



2011 Air Quality Progress Report for Arun District Council

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

April 2011

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Executive Summary

Under the Environment Act 1995, local authorities are required to Review and Assess (R&A) air quality on a regular basis. A *review* of air quality means a consideration of the levels of pollutants in the air for which objectives are prescribed in Regulations¹, and estimations of likely future levels. An *assessment* of air quality is the consideration of whether estimated levels for the relevant future period are likely to exceed the levels set in the objectives.

The first review and assessment round was completed in 2003. The main conclusion was that the national air quality objectives were not likely to be exceeded at any location in Arun District.

This first round of R&A constitutes a benchmark against which Arun District Council can measure future progress in making improvements to the local air quality.

Guidance issued by the Department for Environment, Food and Rural Affairs (DEFRA) requires those local authorities, who found no exceedance of the air quality objectives in the last Updating and Screening Assessments (USA), to undertake a Progress Report (PR) of local air quality by the end of April 2010, and a further Progress Report (PR) by the end of April 2011.

This Progress Report identifies those aspects that have changed since the last round of review and assessment, the USA and PR. The report concentrates on the progress on implementing local air quality management and achieving or maintaining concentrations below the air quality objectives. These aims are demonstrated by reporting on updated monitoring data and new local developments that might affect air quality.

The Progress Report provides a summary of all available monitoring data, indicating monitored pollutants and specific locations within Arun District.

It is concluded that air quality objectives were not exceeded in 2009, nor is there a risk of exceedance in 2010 or 2011, Arun District Council will not therefore be required to undertake any Detailed Assessments of air quality in 2012.

Arun District Council will carry out a further LAQM Updating and Screening Assessment in 2012.

¹ Air Quality Regulations for England (2000; Amendment Regulations 2002)

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They are not intended to be as detailed as Updating and Screening Assessment Reports, or to require as much effort. However, if the Progress Report identifies the risk of exceedence of an Air Quality Objective, the Local Authority (LA) should undertake a Detailed Assessment immediately, and not wait until the next round of Review and Assessment.

1.3 Air Quality Objectives

The air quality objectives applicable to Local Air Quality Management (LAQM) in **England** are set out in the Air Quality (England) Regulations 2000 (SI 928), and the Air Quality (England) (Amendment) Regulations 2002 (SI 3043). They are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (for carbon monoxide the units used are milligrammes per cubic metre, mg/m^3). Table 1.1. includes the number of permitted exceedences in any given year (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of Local Air Quality Management in England.

Pollutant	Concentration	Measured as	Date to be achieved by
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

Stage I, II and III

Arun District Council completed its stage I assessment in December 1998 and identified a number of pollutant sources within the district requiring further assessment. Further stage II and III assessments followed.

Road sources

Advanced modelling was undertaken using the BREEZE ROADS model which incorporates emissions, traffic and meteorological data and provides estimates for both moving and idling vehicles. Predicted NO_2 concentrations for 2005 were found to be less than the required air quality objective, **so it was not necessary to declare an Air Quality Management Area (AQMA).**

Industrial sources

The contribution of SO_2 and PM_{10} from the Tarmac (Southern) Ltd., (previously Lafarge Redland Ltd.), Roadstone Coating Plant stack in Littlehampton was estimated using the GSS Environment Agency model, incorporating geographical and engineering data. When this value was added to the predicted background concentration, the total SO_2 concentration for 2004/2005 was found to be below the air quality objectives set for SO_2 . Therefore no further assessment was needed. However, for PM_{10} the predicted total 2004 concentration was found to be within 5 mg/m^3 of the annual mean air quality objective, so advanced modelling was undertaken to confirm whether the objective would be met by 2004. The advanced AERMOD model results were of similar concentration to those from the GSS model and therefore it was decided not to proceed further.

To conclude, all areas identified as being of possible concern from the Stage I review and assessment were predicted to meet the necessary air quality objectives by the target year. **Therefore, it was not necessary for this authority to declare any Air Quality Management Areas within the Arun District.**

2003 Updating and Screening Assessment

In 2003, an Updating and Screening Assessment (USA) was undertaken to account for changes to air quality objectives, monitoring data and pollutant sources since the Review and Assessment. The USA did not identify any changes to local air quality

which would lead to a risk of any of the air quality objectives being exceeded. **Therefore no further detailed assessment was required.**

2004 Progress Report

The 2004 Progress Report identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

2005 Progress Report

The 2005 Progress Report identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

2006 Updating and Screening Assessment

The 2006 Updating and Screening Assessment (USA) was undertaken to review air quality and identify new likely sources of pollution in the district. The assessment included looking at further data from the monitoring sites, assessments for congested roads, junctions, busy streets, roads with high HGV and bus volumes, as well as new roads, bus stations, new and changed emissions from industrial sources.

The 2006 USA did not identify any changes to local air quality which would lead to a risk of any of the air quality objectives being exceeded. **Therefore no further detailed assessment was required.**

2007 Progress Report

The 2007 Progress Report provided a summary of all available monitoring data, indicating monitored pollutants and specific locations within Arun District. It identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

2008 Progress Report

The 2008 Progress Report identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

2009 Updating and Screening Assessment

The 2009 Updating and Screening Assessment (USA) reviewed data on measurements of air pollutants in the district and compared these to the national air quality objectives for human health. In addition the report reviewed any new or existing potential sources of pollution and has assessed their potential impacts on air quality for the citizens of the district.

