

The logo of West Dorset District Council is a circular emblem. It features a central figure, possibly a dragon or a similar mythical creature, with its wings spread. The figure is surrounded by a circular border containing the text "WEST DORSET DISTRICT COUNCIL" in a serif font. The logo is rendered in a light grey color.

Updating & Screening  
Assessment  
2006

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## 1. EXECUTIVE SUMMARY

### 1.1 Outline

This Updating and Screening Assessment has been produced by West Dorset District Council to satisfy the statutory requirements within Part IV of the Environment Act 1995 – an obligation for local authorities to periodically review and assess the current and likely future air quality in their area, to assess if health based air quality objectives will be met.

The Assessment aims to show the air quality status for the last 12 months and identifies any further proposed actions by West Dorset District Council.

### 1.2 Methodology

In order to satisfy Department of Environment Food and Rural Affairs (Defra) requirements within the Updating and Screening Assessment (USA), the document Technical Guidance (LAQM.TG(03)), and its updated USA checklist (January 2006) were consulted.

In addition, previous reports and assessments produced by West Dorset District Council were referred to, to establish any improvements or changes in air quality, in the District as per LAQM.TG (03)'s guidance. Previous reports used were:

Updating and Screening Assessment 2003;  
Progress Report 2004; and  
Detailed Assessment 2005/6 (Nitrogen Dioxide).

These are held within the Environmental Protection section of West Dorset District Council

A website has been created to assist local authorities with production of their reports and comply with legislation ([www.uwe.ac.uk/agm/review/](http://www.uwe.ac.uk/agm/review/)). Historical air quality mapping can also be found on the internet ([www.airquality.co.uk/archive/laqm/tools/aq\\_maps\\_2001.pdf](http://www.airquality.co.uk/archive/laqm/tools/aq_maps_2001.pdf)). Both tools were used to complete this USA.

### 1.3 Results

There are seven pollutants listed within the legislation for local authorities to consider. These are:

**Carbon Monoxide**  
**Benzene**  
**1,3 butadiene**  
**Lead**  
**Sulphur Dioxide**  
**PM<sub>10</sub> (particulates)**  
**Nitrogen Dioxide**

Within the previous USA and Progress Reports it has been identified that there is no risk that air quality objectives will be exceeded for six out of the seven pollutants listed above. Nitrogen dioxide has been identified as a pollutant that exceeds the objectives laid down within the legislation (refer to Table 1), this Assessment will identify where the exceedances are and indicate West Dorset District Council's next course of action in relation to them.

Within paragraph 2.2, it is stated there is a need to designate an Air Quality Management Area within Chideock (for nitrogen dioxide). In order to obtain 'real time' figures for this pollutant, a chemiluminescent analyser is required and further 'passive' monitors (diffusion tubes) within the area.

#### 1.4 Recommendations

The key outcomes of this assessment are as follows:

- Declare an Air Quality Management Area in relation to nitrogen dioxide;
- Review existing nitrogen dioxide monitoring sites;
- Apply for a grant to assist with the purchase of real time monitoring equipment; and
- Improve the quality of the information available to the public on our website.

## 2. INTRODUCTION

### 2.1 Purpose of the Report

The purpose of this report is to identify any significant changes that may have occurred since the last formal assessment of air quality. This was by way of an Updating and Screening Assessment in 2003, and a Detailed Assessment for Nitrogen Dioxide, completed in July 2006.

### 2.2 Summary of the Conclusions of the Updating & Screening Assessment

<b>Carbon monoxide -</b>	No further action required
<b>Benzene -</b>	No further action required
<b>1,3 butadiene -</b>	No further action required
<b>Lead -</b>	No further action required
<b>Sulphur dioxide -</b>	No further action required
<b>PM10 -</b>	No further action required
<b>Nitrogen dioxide –</b>	Proceed to designation of an Air Quality Management Area within the Chideock area of the District; re-assess current passive monitoring sites within West Dorset; and obtain a chemiluminescent analyser for real time monitoring within Chideock.

