

Local Air Quality Management
Environment Act 1995

AIR QUALITY UPDATING AND SCREENING ASSESSMENT FOR 2008



North Devon Council
Environmental Health and Housing Services
Prepared March/April 2009



2009 Air Quality Updating and Screening Assessment for North Devon Council

In fulfillment of Part IV of the Environment Act
1995
Local Air Quality Management

March / April 2009

North Devon Council - England

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Executive Summary

This Report concludes that:

- 1 The findings in the Progress Report prepared in 2008 in relation to Carbon Monoxide, Benzene, 1,3-Butadiene, Lead, Sulphur Dioxide and PM₁₀ remain valid.
- 2 The measured bias adjusted annual mean concentration of Nitrogen Dioxide for 2008 is greater than the threshold of 40 µg/m³ at sites 12 and 13. The results of previous monitoring undertaken resulted in a detailed assessment being commenced at these sites in March 2009, the results of which shall be reported in April 2010.

Whilst sites 12 and 13 are the only sites to exceed 40 µg/m³ for 2008, it is interesting to note that as a result of previous monitoring undertaken, a detailed assessment was also commenced in March 2009 for site 3. The results for monitoring undertaken in 2008 suggest does not suggest an exceedance of the threshold at this site, however the detailed assessment shall be completed, and the subsequent results reported in April 2010.

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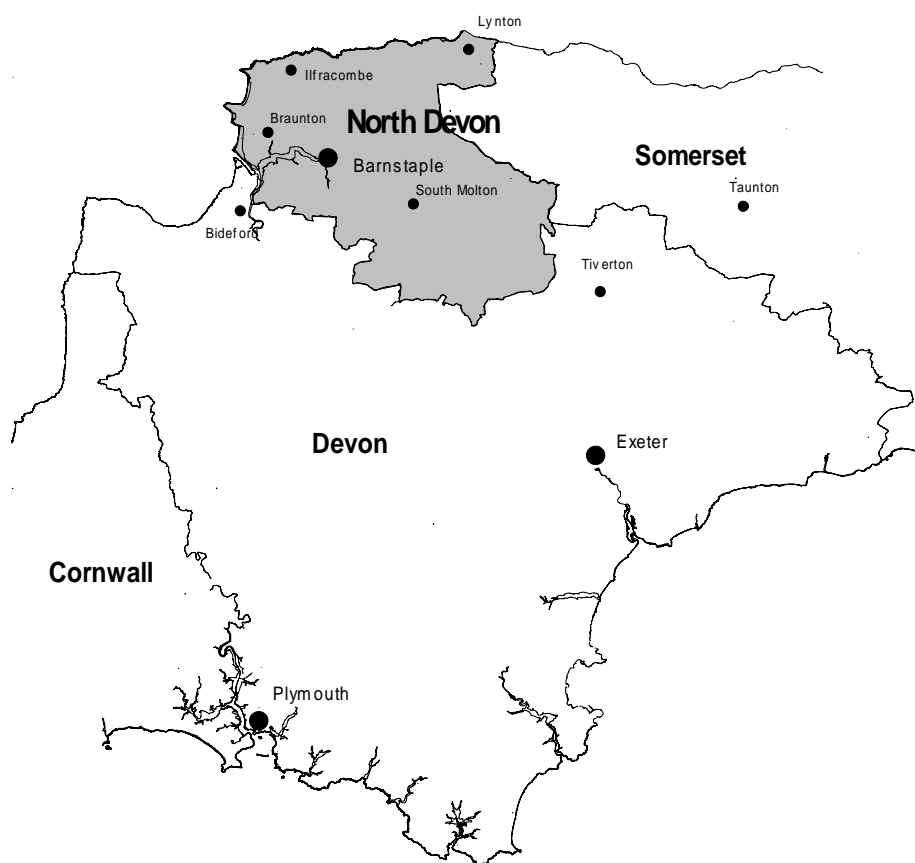
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1 Introduction

1.1 Description of Local Authority Area

The North Devon district occupies the northern most part of the county of Devon, and borders the western borders of Somerset, and the Bristol Channel, covering an area approximately 1085 square kilometres (419sq miles). The area is characterised by a rugged northern Bristol Channel coast, the sandy beaches of the West Coast, the estuarine and valley landscapes of the River Taw, and the open moorland and farmland of the Exmoor fringes. The district includes approximately one third of the area of Exmoor National Park. The character of the North Devon district is inextricably linked to its natural landscape, which is its most prized asset. The landscape is highly valued by residents and tourists alike, and incorporates numerous Sites of Special Scientific Interest, Areas of Outstanding Natural Beauty, and Heritage Coastline.



