

2015 Updating and Screening Assessment for Broadland District Council

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

April 2015

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Executive Summary

This report fulfils the requirements of the Local Air Quality Management process as set out in the 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.

This document is Broadland District Council's sixth round Updating and Screening Assessment. Results from monitoring by the Council are presented and sources of air pollution are identified. The Updating and Screening Assessment determines those changes since the last assessment which could lead to the risk of an air quality objective being exceeded.

Little has changed in terms of the sources of emissions in the Broadland since the fifth round Updating and Screening Assessment was undertaken in 2009. This assessment determines that no further Detailed Assessments are necessary in Broadland at this time.

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1 Introduction

1.1 Description of Local Authority Area

Broadland is located in Norfolk and includes the Northern suburbs of Norwich and the rural areas to the north and east of the city – covering an area of 55,215 hectares (552km²) and a population of about 120,000. Lying partly within the east of Broadland is the Norfolk Broads National Park, with some two hundred km of navigable waterways. District Council's bordering Broadland are Great Yarmouth, South Norfolk, North Norfolk and Breckland.

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.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

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 1.1. 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).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM 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 (PM_{10}) (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

In the first round of Review and Assessment process, Broadland District Council carried out a Stage 3 Review and Assessment for nitrogen dioxide (related to traffic

emissions) and also for sulphur dioxide (related to an industrial process). It was concluded from a detailed modelling assessment, that the nitrogen dioxide objective was unlikely to be exceeded. The sulphur dioxide objective was predicted to be exceeded, and a recommendation to declare an AQMA with associated long term monitoring was made. However, a decision was subsequently taken not to declare an AQMA as a result of confirmed measures to reduce emissions from the industrial process.

Broadland District Council carried out an Updating and Screening Assessment in 2003. It conclude that a Detailed Assessment was not required at that time, as the air quality objectives were not predicted to be exceeded; therefore a Progress Report was required in 2004. The same conclusion was reached in the Air Quality Progress Report, that air quality in the district was good, and that the air quality objectives would not be exceeded.

Broadland District Council completed their third round of Updating and Screening Assessment in April 2006. It concluded that there had been no significant changes with regard to emissions of carbon monoxide, 1,3 –butadiene, lead, nitrogen dioxide, or sulphur dioxide. Therefore a Detailed Assessment for these pollutants was not required at that time. In terms of particulate matter (PM_{10}), the daily mean objective was likely to be exceeded at one busy junction, the A140/A1042 junction, comprising Cromer Road (A140), Aylsham Road, Boundary Road (A140), Mile Cross Lane (A1042) and Reepham Road. Broadland was therefore required to proceed to a Detailed Review and Assessment for PM_{10} in order to further define the extent of the risk of exceedence at this location.

As there were potential PM_{10} exceedences caused by road traffic, it was considered likely that the annual mean objective for nitrogen dioxide was also at risk, and a Detailed Assessment was undertaken for both pollutants (nitrogen dioxide and PM_{10}) at the junction. The Detailed Assessment concluded that it was very likely that the nitrogen dioxide annual mean objective was exceeded in 2006, and exceedences were also predicted in 2010. However, no exceedence of the daily mean objective for PM_{10} was predicted at the junction in 2006 or 2010. As a result, it was recommended that Broadland declare an AQMA for nitrogen dioxide. Following the

Detailed Assessment, diffusion tubes were located at locations with predicted exceedences to confirm modelling results. The results were presented in the Progress Report in 2008. Monitoring at the existing 10 monitoring sites within the district indicated that no exceedence of the annual mean nitrogen dioxide objective was reported outside the proposed AQMA area. Seven new monitoring sites were set up in the proposed AQMA in March 2008, and in September 2008 Broadland declared an AQMA for nitrogen dioxide at the A140 / A1042 junction in Upper Hellesdon, Norwich.

The 2009 Updating and Screening Assessment concluded that there were no exceedences of the nitrogen dioxide objective and the Upper Hellesdon AQMA was revoked in April 2010. The Updating and Screening Assessment did, however, identify that the Haveringland Farm Poultry Unit met the criteria requiring a detailed assessment for PM₁₀. This Detailed Assessment is still pending, awaiting further information from the LAQM support helpdesk, it is understood that further research is being carried out with a view to reviewing this assessment parameter.