### 2.3 Air Quality Objectives

The objectives for each pollutant mentioned above can be found over in Table 1.

**Table 1 - Air Quality Objectives Relevant to this Report**

Pollutant	Objective	Measured by	To be Achieved by
Benzene	16.25µg/m <sup>3</sup>	Running annual mean	31.12.03
	5µg/m <sup>3</sup>	Annual mean	31.12.03
1-3 Butadiene	2.25µg/m <sup>3</sup>	Running annual mean	31.12.03
Carbon Monoxide	10 µg/m <sup>3</sup>	Maximum daily running 8 hr mean	31.12.03
	0.5 µg/m <sup>3</sup>	Annual mean	31.12.04
Lead	0.25 µg/m <sup>3</sup>	Annual mean	31.12.08
Nitrogen dioxide	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1 hour mean	31.12.05
	40 µg/m <sup>3</sup>	Annual mean	31.12.05
Particles PM <sub>10</sub>	50 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	24 hour mean	31.12.04
	40 µg/m <sup>3</sup>	Annual mean	31.12.04
Sulphur dioxide	350 µg/m <sup>3</sup> not to be exceeded more than 24 times a year	1 hour mean	31.12.04
	125 µg/m <sup>3</sup> not to be exceeded more than 3 times a year	24 hour mean	31.12.04
	66 µg/m <sup>3</sup> not to be exceeded more than 35 times a year	15 minute mean	31.12.05

These pollutants have specific health effects associated with them when found at excessive levels:

**Carbon Monoxide** Prevents the normal transport of oxygen by the blood and can lead to a significant reduction in the supply of oxygen to the heart, particularly in people suffering from heart disease.

**Benzene** Possible chronic health effects include cancer, central nervous system disorders, liver and kidney damage, reproductive disorders, and birth defects

**1,3 butadiene** Possible chronic health effects include cancer, central nervous system disorders, liver and kidney damage, reproductive disorders, and birth defects

**Lead** Exposure has been linked to impaired mental

function, visual-motor performance and neurological damage in children, memory and attention span.

- Sulphur Dioxide** Tightness in the chest and coughing occur at high levels and lung function of asthmatics may be impaired to the extent that medical help is required.
- PM<sub>10</sub> (particulates)** Fine particles can be carried deep into the lungs and can cause inflammation and a worsening of the condition of people with heart and lung diseases.
- Nitrogen Dioxide** Can be an irritant to the lungs and lower resistance to respiratory infections such as influenza. May cause increased incidence of acute respiratory illness in children.

### 3. UPDATING & SCREENING FOR CARBON MONOXIDE

#### 3.1 Summary for Carbon Monoxide

<b>Source, location or data which need to be assessed</b>	<b>Action</b>
New monitoring data	No further action required
Very busy roads or junctions in built up areas	No further action required

#### 3.2 New Monitoring Data

There has been no new monitoring data collected within WDDC. In correspondence to Defra dated December 2003, a predicted background concentration for 2003 was given as of 0.2mg/m<sup>3</sup>

#### 3.3 Very Busy Roads

There are no roads identified to be 'very busy' as per LAQM.TG(03). Past monitoring data from throughout the country have identified these areas to be where exceedances would occur.

#### 3.4 Conclusion

No further action needed for carbon monoxide.

## 4. UPDATING & SCREENING FOR BENZENE

### 4.1 Summary for Benzene

Source, location or data which need to be assessed	Action
New monitoring data	No further action required
Very busy roads or junctions in built-up areas	No further action required
Industrial sources	No further action required
Petrol Stations	No further action required
Major petroleum storage depots	No further action required

### 4.2 New Monitoring Data

No monitoring for benzene has been carried out within WDCC as no significant sources have been identified.

[http://www.airquality.co.uk/archive/laqm/tools/aq\\_maps\\_2001.pdf](http://www.airquality.co.uk/archive/laqm/tools/aq_maps_2001.pdf) indicates the predicted background concentrations for this pollutant are below  $0.3\mu\text{g}/\text{m}^3$  for 2010 (within the South West).