The 2009 USA did not identify any changes to local air quality which would lead to a risk of any of the air quality objectives being exceeded. **Therefore no further detailed assessment was required.**

2010 Progress Report

The 2010 Progress Report identified no further locations where air quality objectives were likely to be exceeded within Arun District. **Therefore no further detailed assessment was required.**

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

Arun District Council has no automatic monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

Monitoring of air quality across Sussex.

Arun District Council is a member of the Sussex Air Quality Partnership (Sussex Air) which benefits from the co-ordinated monitoring of air pollutants across the region. The Sussex Air Quality Monitoring Network is managed and co-ordinated by King's College London ERG, on behalf of Sussex-air and they provide data calibration and ratification of results.

Table 2.1: Sussex air quality monitoring stations and pollutants monitored (2010).

	Authority	Location	Pollutant
1	Adur	Shoreham High St	NOx
2	Brighton & Hove/AURN	Hove Roadside	NOx, O3 ,
3	Brighton & Hove CC	Beaconsfield Road (MAQMU)	NOx, PM10 (Teom)
4	Brighton & Hove CC	Stanmer Park	O3
5	Chichester D.C.	A27 Ring Road	NOx. O3, PM10(grav)
6	Chichester D.C.	Lodsworth	NOx, O3, PM10
7	Chichester D.C.	Orchard Street, Chichester	NOx
8	Crawley B.C.	East Gatwick	NOx
9	Eastbourne B.C.	Devonshire Park	NOx, O3, PM10
10	Eastbourne/AURN	Willingdon Trees	NOx, PM10, PM2.5
11	Hastings B.C.	Bulverhythe (A259)	NOx, PM10
12	Hastings B.C.	Freshfields (A259)	NOx, PM10
13	Horsham D.C.	Park Way, Horsham	NOx, PM10
14	Horsham/AURN	Storrington	NOx, PM10, PM2.5
15	Lewes D.C.	Telscombe Cliffs, Newhaven	NOx, O3, PM10, PM2.5
16	Lewes D.C.	Fisher Street, Lewes	NOx, PM10
17	Rother D.C.	Rye Harbour	O3
18	Rother D.C.	Bexhill (A259)	NOx, PM10
19	Worthing B.C.	Grove Lodge, A27	NOx
20	Wealden D.C.	Isfield	O3
21	WSCC/Sussex Air.	Mobile AQMS	PM10, NOx,O3, CO
22	DEFRA - AURN	Preston Park, Brighton	NOx, O3, PM2.5(partisol)
23	DEFRA - AURN	Lullington Heath, Wealden	NOx, O3, SO2

Key:

CO	-	carbon monoxide
NO _x	-	oxides of nitrogen (includes NO ₂ nitrogen dioxide)
O ₃	-	ozone
PM ₁₀	-	particles less than 10 microns
PM _{2.5}	-	particles less than 2.5 microns
SO ₂	-	sulphur dioxide

2.1.2 Non-Automatic Monitoring

Arun District Council undertakes monitoring with non-automatic methods using nitrogen dioxide (NO₂) diffusion tubes in various locations across the district. There are no AQMA's in Arun District. Site location maps are provided in Appendix B: Location Maps.

Table 2.2 Details of Non- Automatic Monitoring Sites

Site Name	Local	Site Type	OS Grid Ref	NO ₂	Relevant Exposure ?	Distance to kerb of nearest road	Worst-case Location?
BR High Street	Bognor	Urban Roadside	X 493778 Y 099135	NO ₂	No	1m	N
Church Lane	Bognor	Urban Backgrd	X 493429 Y 100381	NO ₂	No	N/A	Y
Mornington Crescent	Bognor	Urban Backgrd	X 495328 Y 100344	NO ₂	No	N/A	N
Canada Grove	Bognor	Urban Roadside	X 493313 Y 099228	NO ₂	No	1 m	Y
Terminus Road	Little'ton	Urban Roadside	X 502564 Y 102149	NO ₂	No	1 m	Y
Worthing Road	Little'ton	Urban Roadside	X 503439 Y 103364	NO ₂	No	1 m	Y
Thatchway Close	Little'ton	Urban Backgrd	X 502559 Y 102888	NO ₂	No	N/A	N
Westlands	Little'ton	Urban Backgrd	X 504380 Y 102687	NO ₂	No	N/A	N
Arundel High Street	Arundel	Urban Roadside	X 501825 Y 107165	NO ₂	No	1 m	N
The Causeway	Arundel	Rural Roadside	X 502337 Y 106555	NO ₂	Yes (8 m)	1 m	Y
King Street	Arundel	Urban Backgrd	X 501478 Y 107052	NO ₂	No	N/A	N
Priory Road	Arundel	Urban Backgrd	X 500886 Y 106491	NO ₂	No	N/A	N
Felpham Way	Bognor	Urban Roadside	X 495750 Y 100200	NO ₂	Yes (9.5m)	1.35m	Y
The Causeway 2	Arundel	Rural Roadside	X 502337 Y 106555	NO ₂	Yes (8 m)	1 m	Y

Key:

Little'ton - Littlehampton

Arun District Council sub-contracts the supply and analysis of the NO₂ diffusion tubes with South Yorkshire Laboratory (now South Yorkshire Air Quality Samplers – SYAQS).

The NO₂ tube preparation method used is 50% triethanolamine (TEA) in acetone.

The South Yorkshire Laboratory was on the working group and follows the procedures set out in the Harmonisation Practical Guidance.

No co-location study has been undertaken in the district or in a neighbouring authority.

Data from the NO₂ diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location data-base as collated by DEFRA Local Air Quality Management Helpdesk.

http://laqm.defra.gov.uk/documents/Diffusion_Tube_Bias_Factors_v03_11.xls

The bias adjustment factor for the South Yorkshire Laboratory (SYAQS) in 2010 is 0.92.