Nitrogen dioxide monitoring published in the 2011 and 2013 Progress Report did not identify any exceedences of the annual mean objective. The 2012 and Updating and Screening Assessment also did not identify any exceedences, but did review emissions from new biomass boilers. The 2014 Progress Report also reviewed emissions from new biomass boilers.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Non-Automatic Monitoring Sites

Broadland District Council conducted monitoring at 16 diffusion tube sites. These are spread throughout the district, including several sites in the area previously covered by the AQMA. Details of diffusion tube sites are shown in Figure 2.1 and Table 2.2. The diffusion tubes are supplied and analysed by Gradko International. Details of the QA/QC approach are given in Appendix A.

At three sites (BN5, BN10 and BN11) there was less than 75% data capture, and these results have been annualised, the details of which are shown in Appendix A.

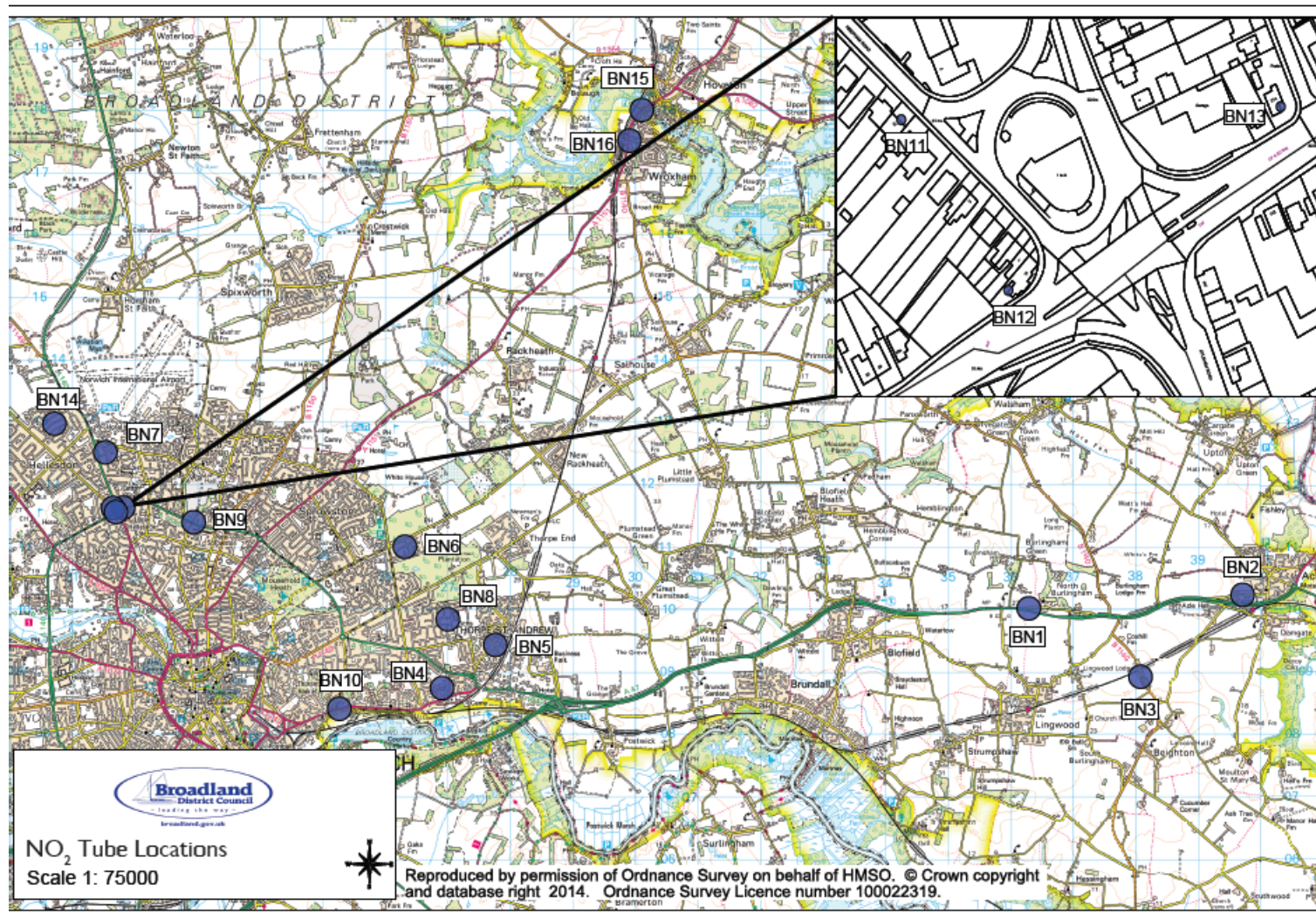


Figure 2.2 Map of Non-Automatic Monitoring Sites

Table 2.2 Details of Non-Automatic Monitoring Sites

Site ID	Site Location	Site Type	Grid Reference	Pollutants Monitored	In AQMA?	Colocated?	Relevant Exposure?	Distance to kerb?	Worst-case exposure?
BN1	A47 N Burlingham	Roadside	636268 310000	NO2	n/a	N	N (231m)	<1 m	Y
BN2	Norwich Rd, Acle	Roadside	639713 310237	NO2	n/a	N	N (24m)	<1 m	Y
BN3	Cox Hill, Beighton	Roadside	638094 308891	NO2	n/a	N	N (417m)	<1 m	Y
BN4	Hillside, Thorpe St Andrew	Roadside	626911 308738	NO2	n/a	N	Y (0m)	2 m	Y
BN5	Dussindale, Thp St Andrew	Roadside	627755 309440	NO2	n/a	N	Y (0m)	2 m	Y
BN6	Breck Rd, Sprowston	Roadside	626313 311010	NO2	n/a	N	Y (0m)	2 m	Y
BN7	Heath Crescent, Hellesdon	Roadside	621539 312522	NO2	n/a	N	Y (0m)	2 m	Y
BN8	Hansell Road	Roadside	627003 309849	NO2	n/a	N	Y (0m)	2 m	Y
BN9	Chartwell Rd, Old Catton	Roadside	622938 311399	NO2	n/a	N	Y (0m)	2 m	Y
BN10	Yarmouth Rd, Thp St Andrew	Roadside	625264 308411	NO2	n/a	N	N (76m)	2 m	Y
BN11	21 Reepham Rd, Hellesdon	Roadside	621642 311622	NO2	n/a	N	Y (0m)	8 m	Y
BN12	10A Boundary Rd, Hellesdon	Roadside	621698 311565	NO2	n/a	N	Y (0m)	6 m	Y