### 4.3 Very Busy Roads or Junctions in Built-Up Areas

The objective of  $5\mu\text{g}/\text{m}^3$  is likely to be exceeded at busy roads or junctions if the background level is likely to be  $2\mu\text{g}/\text{m}^3$  at those areas. There are no roads that fall into this category within the WDDC.

### 4.4 Industrial Sources

There were no industrial sources identified within the District and neighbouring local authorities with the potential to release significant quantities of benzene to the air. There are no new industrial sources in the area.

### 4.5 Petrol Stations

According to the guidance (LAQM.TG(03)) there is a possibility that the objective could be exceeded where there is a petrol station with an annual throughput of  $2000\text{m}^3$  of petrol and a busy road (>30,000 vehicles per day) nearby and with relevant exposure within 10 meters.

There are petrol stations within WDDC which fall into this category, however, the pumps are not within 10 meters of residential dwellings. It is unlikely that the 2010 objective will be exceeded.

There are no major petrol storage depots in WDDC.

### 4.6 Conclusion

No further action needed for benzene.

## 5. UPDATING & SCREENING FOR 1,3-BUTADIENE

### 5.1 Summary for 1,3-Butadiene

<b>Source, location or data which need to be assessed</b>	<b>Action</b>
New monitoring data	No further action required
New industrial sources	No further action required
Existing industrial sources with significantly increased emissions	No further action required

### 5.2 New Monitoring Data

No monitoring has been carried out for this pollutant within WDDC. According to [http://www.airquality.co.uk/archive/laqm/tools/aq\\_maps\\_2001.pdf](http://www.airquality.co.uk/archive/laqm/tools/aq_maps_2001.pdf) the background concentration was estimated to be below 0.1 µg/m<sup>3</sup> (within the South West). There are no particular sources of this pollutant within the district, except for road traffic.

### 5.3 New Industrial Sources

No industrial sources were identified in the last Updating and Screening Assessment and there have been no subsequent industrial developments in the West Dorset area which would give rise to significant emissions of 1,3-butadiene.

### 5.4 Conclusion

No further action needed for 1,3-butadiene.

## 6. UPDATING & SCREENING FOR LEAD

### 6.1 Summary for Lead

<b>Source, location or data which need to be assessed</b>	<b>Action</b>
New monitoring data	No further action required
New industrial sources	No further action required
Existing industrial sources with significantly increased emissions	No further action required

### 6.2 New Monitoring Data

No monitoring has been carried out for this pollutant within WDDC. Previous measured concentrations of lead at background and kerbside locations throughout the UK indicated no exceedances of the 2008 objective.

### 6.3 New Industrial Sources

No industrial sources were identified in the earlier Updating and Screening Assessment and there are no new industrial developments in the area that would give rise to significant emissions of lead.

### 6.4 Conclusion

No further action needed for lead.

## 7. UPDATING & SCREENING OF NITROGEN DIOXIDE

### 7.1 Summary for Nitrogen Dioxide

<b>Source, location or data which need to be assessed</b>	<b>Action</b>
New monitoring data outside an AQMA	AQMA to be designated
New monitoring data within an AQMA	No current AQMA
Narrow congested streets with residential properties close to the kerb	No further action required
Junctions	No further action required
Busy streets where people may spend 1-hour or more close to traffic	These will be considered within the Air Quality Action Plan
Roads with high flow of buses and/or HGVs	No further action required
New roads constructed or proposed since first round of Review and Assessment	No further action required
Roads with significantly changed traffic flows	No further action required
Bus Stations	No further action required
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required
Aircraft	No further action required

### 7.2 New Monitoring Outside of an AQMA

Monitoring has continued since the submission of the Detailed Assessment for nitrogen dioxide in 2005 with 21 passive monitoring sites. Appendix I identifies the locations. (For more detailed information on specific locations, please refer to the Detailed Assessment of 2005).