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The population of the area in 2000 was approximately 91,800, with approximately half the residents living in the four main settlements of Ilfracombe, Braunton, South Molton, and Barnstaple, which is also the regional centre for northern Devon. The remainder of the population lives in the open countryside or in one of the numerous villages and hamlets of the area.

The area has an extensive rural road network and is connected to the rest of the region by the A39, A361 and A377 roads. There is also a regional rail connection between Barnstaple and Exeter, which runs along the valley of the River Taw.

Employment in the district is concentrated in the main settlements. There is a strong dependence on the service industry, especially tourism related in the summer, and also in the public administration, health, and finance sectors, reflecting Barnstaple's role as a regional centre. There is also a healthy industrial base in the area, and this is reflected in the 48 prescribed processes regulated under the Pollution Prevention and Control Regulations 2000, which are currently in operation within the administrative area of North Devon Council.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM **in England** are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

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Table 1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2005
Particles (PM₁₀) (gravimetric)	50 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu\text{g}/\text{m}^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu\text{g}/\text{m}^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

1.4.1 First Round of Review And Assessment

The first round of review and assessment (carried out in 2000) concluded that:

1. the risk of exceeding the air quality objectives for Carbon monoxide, Benzene, 1,3-butadiene, Lead, Sulphur dioxide, PM10 & Nitrogen dioxide was negligible.
2. On this occasion these conclusions were dependent on a proposed gas fired power station in Yelland not being constructed. If constructed, a third stage review would have been required to consider localised exceedances of *Sulphur dioxide* and *Nitrogen dioxide*.

1.4.2 Updating and Screening Assessment

The Updating and Screening Assessment (produced in 2002/03) concluded that: -

1. the risk of exceeding the air quality objectives for Carbon monoxide, Benzene, 1,3-butadiene, Lead, Sulphur dioxide, PM10 & Nitrogen dioxide was negligible.
2. A detailed assessment was required for the 15-minute Sulphur Dioxide only arising from public exposure to idling trains at Barnstaple railway station.
3. Monitoring results for Nitrogen dioxide identified potential exceedances of the annual mean objective at several locations in Barnstaple, however these locations were likely to see significant reductions in road traffic numbers should the proposed western bypass and downstream bridge be constructed. As this was scheduled for completion by early 2006, it was considered that a detailed assessment for Nitrogen dioxide was not necessary.

1.4.3 Progress Report

The Progress Report (produced in 2005) concluded that: -

1. The findings of the 2003 Updating and Screening Assessment remain valid for Carbon monoxide, Benzene, 1,3-Butadiene, Lead and PM₁₀.
2. A Detailed Assessment is not required for the 15-minute Sulphur dioxide objective, due to changes in the timetable for trains operating from Barnstaple Station.
3. Construction of the Barnstaple Western Bypass has now commenced. The predicted reductions in road traffic in central Barnstaple are still expected to be achieved,

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however compliance with the annual mean objective for *Nitrogen dioxide* at Rolle Street is expected to be approximately 12 months later than stated in the 2003 USA.

4. There are no new industrial processes or planned developments in the North Devon District with the potential to significantly impact upon achievement of the National Air Quality Standards.

1.4.4 Updating and Screening Assessment

The Updating and Screening Assessment (produced in 2006) concluded that:

- 1 Monitoring results for Nitrogen Dioxide identified potential exceedances of the annual mean objective at several locations in Barnstaple, however these locations were likely to see significant reductions in road traffic numbers should the proposed western bypass and downstream bridge be constructed. As this was scheduled for completion by May 2007, it was considered that a detailed assessment for Nitrogen dioxide was not necessary.