BN13	214 Mile Cross Ln, Hellesdon	Roadside	621811 311636	NO2	n/a	N	Y (0m)	5 m	Y
BN14	Berrington Road, Hellesdon	Roadside	621690 311758	NO2	n/a	N	Y (0m)	4 m	Y
BN15	Library Wroxham	Roadside	630182 318042	NO2	n/a	N	N (16m)	2 m	Y
BN16	The Avenues, Wroxham	Roadside	629887 317575	NO2	n/a	N	N (35m)	2 m	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

2.2.2 Automatic Monitoring Data

Automatic monitoring was not carried out in Broadland in 2014

2.2.3 Diffusion Tube Monitoring Data

The nitrogen dioxide diffusion tube monitoring data for 2014 are summarised in in Table 2.3. There were no recorded exceedences of the annual mean objective in 2014. There are a number of diffusion tube sites where the concentrations were measured for less than 75% of the year. The results for these sites have been adjusted using the procedure in box 3.2 of TG(09). Details of this adjustment are included in Appendix A. None of the results have been adjusted for distance from the carriageway. The full data set (monthly mean values) are included in Appendix B.

Table 2.3 Results of Nitrogen Dioxide Diffusion Tubes 2014

Site location	Site ID	Site Type	Colocated	Tube height(cm)	Data Capture (%)	Data annualised?	Bias adjusted results ($\mu\text{g}/\text{m}^3$)
A47 N Burlingham	BN1	Kerbside	N	209	83	N	29.5
Norwich Rd, Acle	BN2	Kerbside	N	217	83	N	20.7
Cox Hill, Beighton	BN3	Kerbside	N	220	83	N	15.8
Hillside Ave, Thorpe	BN4	Roadside	N	257	83	N	14
Dussingdale, Thorpe	BN5	Roadside	N	248	75	Y	21.7
Breck Rd, Sprowston	BN6	Roadside	N	234	83	N	13.2
Heath Crescent, Hellesdon	BN7	Roadside	N	140	83	N	14.9
Hansell Road, Thorpe	BN8	Roadside	N	232	83	N	14.7
Chartwell Road, Old Catton	BN9	Roadside	N	209	83	N	28.4
Yarmouth Rd, Thorpe	BN10	Roadside	N	282	66	Y	20.9
Reepham Rd, Hellesdon	BN11	Roadside	N	232	58	Y	32.2
10A Boundary Rd, Hellesdon	BN12	Roadside	N	203	83	N	32.1
213 Milecross Lane, Hellesdon	BN13	Roadside	N	197	83	N	24.7
Berrington Rd, Hellesdon	BN14	Roadside	N	221	83	N	16.9
Wroxham Library	BN15	Roadside	N	210	83	N	20.8
The Avenues, Wroxham	BN16	Roadside	N	210	83	N	18.3
Air quality standard		40					