The diffusion tubes are supplied and analysed by Gradko. These are 50% TEA in Acetone. Although WDDC are not part of the Nitrogen Dioxide Diffusion Tube Network, the tubes are handled in the same manner in that they are exposed for a period of 4-5 weeks; use of a field blank, and correct storage prior to, and after exposure.

Currently, only passive monitoring, by way of diffusion tubes is undertaken within the West Dorset District.

The diffusion tube annual mean for 2005 can be seen in Table 2. These have been bias adjusted using the factor of 1.18:

**Table 2 – Bias Adjusted Diffusion Tube Results 2005**

<b>Location</b>	<b>Annual Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>
Dorch 1	43.01
Dorch 2	29.7
Dorch 3	31.58
Dorch 4	40.47
Abb	21.69
Brid 1	53.18
Brid 2	14.69
Brid 3	32.9
Chid 1	46.79
Chid 2	37.05
Chid 3	44.46
Lyme 2	30.04
Maid	21.04
Beam 1	28.59
Sher 1	33.87
Sher 2	20.95
Chick	18.7

Note: Only 17 sites listed.  
Remainder of the sites had only 3 or 5 months of data

From the data, there are five monitoring locations (three discrete geographical areas) that have failed to achieve the annual mean. These areas are Dorchester Town Centre, Bridport Town Centre and Chideock.

In accordance with the study by Air Quality Consultants '*Analysis of the relationship between 1 hour and annual mean NO<sub>2</sub> roadside and kerbside monitoring sites*' consideration has been given to the fact that if a monitoring location has an annual mean of more than  $60\mu\text{g}/\text{m}^3$  then the hourly objective would be exceeded. There are no monitoring locations exceeding this figure.

In order to establish the 2006 annual means for the locations within Table 2, the year adjustment calendar was used. The estimated results can be found in Table 3

**Table 3 Estimated 2006 Annual Mean**

<b>Location</b>	<b>Annual Mean (<math>\mu\text{g}/\text{m}^3</math>)</b>
Dorch 1	41.79
Dorch 2	28.86
Dorch 3	30.68
Dorch 4	39.32
ABB	21.07
Brid 1	51.67
Brid 2	14.27
Brid 3	31.96
Chid 1	45.46
Chid 2	36
Chid 3	43.20
Lyme 2	29.19
Maid	20.44
Beam 1	27.78
Sher 1	32.91
Sher 2	20.35
Chick	18.17

The areas of concern are predicted to exceed the objective level for 2006. Comparisons with the annual means from 2003 to 2005 have been made, (Refer to Appendix II) from these results, NO<sub>2</sub> can be seen to have increased in most areas from 2004. As expected, the 2004 annual means for each location fell from the exceptional year of 2003; however, the 2005 data is seen to exceed these data.

Therefore, declaration of an AQMA at Chideock is proposed, and to extend monitoring at Bridport and Dorchester, This has been agreed by Defra as per their letter dated the 19<sup>th</sup> July 2006. Relevant exposure will be considered within each area and diffusion tubes arranged to give representative data. This assessment will be starting in October 2006.

### 7.2.2 Continuous Monitoring Data

No continuous monitoring has been undertaken. A chemiluminescent analyser (as per LAQM. TG (03)) is proposed to be installed at the Chideock area in order for real-time data and co-location to be carried out.

### 7.3 New Monitoring Data – Within an AQMA

There are no AQMAs within WDDC at the present. From Defra's response to the Detailed Assessment for nitrogen dioxide, it is agreed that there will be declaration of an AQMA within the Chideock area, along with co-location of

diffusion tubes. The co-location will allow for a local factor to be calculated and applied to diffusion tubes within the district.

#### 7.4 Road Traffic

There are a number of roads within West Dorset with an AADT over 10,000 per day. Dorset County Council have provided these data and further evaluation of each road within the proposed AQMAs will be undertaken as part of the future Air Quality Action Plan. These roads are primarily within the areas of concern – Dorchester, Bridport and Chideock. Actual annual means recorded at these locations have identified exceedances of the air quality objective and actions proposed in 7.2.