South Yorkshire Air Quality Samplers participate in the Workplace Analysis Scheme for Proficiency (WASP) and for the period April 2009 – April 2010, received a “Good” rating under the old criteria and an “Acceptable” rating under the new criteria.

2.2 Comparison of Monitoring Results with Air Quality Objectives

Arun District Council monitoring results have shown that there has been no measured exceedance of the UK air quality objectives in 2010.

2.2.1 Nitrogen Dioxide

Arun District Council measures nitrogen dioxide using diffusion tubes to provide annual averaged (bias corrected) concentrations within the district.

No (diffusion tube) measured location in the district, exceeded the annual mean concentration limit of 40 µg/m³ in 2010. One location (The Causeway, Arundel) has marginally exceeded the limit in previous years and was again close to the limit. The measurement location is adjacent (within 1.0m) of the kerb A27. There is a relevant location of exposure (a house) a further 8.0m away from the road. This represents the likely highest closest relevant exposure location in the district.

This location has two (duplicate) co-located nitrogen dioxide diffusion tubes. The averaged annual measured concentration for both diffusion tubes at the Causeway is 39.0µg/m³, before the recalculation back to the closest location of relevant public exposure. When the measured concentration was re-calculated back to the closest location of relevant public exposure, the result of this calculation showed an annual mean concentration of 29.9µg/m³.

A further location (A259, Felpham Way, Bognor Regis) is marginally below the annual mean concentration limit at 38.2µg/m³, and the trend over the last three years shows a steady increase. The nearest relevant location of exposure in the vicinity of the diffusion tube is a 9.5m away from the road. When the measured concentration is recalculated back to the closest location of relevant public exposure, the result of this calculation showed an annual mean concentration of 30.4µg/m³.

(The methodology used to calculate the fall-off in nitrogen dioxide concentrations with distance from the road is taken from TG09 Box 2.3, the on-line calculator at <http://laqm.defra.gov.uk/documents/NO2withDistancefromRoadsCalculatorIssue4.xls>, was used, see Appendix C for input data and graphs of reduction of NO₂ with distance from roadside).

Automatic Monitoring Data

Arun District Council has no automatic monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

Diffusion Tube Monitoring Data

Arun District Council measured nitrogen dioxide concentrations at fourteen locations across the district, including one duplicate monitoring site (The Causeway, Arundel).

All measurements are bias adjusted.

There are no AQMA's in the district.

Table 2.3 Results of nitrogen dioxide diffusion tubes

Site ID	Location	Within AQMA?	Data Capture 2010 %	Annual mean concentrations($\mu\text{g}/\text{m}^3$) Adjusted for bias		
				2008	2009	2010
BR High Street	Bognor	No	100	29.9	26.6	32.0
Church Lane	Bognor	No	100	18.4	18.0	19.5
Mornington Crescent	Bognor	No	92	16.3	17.6	19.4
Canada Grove	Bognor	No	100	26.6	24.2	26.1
Terminus Road	Littlehampton	No	100	28.4	24.6	26.1
Worthing Road	Littlehampton	No	100	31.2	37.1	29.7
Thatchway Close	Littlehampton	No	92	17.3	16.9	15.1
Westlands	Littlehampton	No	92	19.2	17.7	17.3
Arundel High Street	Arundel	No	100	21.8	20.2	22.9
The Causeway	Arundel	No	100	40.1	39.5	38.2
King Street	Arundel	No	100	19.5	18.8	17.3
Priory Road	Arundel	No	92	14.8	12.4	17.5
Felpham Way	Bognor	No	100	35.9	36.9	38.2
The Causeway 2	Arundel	No	100	36.6	38.3	39.7

Figure 2. Annual Results of Background nitrogen dioxide Diffusion Tube Sites (2003 -2010)