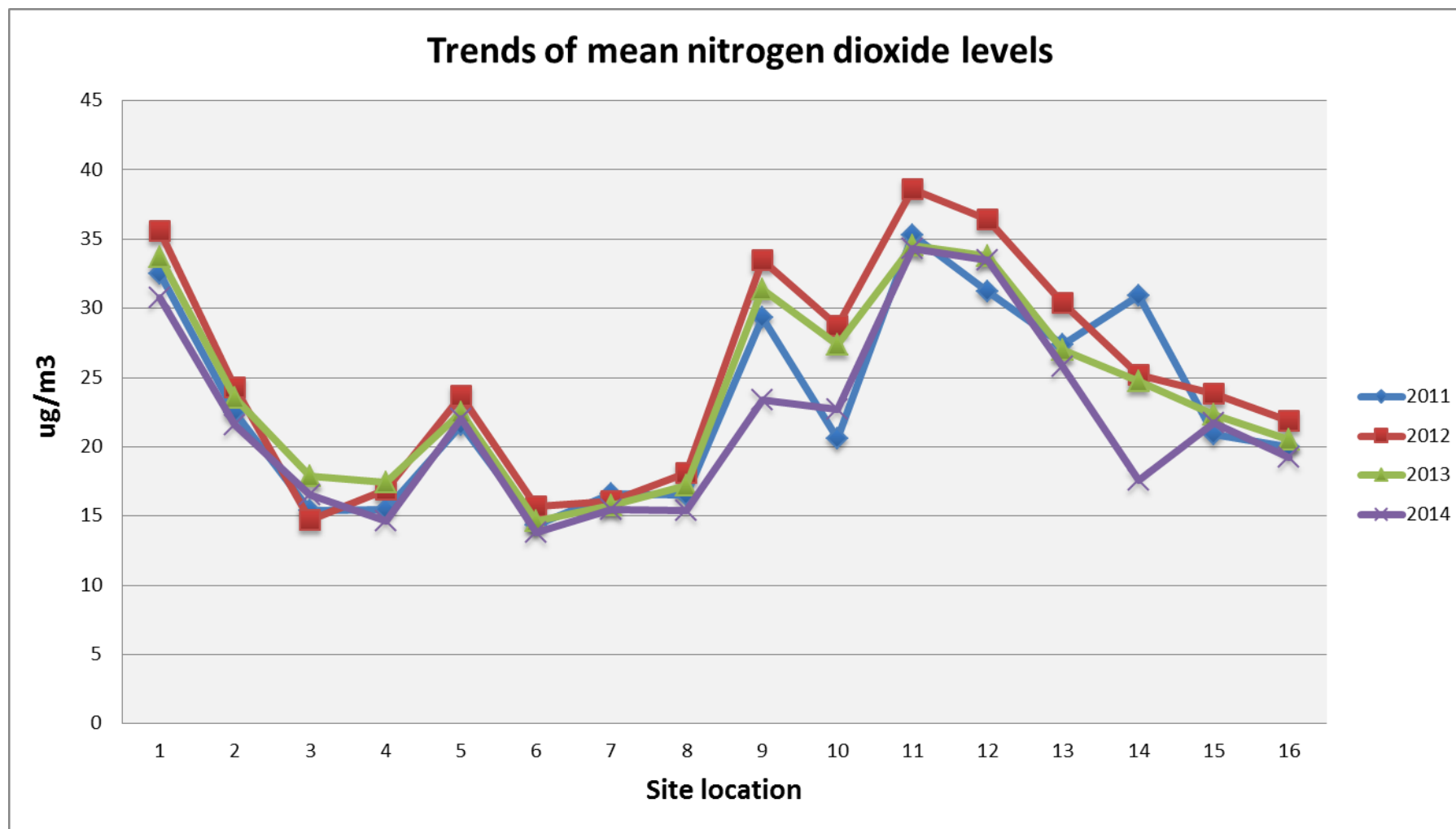
Figures in bold indicate data capture \leq
75%