##### 7.4.1 Narrow Congested Streets with Residential Properties Close to the Curb

There are a number of streets that fall into this category, particularly in the Dorchester and Bridport areas. Those within the proposed AQMA will be further evaluated within the Air Quality Action Plan. The remainder may be considered within a further detailed assessment should exceedances still be present in 2006.

##### 7.4.2 Junctions

As above, these will be considered further within the Air Quality Action Plan, or within a detailed assessment.

##### 7.4.3 Busy Streets Where People May Spend 1-Hour or More Close to Traffic

Sites of relevant public exposure will be considered within the Air Quality Action Plan with respect to locations exceeding the objectives.

##### 7.4.4 Roads With High Flow of Buses and/or HGVs

There are no types of these locations within West Dorset.

##### 7.4.5 New Roads Constructed or Proposed

The major planned road for the area is the Weymouth Relief Road. At present, the Highways Authority have submitted a Planning Application to the Planning Authority (Dorset County Council) and is included within the Governments programme in approximately 2011, subject to statutory consents being obtained.

An assessment of air quality associated with the planned Weymouth Relief Road was carried out by Air Quality Consultants in 2005. Within the assessment, an estimate of the annual mean nitrogen dioxide concentrations has been given. Unfortunately, WDDC do not currently monitor in the areas

given in the report, however some base line information has been gathered for future reference.

The summary of the report shows that the new road would improve levels of NO<sub>2</sub> within the outskirts of Dorchester by 2010.

Secondly, a new road was opened in the Chickerell area of West Dorset in the autumn of 2005. This road consists of approximately 1 km of single carriageway and is not a 'busy road' as per LAQM.TG(03). The provision of the road had not made any significant effects to NO<sub>2</sub> results within the local area.

#### 7.4.6 Roads With Significantly Changed Traffic Flows, or New Relevant Exposure

There are no roads within West Dorset which fall into this criteria.

#### 7.4.7 Bus Stations

There are no bus stations within WDDC that fall into a category to be considered, i.e. more than 1000 movements per day.

### 7.5 New Industrial Sources

No industrial sources were identified in the earlier Updating and Screening Assessment and there are no new industrial developments in the area that would give rise to significant emissions of nitrogen dioxide.

#### 7.5.1 Industrial Sources with Substantially Increased Emissions

There are no industrial sources with a substantial increase in emissions.

### 7.6 Conclusion for Nitrogen Dioxide

- Proceed to designation of AQMA in Chideock;
- Undertake assessment of existing sites within Dorchester and Bridport & carry out further monitoring at additional locations within these areas if necessary;
- Apply for grant assistance with respect to purchasing the chemiluminescent analyser; and
- Evaluate the Councils air quality information available on the internet ([www.dorsetforyou.com](http://www.dorsetforyou.com)) and introduce a programme whereby actual nitrogen dioxide figures can be entered and trends shown.

## 8 UPDATING & SCREENING FOR SULPHUR DIOXIDE

### 8.1 Summary for Sulphur Dioxide

Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action needed
New monitoring data within an AQMA	No further action needed
New industrial sources	No further action needed
Industrial sources with substantially increased emissions	No further action needed
Areas of domestic coal burning	No further action needed
Small boilers (>5MW(thermal)) burning coal or oil	
Shipping	No further action needed
Railway Locomotives	No further action needed

### 8.2 New Monitoring Outside an AQMA

No new monitoring for sulphur dioxide has been undertaken within WDDC. Previous measured background concentrations indicated no exceedances of the objectives and the estimated background concentration for 2005 was less than 4µg/m<sup>3</sup>. (Updating and Screening Assessment 2003)

### 8.3 New Monitoring Within an AQMA

There is no AQMA declared within the District.

### 8.4 New Industrial Sources & Industrial Sources with Substantially Increased Emissions

The previous Updating and Screening Assessment did not identify any significant sources of sulphur dioxide and no new sources have been installed.

There are no industrial developments in neighbouring authorities with the potential to release significant quantities of the pollutant to air.

### 8.5 Areas of Domestic Coal Burning

There are no areas within West Dorset where there is a high density of domestic coal burning.