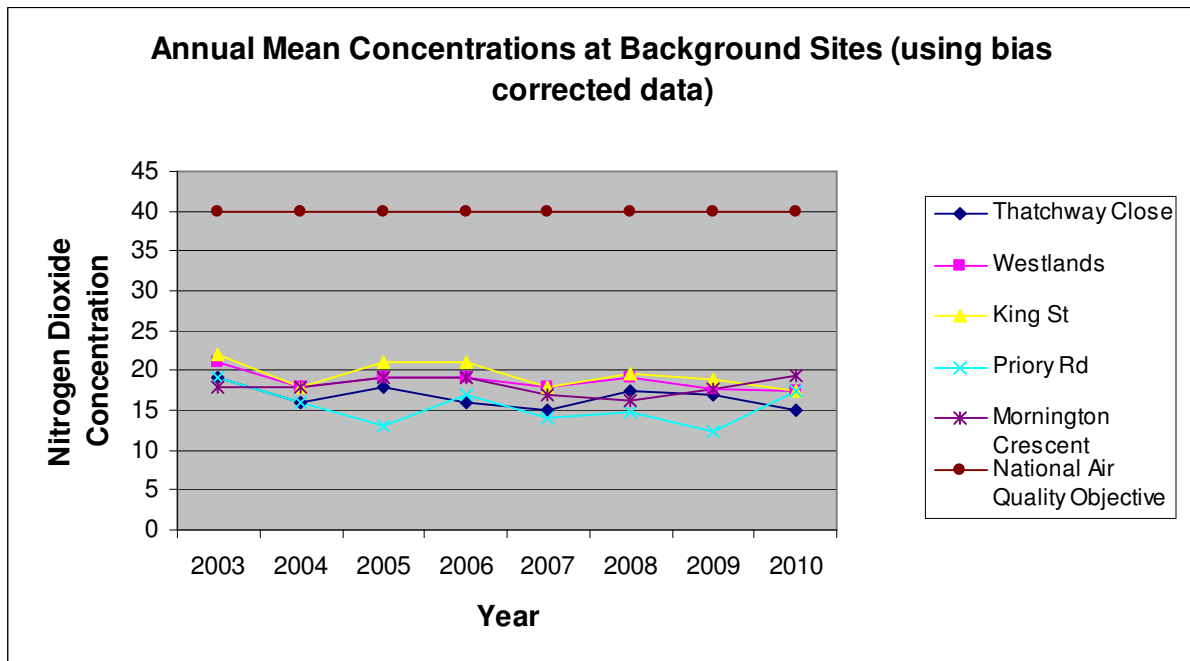
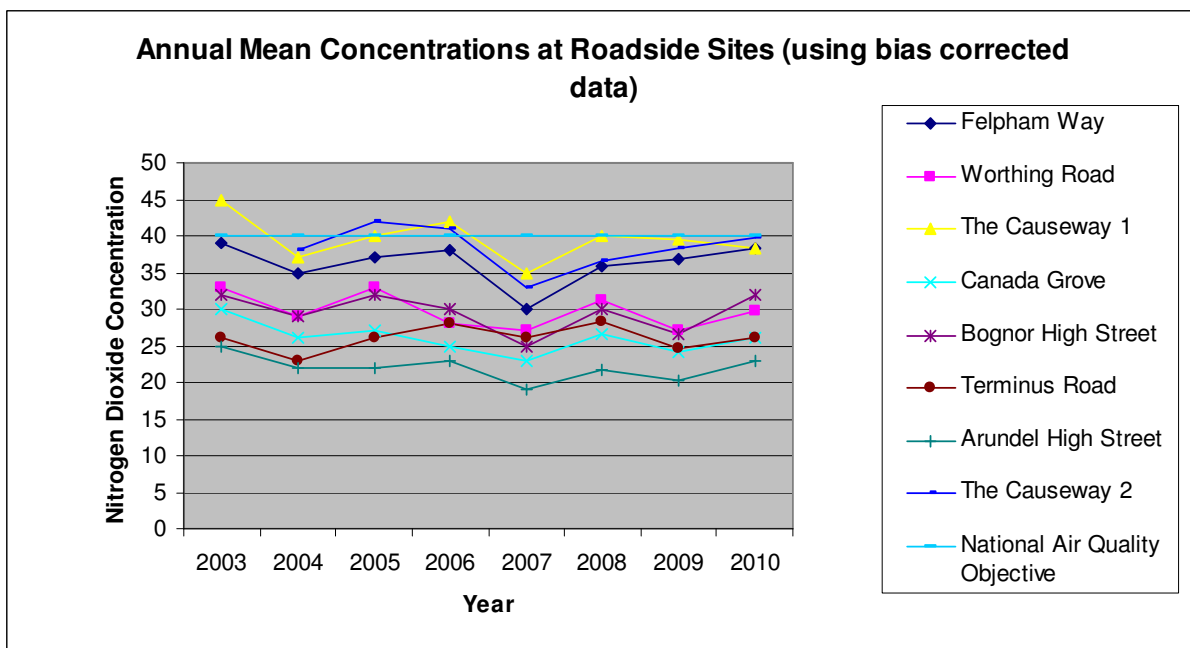


Figure 3. Annual Results of Roadside nitrogen dioxide Diffusion Tube Sites (2003 -2010)



2.2.2 PM₁₀

Arun District Council has no particulate monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

2.2.3 Sulphur Dioxide

Arun District Council has no sulphur dioxide monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

2.2.4 Benzene

Arun District Council has no benzene monitoring sites within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

2.2.5 Other pollutants monitored

Arun District Council has no other monitoring sites or monitors within its boundaries and has not closed any since the last Review and Assessment of Air Quality (2009).

2.2.6 Summary of Compliance with AQS Objectives

Arun District 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 New Local Developments

Bognor Regis has a number of major development schemes (policy Site 6) in the construction stage whose impacts on Air Quality were explored in the 2009 Update and Screening Assessment. An Environmental Impact Assessment carried out as part of the planning application for the main housing development and the Bognor Regis relief road concluded that “no exceedance of the Air Quality Strategy objectives will occur at existing potentially sensitive receivers”.

Full consideration of any impacts on Air Quality will be explored in the 2012 Update and Screening Assessment.

3.1 Road Traffic Sources

Arun District Council confirms that there are no new/newly identified road traffic sources that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Other Transport Sources

Arun District Council confirms that there are no new/newly identified non-road traffic sources that have not been adequately considered in previous rounds of Review and Assessment.

3.3 Industrial Sources

Environmental Permits have been granted in respect of an Anaerobic Digestion Facility, including a 1MWhr CHP module utilising biogas as fuel, at Barfoot Energy Ltd., Seftor Farm, Pagham, and a Small Waste Oil Burner (<0.4MW), at Hutchings Vehicle Services, 17 Durban Road, Bognor Regis. Any impacts on Air Quality will be explored in the 2012 Update and Screening Assessment.

Planning permission has been granted for part demolition and redevelopment of Littlehampton Academy including a new access road and biomass boiler (WSCC/083/10/LU). A Local Air Quality Assessment accompanied the application and concluded that “impacts from the biomass boiler and traffic on local NO₂ and PM₁₀ concentrations at locations of relevant exposure are negligible according to IAQM criteria and a low priority according to Environmental Protection UK Criteria.”