Figures in bold are
annualised

Bias adjustment factor 0.91

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes (2010-2014)

Site ID	Site Type	Within AQMA?	2010 (Bias adjusted *0.75)	2011 (Bias adjusted *0.84)	2012 (Bias adjusted *0.87)	2013 (Bias adjusted *0.95)	2014 (Bias adjusted *0.91)
BN1	Kerbside	n/a	30	32.5	35.6	33.7	30.8
BN2	Kerbside	n/a	21	22.5	24.3	23.5	21.6
BN3	Kerbside	n/a	14	15.4	14.7	17.9	16.5
BN4	Roadside	n/a	15	15.5	16.9	17.4	14.6
BN5	Roadside	n/a	22	21.6	23.7	22.5	22
BN6	Roadside	n/a	15	14.3	15.7	14.6	13.8
BN7	Roadside	n/a	16	16.6	16.1	15.8	15.5
BN8	Roadside	n/a	18	16.5	18.1	17.2	15.4
BN9	Roadside	n/a	29	29.3	33.5	31.4	23.4
BN10	Roadside	n/a	20	20.6	28.7	27.4	22.7
BN11	Roadside	n/a	20	35.3	38.6	34.5	34.3
BN12	Roadside	n/a	32	31.2	36.4	33.8	33.5
BN13	Roadside	n/a	n/a	27.4	30.4	27	25.8
BN14	Roadside	n/a	n/a	30.9	25.2	24.7	17.6
BN15	Roadside	n/a	n/a	20.9	23.8	22.3	21.7
BN16	Roadside	n/a	n/a	20	21.9	20.5	19.2
Objective	40						

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentrations measured at Diffusion Tube Monitoring Sites

The trend is in general a reduction in nitrogen dioxide levels over previous years with BN9 and BN14 showing the biggest improvement over 2013 levels. BN9 - Chartwell Road is in area on the outer ring road where there is traffic queuing back from junctions at rush hour. It should be noted that due to the monitoring position becoming unavailable, BN14 changed positions in 2014 from a position on the outer ring road to a quieter street, so is not comparable to 2013 results.

The highest levels are noted at BN11- Reephams Road, this is on a radial route that queues back from a junction joining the outer ring road.

2.2.2 Summary of Compliance with AQS Objectives

Broadland Council has examined the results from monitoring in the district. Concentrations are all below the objectives, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

The criteria for assessing narrow congested streets are set out in Box 5.3, section A1 of TG(09). Narrow congested streets were considered in previous Updating and Screening Assessments and no such locations were identified.

Broadland 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

The criteria for assessing busy streets relevant for the hourly nitrogen dioxide objective are set out in Box 5.3, section A2 of (TG09). Busy streets where people may spend 1 hour or more close to the traffic were considered in the previous Updating and Screening Assessment.

Broadland 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.

The criteria for assessing roads with high flows of buses and/or HGV's are set out in Box 5.3 section A3 of TG(09). Roads with high flows of buses and/or HGV's were considered in previous Updating and Screening Assessments.

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

3.4 Junctions

The criteria for assessing junctions are set out in Box 5.3, section A4 of TG(09). Junctions were considered in detail in previous Updating and Screening Assessments and where relevant have been included in Detailed Assessments and subsequent AQMA declarations.

Broadland 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

The criteria for assessing new roads are set out in Box 5.3, section A5 of TG(09) and are unchanged from previous rounds of Review and Assessment. There have been no new roads identified within Broadland District. The planning application mentioned in the 2009 and 2012 reports for a Northern Distributor Road has been submitted and is currently being decided upon by the Planning Inspectorate. If granted permission, this road would need to be assessed.

Broadland Council confirms that there are no new roads.

3.6 Roads with Significantly Changed Traffic Flows

The criteria for assessing roads with significantly changed traffic flows are set out in Box 5.3, section A6 of TG(09). There are none within Broadland District that meet that criteria.