### 8.6 Small Boilers (>5MW(thermal) Burning Coal or Oil)

There are no known boilers with a thermal power greater than 5MW in the District.

### 8.7 Shipping

There are no ports within West Dorset.

### 8.8 Railway Locomotives

There are 2 railway stations within Dorchester and one at Sherborne, none of which are terminus stations; Sherborne has electric only running through it, while the Dorchester stations have both electric and diesel trains running through them. According to First Great Western, it is unlikely a stationary diesel locomotive would be left with its engine running for 15 minutes or more.

### 8.9 Conclusion

No further action needed for sulphur dioxide.

## 9. UPDATING & SCREENING OF PARTICLES (PM<sub>10</sub>)

### 9.1 Summary for PM<sub>10</sub>

Source, location or data which need to be assessed	Action
New monitoring data outside an AQMA	No further action required
New monitoring data within an AQMA	N/A
Junctions	No further action required
Roads with high flow of buses and/or HGVs	No further action required
New roads constructed or proposed since first round of Review and Assessment	No further action required
Roads close to the objective during the first round of Review and Assessment	No further action required
Roads with significantly changed traffic flows	No further action required
New industrial sources	No further action required
Industrial sources with substantially increased emissions	No further action required
Areas with domestic solid fuel burning	No further action required
Quarries, landfill sites, opencast coal, handling of dusty cargoes at ports etc	No further action required
Aircraft	No further action required

### 9.2 New Monitoring Data

No new monitoring for particulate matter has been undertaken within WDDC. The estimated background PM<sub>10</sub> concentration for 2005 is between 10-20 µg/m<sup>3</sup> ([www.airquality.co.uk](http://www.airquality.co.uk)).

Modelling carried out by Air Quality Consultants as part of a planning application for the Weymouth Relief Road has identified no exceedances of the 2004 objective, or the UK provisional Objective for PM<sub>10</sub> in 2010 in two areas within West Dorset: The A354, adjacent to a residential property had an annual mean of <16.9µg/m<sup>3</sup>, with 1 day exceeding the 24-hour mean. Three residential areas adjacent to the A35 gave annual means of between 14.1µg/m<sup>3</sup> and 19.9µg/m<sup>3</sup>, again with 1 day exceeding the 24-hour mean. (Using the AAQuIRE Model)

Using the estimated background PM<sub>10</sub> concentrations at [www.airquality.co.uk](http://www.airquality.co.uk), the 2010 predictions are between 10-15µg/m<sup>3</sup>. The model has identified slightly higher annual means at four sites, however, still within the 2004 objectives.

### 9.3 New Monitoring Data Within an AQMA

There is no AQMA declared within the District.

#### 9.4 Junctions

It is unlikely that there are any busy junctions within West Dorset as per the technical guidance. However, when undertaking an assessment of these within the Air Quality Action Plan, it may be that some are identified. Further evaluation will then be undertaken within the next Progress Report.

#### 9.5 Roads with High Flow of Buses and/or HGVs

There are no types of these locations within West Dorset.

#### 9.6 New Roads Constructed or Proposed

Discussed in 9.2

#### 9.7 Roads with Significantly Changed Traffic Flows, or New Relevant exposure

There are no roads within West Dorset which fall into this criteria.

#### 9.8 Roads Close to the Objective During the Second Round of Review & Assessment

There were no areas identified during the last round.

#### 9.9 New Industrial Sources

There are no new industrial sources within West Dorset.

#### 9.10 Industrial Sources with Substantially Increased Emissions, or New Relevant Exposure

There are no industrial sources that fall into this category within West Dorset.

#### 9.11 Areas of Domestic Solid Fuel Burning

There are no significant areas within West Dorset where domestic solid fuel burning occurs.

#### 9.12 Quarries, Landfill Sites, Opencast Coal or Handling of Dusty Cargoes at Ports

There are no operations of opencast coal mining nor is there a port within West Dorset.