Arun District Council confirms that there are no other industrial sources that have not been adequately considered in previous rounds of Review and Assessment.

Industrial sources controlled under the Environmental Permitting (England & Wales) Regulations 2010 are listed in Appendix D.

3.4 Commercial and Domestic Sources

Arun District Council confirms that there are no new/newly identified commercial and domestic sources that have not been adequately considered in previous rounds of Review and Assessment.

3.5 New Developments with Fugitive or Uncontrolled Sources

Arun District Council confirms that there are no new/newly identified uncontrolled sources that have not been adequately considered in previous rounds of Review and Assessment.

Arun has identified the following new or previously unidentified local developments which may impact on air quality in the Local Authority area.

Bognor Regis Developments – Policy Site 6

Littlehampton Academy – access road & biomass boiler

Barfoot Energy Limited, Sefter Farm, Pagham

Waste Oil Burner, Hutchings Vehicle Services, Bognor Regis

These will be taken into consideration in the next Updating and Screening Assessment, scheduled for 2012.

4 Local / Regional Air Quality Strategy

Arun District Council are members of the Sussex Air Quality Partnership (Sussex Air). All agencies participating in Sussex Air Quality Steering Group have agreed to the Guiding Principle and Aims of improving air quality in Sussex.

Sussex Air has formulated The Sussex Air Quality Partnership Strategic Plan (2010 - 15) which has the following five key objectives:

1. Provide advice and support and improve the expertise and knowledge base.
2. Project development and implementation.
3. Partnership working.
4. Develop cross cutting work on health improvement, climate change, environment and transport.
5. Communicate air quality issues and initiatives in Sussex.

Sussex-Air resources to enable delivery of the above objectives include:

- A partnership Project Manager to undertake core and project related functions on behalf of Sussex-Air.
- Websites www.sussex-air.net and www.airalert.info plus air quality models and emissions inventories.

5 Planning Applications

Outline planning applications have been received for mixed use developments comprising up to 1,860 residential units, employment floor space, local facilities, combined heat and power plant, and relief road. Environmental Impact Assessments were carried out as part of the planning application and the anticipated air quality effects associated with construction and operation of the development were assessed. These concluded that the proposed developments would not bring about significant deterioration in local air quality.

Any impacts on Air Quality will be explored in the 2012 Update and Screening Assessment.

6 Air Quality Planning Policies

The Arun District Local Plan 2003 forms a statement of Arun District Council's planning policies, which will be used as a basis for decision making on planning applications. The Plan covers the period from 1996 to 2011 and its key aim is to apply the principles of sustainable development in assessing development proposals, striking the balance between the need for development and the protection of scarce resources. The Plan also serves to translate the land use elements of the Council's Community Strategy, "Our Kind of Place", into policies and proposals. The Core Strategy of the Local Development Framework is due to be published as a preferred options document for consultation in late 2010. There are a number of general policies within the current Local Plan that may affect local air quality.

POLICY GEN4 Location and Travel Demand

When considering proposals for new development, consideration will be given to the effect the proposals will have on demand for transport. Planning permission will be granted for new development, provided that:-

- (i) it is located so as to minimise the demand for travel;
- (ii) it does not materially add to existing road congestion and air pollution; and appropriate provision is made for safe and convenient access by public transport, cyclists and pedestrians.

Before granting planning permission, the Local Planning Authority will need to be satisfied that any identified potential travel problems arising from a proposal will be resolved.

POLICY GEN14 Public Transport

The Council will support the provision of comprehensive public transport services throughout the District, and encourage improvements to be made to services wherever possible. Where appropriate, new development will be required to make provision for public transport facilities.

Where new development can only take place with improvements to public transport services, or such improvements would be likely to influence desirable travel patterns, the Local Planning Authority will seek contributions towards the cost of improvements.

POLICY GEN34 Air Pollution

Development that contributes to air pollution through dust, smell, fumes, smoke, heat, radiation, gases, steam or other forms of pollution will not be permitted unless the Council decides that the health, safety and amenity of users of the site or surrounding land is not put at risk and the quality of the environment would not be damaged or put at risk.

7 Local Transport Plans and Strategies

West Sussex County Council (WSCC) is the Highways Authority for West Sussex and is responsible for all roads, other than trunk roads. WSCC published its first Local Transport Plan (LTP) in 2000 for the period from April 2001 to 2006. Its second LTP, a new ten year plan covering the period 2006 to 2016 was approved in March 2006 (LTP2).

LTP2 is the second cycle of the Local Transport Plans which transport authorities must submit to government on strategic transport planning issues related to their area. Guidance documents are provided by government and outline priorities, one of which is Air Quality, especially in relation to AQMA's.

The Plan's main objectives are to:

- Reduce congestion & pollution;
- Improve road & personal safety;
- Improve accessibility for our residents to key services;
- Improve overall quality of life in West Sussex

The LTP is designed to integrate transport planning with land use planning, health and social needs, which includes air quality. It also explains how air quality considerations are taken account of in the wider plan and in the assessment of individual transport schemes.

The strategy will impact in particular upon the transport plan objectives of reducing congestion and growth in unsustainable travel, improving air quality, reducing the impact of expected climate change and reducing the environmental impact of undertaking all aspects of transport provision and maintenance.