1.4.5 Progress Report

The Progress Report (produced in 2007) concluded that:

- 1 The findings in the Progress Report prepared in 2007 in relation to Carbon Monoxide, Benzene, 1,3-Butadiene, Lead, Sulphur Dioxide and PM₁₀ remain valid.
- 2 It was determined that whilst 2 of the 16 sites monitored in 2006 were equal to the threshold limit for Nitrogen Dioxide, and, and 1 site exceeded the limit, a detailed assessment of Nitrogen Dioxide at these locations was not necessary at that time. The western bypass and downstream bridge project was completed in May 2007, and was forecast to have a significant effect on traffic flows in and around Barnstaple. It was stated that the effects of the completion of this project on the Nitrogen Dioxide levels at these sites would be able to be assessed during this years LAQM Progress Report.

1.4.6 Progress Report

The Progress Report (produced in 2008) concluded that:

- 1 The findings in the Progress Report prepared in 2007 in relation to Carbon Monoxide, Benzene, 1,3-Butadiene, Lead, Sulphur Dioxide and PM₁₀ remain valid.
- 2 It was determined that 3 of the 16 sites monitored in 2007 exceeded the threshold limit for Nitrogen Dioxide. It was therefore determined that a detailed assessment of Nitrogen Dioxide should be undertaken at the following sites:

Site 3	Rolle Street 2, Barnstaple
Site 12	The Square, Braunton

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Site 13

The London Inn, Braunton

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

There are no automatic monitoring sites in North Devon.

2.1.2 Non-Automatic Monitoring

Nitrogen Dioxide is measured by diffusion tube at 16 locations in the North Devon District. The monitoring programme has been in place since 2000, and the monitoring sites are identified in Table 2.

Table 2 Details of Non- Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref	Pollutants Monitored	In AQMA ?	Relevant Exposure ? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Worst-case Location?
1	Kerbside	SS 55756 BNG 33720	NO ₂	N	Y (1m)	0.5m	Y
2	Kerbside	SS 55533 BNG 33615	NO ₂	N	Y (1m)	0.5m	Y
3	Kerbside	SS 55421 BNG 33652	NO ₂	N	Y (1m)	0.5m	Y
4	Kerbside	SS 55658 BNG 32828	NO ₂	N	Y (10m)	0.5m	Y
5	Urban Background	SS 54230 BNG 32526	NO ₂	N	Y (1m)	N/A	Y
6	Kerbside	SS 53936 BNG 32409	NO ₂	N	N(100m)	0.5m	Y
7	Kerbside	SS 56716 BNG 32203	NO ₂	N	Y (1m)	0.5m	Y
8	Kerbside	SS 56671 BNG 32088	NO ₂	N	Y (1m)	0.5m	Y
9	Kerbside	SS 55559 BNG 33298	NO ₂	N	Y (1m)	0.5m	Y
10	Kerbside	SS 56130 BNG 33181	NO ₂	N	Y (3m)	0.5m	Y
11	Kerbside	SS 55764 BNG 33702	NO ₂	N	Y (1m)	0.5m	Y
12	Kerbside	SS 48896 BNG 36714	NO ₂	N	Y (1m)	0.5m	Y
13	Kerbside	SS 48731 BNG 36642	NO ₂	N	Y (1m)	0.5m	Y
14	Kerbside	SS 51544 BNG 47330	NO ₂	N	Y (1m)	0.5m	Y
15	Kerbside	SS 55704 BNG 33169	NO ₂	N	Y (1m)	0.5m	Y
16	Kerbside	SS 71426 BNG 25877	NO ₂	N	Y (1m)	0.5m	Y

2.2 Comparison of Monitoring Results with AQ Objectives

Air quality monitoring is currently undertaken for Nitrogen Dioxide only, using diffusion tubes – there is no monitoring programme for PM10, Sulphur Dioxide, or Benzene. As such Nitrogen Dioxide is the only pollutant to be considered for the purpose of this section of the report.

2.2.1 Nitrogen Dioxide

The results of the diffusion tube monitoring undertaken in 2008 are shown in table 3. Please note that for all sites, the diffusion tube exposed in January was not collected until

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the end of February 2008. In accordance with advice received from the air quality helpdesk in March 2009, the annual mean has therefore been calculated taking this into account, and using this result as the result for January and February combined.

The bias adjustment factor applied to the annual mean concentration was 0.92, as calculated from the spreadsheet available at www.airquality.co.uk, inputting "Gradko" as the analysing laboratory, "20% TEA in water" for the preparation, and 2008 for the year.