With respect to the quarries and landfill sites, there is one major landfill site within the Warmwell area of West Dorset. This has now ceased accepting waste and is in the process of closing. There are two quarries also in that area. Neither have contributed significantly to levels of PM<sub>10</sub>, as can be seen within the maps at [www.airquality.co.uk](http://www.airquality.co.uk).

### 9.13 Aircraft

There are no airports within West Dorset.

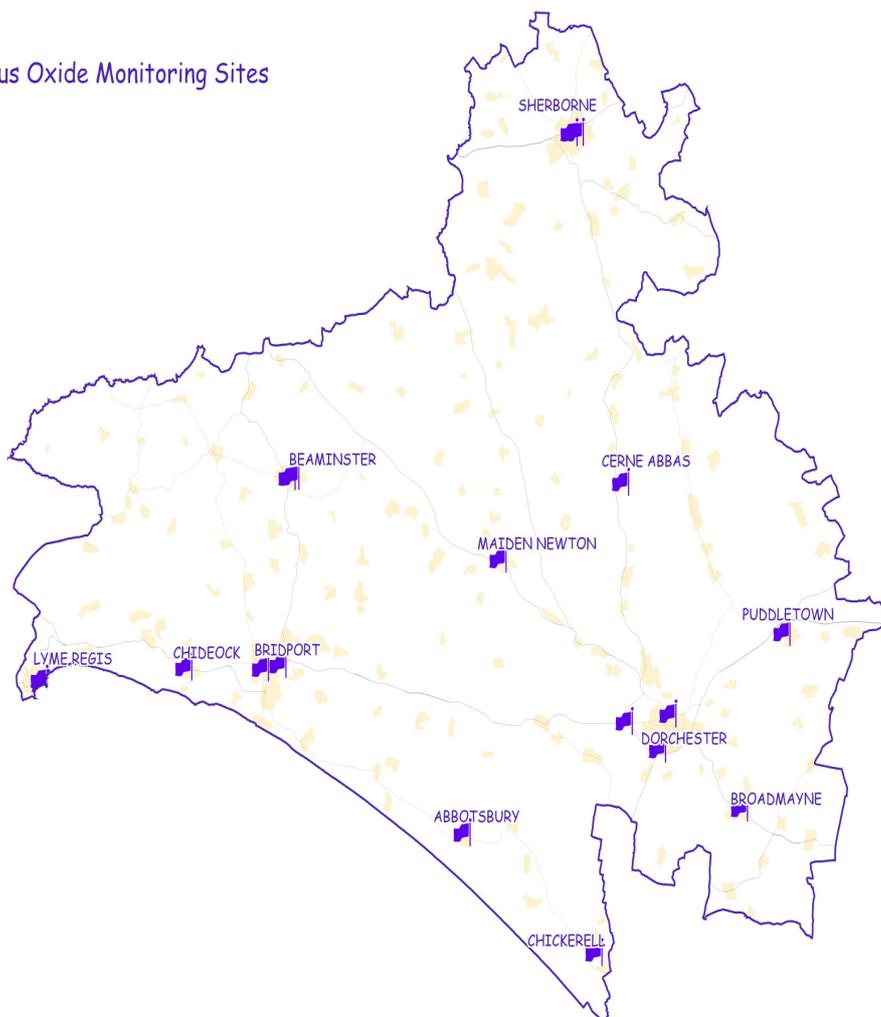
### 9.14 Conclusion

No further action required for PM<sub>10</sub>.