Key targets include:

- Continue to work closely with all councils, including those that are neighbours to West Sussex, and with the primary health care trusts, the Environment Agency, Highways Agency, Sussex and Brighton universities and the Sussex Air Quality Partnership;
- Assist district councils and surrounding counties in their air quality assessments;
- Promote the provision of alternative fuels on Garage forecourts across West Sussex, primarily LPG but also CNG, LNG, and biofuels. Look at provision of public electric recharging points if electric vehicle use is to be promoted;
- Continue with our air quality forecasting and warning system to inform the public and improve their awareness of air quality issues and less polluting means of travel;
- Consider use of Low Emission Zones (LEZs) as part of our developing policies on environmental access controls for town centres, which will be geared to local circumstances.

8 Climate Change Strategies

Arun District Council recognises that Climate Change is likely to be one of the key drivers of change within our community this century.

The Council has strategies that highlight the need for action on climate change, the environment and sustainability; these are:

- Sustainable Community Strategy for Arun 2008-2026 'Our Kind of Place'
- Carbon Management Action Plan
- Energy Efficiency Strategy 2009-2013
- Fuel Poverty Strategy 2009-2013
- Household Waste and Recycling Strategy 2008-2013
- Capital Strategy and Asset Management Plan

9 Conclusions and Proposed Actions

9.1 Conclusions from New Monitoring Data

New monitoring data for 2010 has shown that there are no areas likely to exceed the air quality objectives in Arun district.

Monitoring with NO₂ diffusion tubes at background sites (Figure 2) has shown to be consistent with the NAIE mapped background concentrations (17 µg/m³). Most locations have stayed between 15 - 20 µg/m³ over the last 5 years monitoring.

Monitoring with NO₂ diffusion tubes at roadside sites (Figure 3), since 2003 initially showed a slight decline but now levelled off to range between 20 – 40 µg/m³.

The location with the highest measured concentration, the Causeway near Arundel, did measure an exceedance of the objective at 40.1 µg/m³ in 2008. However a duplicate diffusion tube co-located to provide a more robust measurement method since 2004 measured below the NO₂ objective. The averaged annual measured concentration for both diffusion tubes at the Causeway in 2008 was 38.35µg/m³, which is below the objective. In 2010 the averaged annual measured concentration for both diffusion tubes at the Causeway was 39.0µg/m³. When the measured concentration was re-calculated back to the closest location of relevant public exposure, the result of this calculation showed an annual mean concentration of 29.9µg/m³.

A further location (A259, Felpham Way, Bognor Regis) is marginally below the annual mean concentration limit at 38.2µg/m³, and the trend over the last three years shows a steady increase. The nearest relevant location of exposure in the vicinity of the diffusion tube is 9.5m away from the road. When the measured concentration is recalculated back to the closest location of relevant public exposure, the result of this calculation showed an annual mean concentration of 30.4µg/m³.

No further Detailed Assessment required.

9.2 Conclusions relating to New Local Developments

Arun District has had no new major developments that may have an impact on local air quality.

No further Detailed Assessment required.

9.3 Proposed Actions

The Progress Report for 2010 has identified no likely measured exceedance of the air quality objectives.

Arun District Council will continue to monitor at locations which are determined to be relevant locations of exposure to air pollutants. The council will also utilise data from neighbouring authorities within the Sussex Air Quality Partnership Network and have access to the Sussex County Air Quality Laboratory for monitoring any new locations which may be determined a risk in the future.

Arun District Council will be carrying out an Updating and Screening Assessment in 2012.

10 References

- DEFRA (2009) Local Air Quality Management Technical Guidance, (LAQM .TG (09))
DEFRA (2009) Local Air Quality Management Policy Guidance, (LAQM .PG (09))
The Environment Act (1995)
The Environmental Protection Act (1990)
The Air Quality (England) Regulations 2000
The Air Quality (England)(Amendment) Regulations 2002

Appendices

Appendix A: QA/QC Data

Diffusion Tube Bias Adjustment Factors

Arun District Council utilises the national bias adjustment figures for the laboratory it contracts to supply and analyse the results.

Data from the NO₂ diffusion tubes has been compared and bias corrected to the factors produced from the UK co-location data-base as as collated by DEFRA Local Air Quality Management Helpdesk..

http://laqm.defra.gov.uk/documents/Diffusion_Tube_Bias_Factors_v03_11.xls

The NO₂ tube preparation method used is 50% triethanolamine (TEA) in acetone.

The supplier is the South York Laboratory (now South Yorkshire Air Quality Samplers)