Broadland Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

The criteria for assessing roads with significantly changed traffic flows are set out in Box 5.3, section A7 of TG(09). Bus and Coach stations were considered in previous Updating and Screening Assessments and no such locations identified.

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

4 Other Transport Sources

4.1 Airports

Norwich Airport is immediately outside the district, just to the south of the boundary with Norwich City. The criteria for assessing airports are set out in Box 5.4, section B1 of TG(09), and airports were considered in previous Updating and Screening Assessments and no such locations were identified.

Broadland Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

The criteria for assessing stationary locomotives are set out in Box 5.4, section B2 of TG(09) (approach 1). There are no locations in Broadland where trains are stationary for 15 minutes or more, more than three times a day.

Broadland 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

The criteria for assessing moving locomotives are set out in Box 5.4, section B2 of TG(09) (approach 2). None of the rail lines listed in Table 5.1 of TG(09) pass through Broadland.

Broadland 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)

The criteria for assessing ports are set out in Box 5.4, section B3 of TG(09) and are unchanged from previous rounds of Review and Assessment. There is no shipping activity in Broadland.

Broadland 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

The criteria for assessing industrial installations are set out in Box 5.5, section C1 of TG(09). There are no new or proposed industrial installations within Broadland since the last Updating and Screening Assessment and Progress Report.

Broadland 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

None of the industrial installations identified in previous reports have substantially increased emissions and no new exposure has been introduced nearby.

Broadland 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

The criteria for assessing industrial installations are set out in Box 5.5, section C1 of TG(09).

Broadland 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.

5.2 Major Fuel (Petrol) Storage Depots

The criteria for assessing major fuel storage depots are set out in Box 5.5, section C2 of the TG (09). Major petrol storage depots were considered in previous Updating and Screening Assessments and no such locations were identified.

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

5.3 Petrol Stations

The criteria for assessing petrol stations are set out in Box 5.5, section C3 of TG(09). There are no petrol stations within Broadland that fulfil that criteria.

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

5.4 Poultry Farms

The criteria for assessing poultry farms are set out in Box 5.5, section C4 of TG(09). No new farms exceeding the relevant criteria (turkey units with greater than 100,000 birds, naturally ventilated units with greater than 200,000 birds, or mechanically ventilated units with greater than 400,000) have been identified.

Broadland Council confirms that there are no new poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

The criteria for assessing biomass combustion (individual installations) are set out in Box 5.8, section DA of TG(09). There are no new installations since the last assessment.

Broadland Council confirms that there are no new biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

The criteria for assessing biomass combustion (combined impacts) are set out in Box 5.8, section D2 of TG(09)

Broadland Council confirms that there are no new biomass combustion plant in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

The criteria for assessing domestic solid fuel burning are set out in Box 5.8, section D2 of TG(09), Broadland Council has not identified any areas where significant coal burning takes place.

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

7 Fugitive or Uncontrolled Sources

The criteria for assessing fugitive or uncontrolled sources are set out in Box 5.10, section E1 of TG(09). There are no quarries, landfill sites or other dusty operations in Broadland that have the potential to have a significant effect on PM₁₀ concentrations at residential properties.

Broadland Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

No exceedences of the objectives have been identified in Broadland's area.

8.2 Conclusions from Assessment of Sources

The Updating and Screening Assessment has not identified any significant changes in emission sources within the Broadland area. There are no new significant commercial, domestic or fugitive sources of emissions.

8.3 Proposed Actions

There is still an outstanding Detailed Assessment required for PM₁₀ at Haveringland Farm Poultry Unit, however this is on hold pending additional guidance from Defra regarding the assessment of poultry farms. This assessment is to be completed as soon as the guidance is made available.

No further Detailed Assessments are required as a result of this Updating and Screening Assessment.

The next action is a Progress Report to be completed in 2016

9 References

Broadland District Council Updating and Screening Assessments (2003, 2006, 2009, 2012)

Broadland District Council Annual Progress Report (2004, 2008, 2011, 2013)

Defra (2007) *The Air Quality Strategy for England Scotland, Wales and Northern Ireland*, Defra

Defra (2009) *Review and Assessment: Technical Guidance LAQM.TG (09)*, Defra

Appendices

Appendix A: QA/QC Data

Appendix B: Unadjusted monthly concentrations of nitrogen dioxide

Appendix A: QA/QC Data

Diffusion Tube Bias Adjustment Factors

Broadland's diffusion tubes are prepared and analysed by Gradko International using 20% TEA in water. As no automatic monitoring was undertaken in Broadland, the bias adjustment factor used in this document was derived from the latest version of the national database co-location studies (03/15) available on the LAQM support website at <http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html>. The results from this spreadsheet provided a bias adjustment factor of 0.91 for 2014.