## APPENDIX I

### Location of Existing Passive Monitoring Sites (NO<sub>2</sub>)

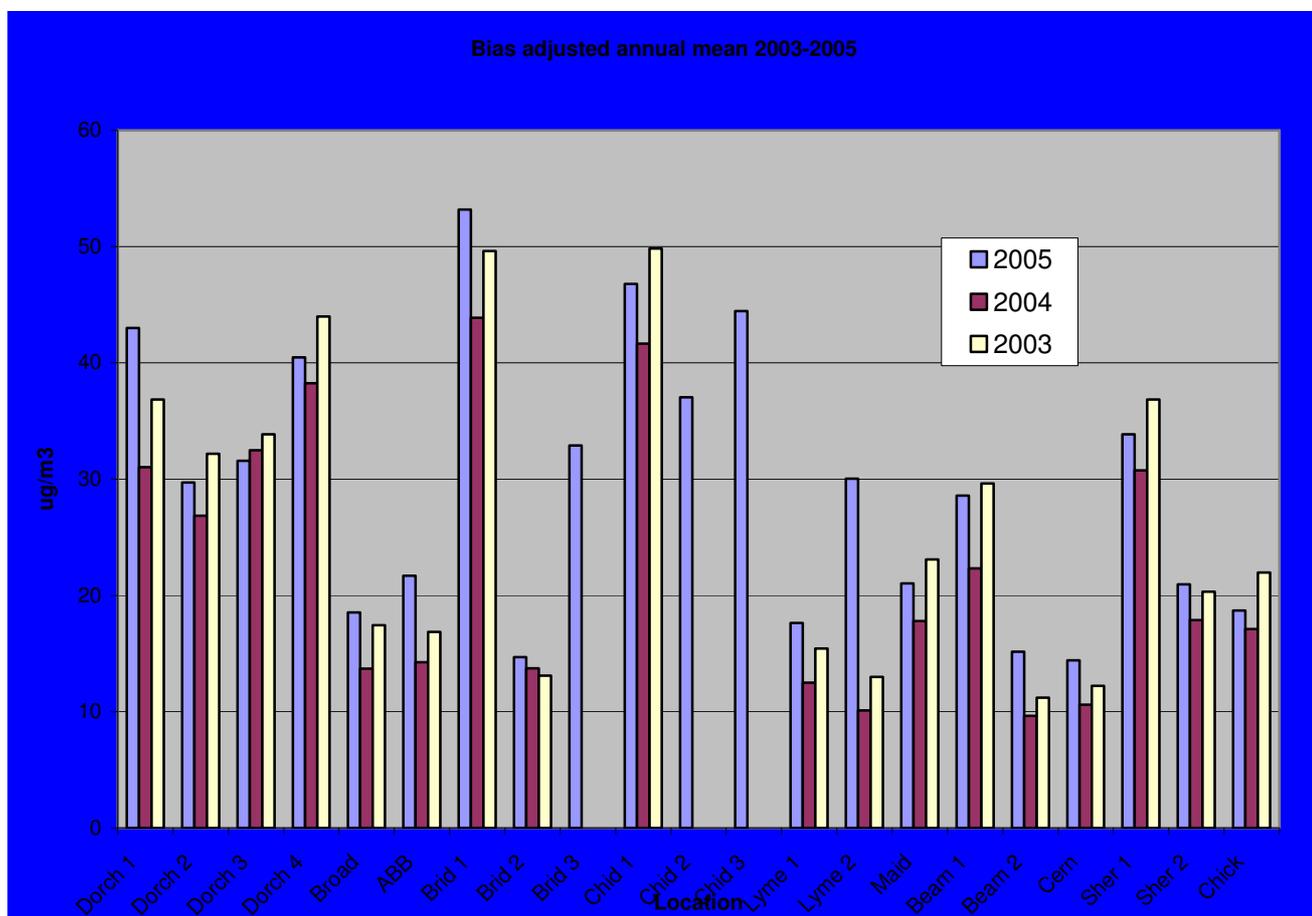
Nitrous Oxide Monitoring Sites



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## APPENDIX II

### Comparison of Annual Mean for Nitrogen Dioxide 2003 – 2005



## References

1. Part IV of the Environment Act 1995, Local Air Quality Management Technical Guidance LAQM.TG(03).
2. Air Quality Review and Assessment website – [www.uwe.ac.uk/agm/review](http://www.uwe.ac.uk/agm/review)
3. Air Quality Archive Website (Maps) [www.airquality.co.uk](http://www.airquality.co.uk)
4. Air Quality Consultants – *'analysis of the relationship between 1 hour and annual mean NO<sub>2</sub> roadside and kerbside monitoring sites'*.