The measured bias adjusted annual mean concentration for 2008 is greater than 40 µg/m³ at sites 12 and 13. The results of previous monitoring undertaken resulted in a detailed assessment being commenced at these sites in March 2009, the results of which shall be reported in April 2010.

Whilst sites 12 and 13 are the only sites to exceed 40 µg/m³ for 2008, it is interesting to note that as a result of previous monitoring undertaken, a detailed assessment was also commenced in March 2009 for site 3. The results for monitoring undertaken in 2008 suggest does not suggest an exceedance of the threshold at this site, however the detailed assessment shall be completed, and the subsequent results reported in April 2010.

Diffusion Tube Monitoring Data

Table 3 Results of Nitrogen Dioxide Diffusion Tubes - 2008

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations 2008 (µg/m ³) Adjusted for bias
1	Pilton Causeway, Barnstaple	N	83	30.49
2	Rolle Street 1, Barnstaple	N	83	30.89
3	Rolle Street 2, Barnstaple	N	100	35.67
4	Lower Sticklepath Roundabout, Barnstaple	N	100	22.95
5	Sticklepath School, Barnstaple	N	75	5.29
6	Cedars Roundabout, Barnstaple	N	100	19.56
7	Newport Road, Barnstaple	N	100	32.34
8	South Street, Newport, Barnstaple	N	100	23.92
9	Castle Street, Barnstaple	N	100	15.63
10	Alexandra Road, Barnstaple	N	92	32.92
11	Belle Meadow Road, Barnstaple	N	100	29.38
12	The Square, Braunton	N	100	44.08
13	The London Inn, Braunton	N	100	45.44
14	Church Street, Ilfracombe	N	92	23.19
15	High Street, Ilfracombe	N	100	21.15
16	Broad Street, South Molton	N	100	21.91

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Table 4 Results of Nitrogen Dioxide Diffusion Tubes – 2006 to 2008

Site ID	Location	Within AQM?	Annual mean concentrations ($\mu\text{g}/\text{m}^3$) Adjusted for bias		
			2006 *	2007 *	2008
1	Pilton Causeway, Barnstaple	N	34.10	30.47	30.49
2	Rolle Street 1, Barnstaple	N	29.47	37.03	30.89
3	Rolle Street 2, Barnstaple	N	44.99	41.45	35.67
4	Lower Sticklepath Roundabout, Barnstaple	N	23.21	25.36	22.95
5	Sticklepath School, Barnstaple	N	7.94	10.42	5.29
6	Cedars Roundabout, Barnstaple	N	20.78	19.11	19.56
7	Newport Road, Barnstaple	N	33.79	34.03	32.34
8	South Street, Newport, Barnstaple	N	26.93	27.79	23.92
9	Castle Street, Barnstaple	N	40.03	24.34	15.63
10	Alexandra Road, Barnstaple	N	32.70	34.39	32.92
11	Belle Meadow Road, Barnstaple	N	25.67	33.43	29.38
12	The Square, Braunton	N	35.54	41.72	44.08
13	The London Inn, Braunton	N	40.40	42.87	45.44
14	Church Street, Ilfracombe	N	22.77	23.76	23.19
15	High Street, Ilfracombe	N	22.85	29.30	21.15
16	Broad Street, South Molton	N	24.09	23.98	21.91

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

North Devon Council confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

North Devon Council confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

North Devon Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

North Devon Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since The Last Round of Review and Assessment

North Devon Council has assessed new/newly identified junctions meeting the criteria in Section A.5 of Box 5.3 in TG(09), and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with Significantly Changed Traffic Flows

North Devon Council has assessed new/newly identified roads with significantly changed traffic flows, and concluded that it will be necessary to proceed to a Detailed Assessment.

Please note that "The Western Bypass and Downstream Bridge" as identified in previous reports was completed in May 2007. The effects of the completion of this project on Nitrogen Dioxide Levels for sites which have consequently experienced a significant change in traffic flows were assessed in the Progress Report for 2007, and resulted in a

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detailed assessment being commenced in March 2009 for Nitrogen Dioxide for 3 sites, including "Rolle Street 2". The results of this DA are currently scheduled to be reported in April 2010.