Short-term to Long-term Data Adjustment

There were 3 diffusion tube sites with 75% or less data capture in 2014. Because there are known seasonal variations in the concentration of nitrogen dioxide, any significant gaps in data collection are likely to influence the annual mean. The data for sites 11, 10 and 5 have been annualised following the approach detailed in Box 3.2 of TG(09). Details of the calculations are shown below:

BN11					
Site	Site Type	Annual Mean	Period Mean	Ratio	Corrected Value
Lakenfields	Urban Background	14	14.1	0.99	
St Osyth	Rural Background	14	14.4	0.97	
			Average	0.98	35.4

BN10					
Site	Site Type	Annual Mean	Period Mean	Ratio	Corrected Value
Lakenfields	Urban Background	14	14.6	0.96	
St Osyth	Rural Background	14	14.8	0.95	
			Average	0.96	23

BN5					
Site	Site Type	Annual Mean	Period Mean	Ratio	Corrected Value
Lakenfields	Urban Background	14	13.67	1.02	
St Osyth	Rural Background	14	14.55	0.96	
			Average	0.99	23.9

QA/QC of Diffusion Tube Monitoring

The diffusion tubes used by Broadland are prepared and analysed by Gradko using the 20%TEA in water method. The lab has shown good precision in 2014 and their performance was deemed 100% satisfactory in the WASP scheme. Gradko follow DEFRA's "Practical Guidance" in terms of procedure, and their analysis of diffusion tubes is covered by UKAS accreditation.

Appendix B:

Monthly nitrogen dioxide concentration (not adjusted for bias or annualised) $\mu\text{g}/\text{m}^3$

Site ID	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec	Annual mean
BN1	2.66	32.07	N/A	37.01	38.04	33.39	34.24	N/A	32.03	32.57	46.09	34.99	32.39
BN2	23.06	28.92	N/A	19.5	20.26	13.41	15.99	N/A	19.83	29.96	32.12	24	22.71
BN3	19.21	16.25	N/A	23.56	13.16	10.52	11.81	N/A	14.83	15.37	32.56	15.98	17.33
BN4	19.67	17.17	N/A	15.91	11.31	7.43	9.36	N/A	12.17	15.12	23.63	22.31	15.41
BN5	25.44	N/A	N/A	24.01	18.66	16.15	19.35	N/A	21.47	24.92	31.63	26.5	23.13
BN6	18.98	17.51	N/A	8.85	10.04	6.78	8.53	N/A	11.54	15.77	24.42	22.72	14.51
BN7	22.3	21.4	N/A	10.61	10.95	6.65	9.32	N/A	22.4	15.02	23.58	20.69	16.33
BN8	19.46	17.06	N/A	16.51	10.95	6.65	9.32	N/A	22.4	15.02	23.58	20.69	16.16
BN9	35.62	36.05	N/A	26.94	27.79	25	28.02	N/A	30.6	35.02	33.36	33.83	31.22
BN10	24.63	24.46	N/A	23.51	N/A	16.36	N/A	N/A	21.03	20.8	31.93	28.81	23.94
BN11	N/A	43.03	N/A	30.91	N/A	N/A	33.12	N/A	32.75	36.89	43.72	32.62	36.15
BN12	38.06	39.76	N/A	36.91	35.21	28.37	34.07	N/A	30.85	32.7	44.5	32.02	35.25
BN13	33	35	N/A	22.23	26.34	17.51	21.1	N/A	24.57	30.35	33.65	27.53	27.13
BN14	24.9	24.06	N/A	12.64	12.36	8.29	11.31	N/A	14.52	21.71	30.23	25.67	18.57
BN15	26.34	24.65	N/A	25.85	20.26	17.63	19.32	N/A	20.28	20.76	33.14	20	22.82
BN16	24.25	24.38	N/A	16.98	16.15	13.62	16.33	N/A	19.72	19.11	25.13	25.9	20.16