The bias adjustment factor for the SYAQS in 2010 = 0.92

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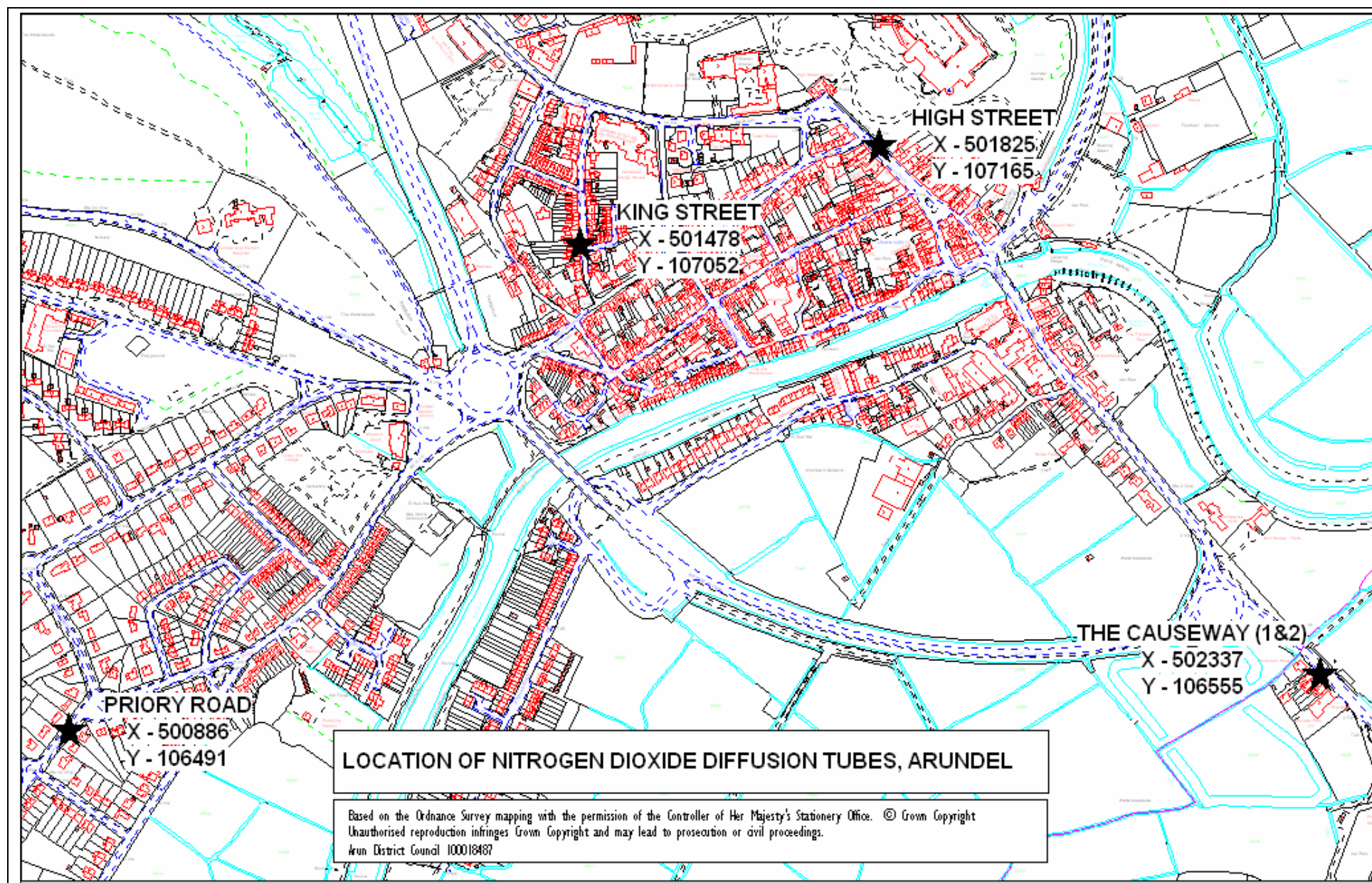
Factor from Local Co-location Studies (if available)

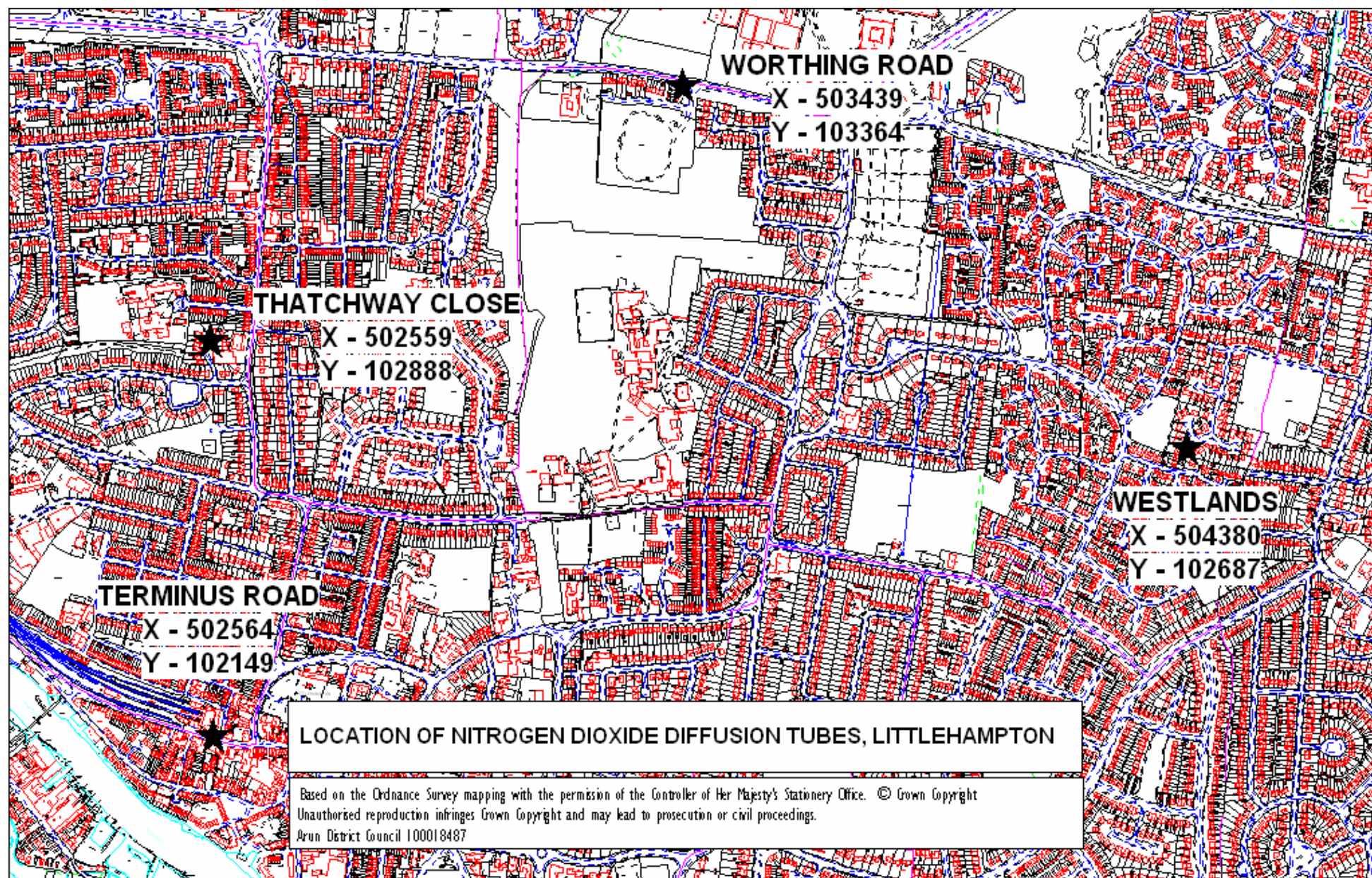
Arun District Council undertakes no co-location studies