3.7 Bus and Coach Stations

North Devon Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

North Devon Council confirms that there are no major passenger or freight airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

North Devon Council confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

North Devon Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

North Devon Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

North Devon Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.1.2 Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been Introduced

North Devon Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

North Devon Council has assessed new/proposed industrial installations, and concluded that it will not be necessary to proceed to a Detailed Assessment..

In 2008, a permit to operate was issued to a non ferrous foundry process under the Environmental Permitting Regulations (2007) England and Wales. Consideration of the location of the installation has confirmed that there is no relevant exposure. As emissions from this installation (particulate matter, hydrogen fluoride and hydrogen chloride), are regulated in accordance with permit conditions, which includes a requirement for daily emission checks in addition to annual stack emissions monitoring, North Devon Council does not consider it necessary to proceed to a detailed assessment.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

North Devon Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

North Devon Council confirms that there are no poultry farms meeting the specified

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criteria.

Whilst 1 poultry farm has been identified in North Devon, information obtained from the Environment Agency confirms that this farm does not meet the specified criteria in Technical Guidance LAQM.TG (09).

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

North Devon Council confirms that there are no biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

North Devon Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

North Devon Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

There are 3 operational quarries in the North Devon District, all with associated stockpiles, but none with relevant exposure.

Regular inspections of all sites are undertaken in accordance with the Environmental Permitting Regulations 2007, and as such no concerns have been highlighted in relation to dust emissions from these sites that may lead to a breach of the concentration limit.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The measured bias adjusted annual mean concentration of Nitrogen Dioxide for 2008 is greater than $40 \mu\text{g}/\text{m}^3$ at sites 12 and 13 as can be seen in 2.2.1. The results of previous monitoring undertaken has resulted in a detailed assessment being commenced at these sites in March 2009, the results of which shall be reported in April 2010.

Whilst sites 12 and 13 are the only sites to exceed $40 \mu\text{g}/\text{m}^3$ for 2008, it is interesting to note that as a result of previous monitoring undertaken, a detailed assessment was also commenced in March 2009 for site 3. The results for monitoring undertaken in 2008 suggest does not suggest an exceedance of the threshold at this site, however the detailed assessment shall be completed, and the subsequent results reported in April 2010.

8.2 Conclusions from Assessment of Sources

North Devon Council confirms that there are no road traffic sources that have not been adequately considered in previous rounds of Review and Assessment, as can be shown in 3.0.

North Devon Council confirms that there are no other transport sources that have not been adequately considered in previous rounds of Review and Assessment, as can be shown in 4.0.

North Devon Council confirms that there are no industrial sources that have not been adequately considered in previous rounds of Review and Assessment, as can be shown in 5.0.

North Devon Council confirms that there are no commercial and domestic sources that have not been adequately considered in previous rounds of Review and Assessment, as can be shown in 6.0.

North Devon Council confirms that there are no fugitive or uncontrolled sources that have not been adequately considered in previous rounds of Review and Assessment, as can be shown in 7.0.

8.3 Proposed Actions

A detailed assessment of Nitrogen Dioxide is currently being undertaken at sites 2, 12 and 13, the results of which shall be reported in April 2010.

Please refer to section 2.2.1 for further details of the monitoring data which has determined this to be necessary.

References

"Local Air Quality Management - Technical Guidance LAQM.TG(09)", Department for Environment, Food and Rural Affairs, London, 2009.

Appendices

Appendix A: QA/QC Data

Appendix B: Map showing Diffusion Tube Locations

Appendix A:

QA/QC Data

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Diffusion Tubes are supplied and analysed by Gradko Laboratories, using a 20% TEA in water preparation.

The bias adjustment factor applied to the annual mean concentration was 0.92, as calculated from the spreadsheet available at www.airquality.co.uk, inputting "Gradko" as the analysing laboratory, "20% TEA in water" for the preparation, and 2008 for the year.

QA/QC of diffusion tube monitoring

Gradko Laboratories' internal analysis procedures are assessed annually by UKAS, to confirm compliance with ISO 17025.

Furthermore, Gradko's NO₂ diffusion tube procedures have been amended to follow the guidelines of the DEFRA Harmonisation document related to the preparation, extraction, analysis and calculation procedures for NO₂ passive diffusion tubes.

Appendix B

**Map showing approximate diffusion tube
locations**

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