMA. This is in addition to average flows and the weekly pattern of rush hours. Confining heavy duty traffic diverted off the A34 within a new residential estate cannot be healthy.

11.17 The peripheral route is needed to alleviate air pollution and traffic congestion in Abingdon town centre and along the Marcham Road – Ock Street artery during peak periods and whenever the A34 is closed. There are no alternative routes. The Vale cannot ignore the public health impact of the northern housing development on the already existing air pollution problem in Abingdon town centre. Economic development and housing needs cannot knowingly degrade public health.

11.18 The Policy Guidance⁵ for the Environment Act says: ***The Action Plan itself should take a practical approach towards focussing on what really matters.*** The Vale in the draft Action Plan (2014) has clearly run out of real practical ideas for reducing the high air pollution in Abingdon town centre.

11.19 The number one measure in the current Action Plan (2009) is:

- ***To encourage more traffic onto the peripheral road (improved signage)***

11.20 This should now be reworded.

- ***To discourage any traffic onto the peripheral road (traffic impediments)***

11.21 Where will Sat Navs automatically direct traffic in future?

- a) Along the Dunmore Road
- b) Squeeze through the remodelled Dunmore Road and the new residential estate
- c) Through Abingdon Town Centre and the Air Quality Management Area (AQMA)

Dunmore Road Monday 15th December 2014 8:30 am during the southbound A34 closure



12. References

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- 6 Estimating Local Mortality Burdens associated with particulate pollution. 9 April 2014
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- 7 April 2012 Detailed Assessment of Air Quality Alongside Ock Street and Marcham Road, Abingdon for Vale of the White Horse District Council. April 2012.
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- 8 Action on Air Quality, House of Commons Environmental Audit Committee. HC 212. Sixth Report of Session 2014–15. 26 November 2014.
<http://www.parliament.uk/documents/commons-committees/environmental-audit/HC-212-for-web.pdf>

All other reports are available on the Vale website

<http://www.whitehorsedc.gov.uk/services-and-advice/environment/pollution/air-quality>