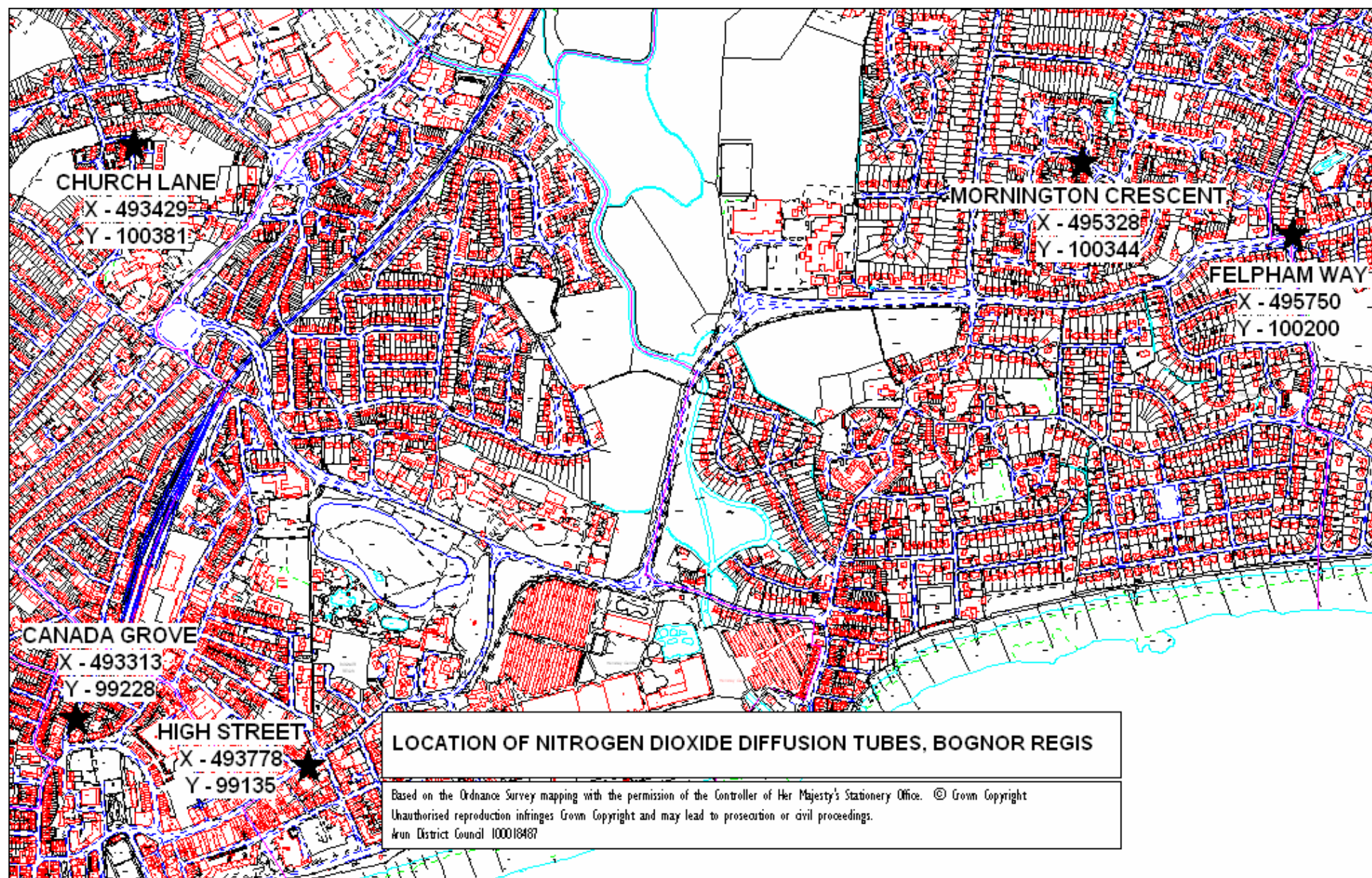
Appendix B: Location Maps

Distribution of Nitrogen Dioxide Diffusion Tubes

The location of nitrogen dioxide (NO₂) diffusion tubes in Arun District are shown on the following pages.








Appendix C: Predicting nitrogen dioxide concentrations at relevant locations.

The methodology used to calculate the fall-off in nitrogen dioxide concentrations with distance from the road is taken from TG09 Box 2.3, the on-line calculator at <http://laqm.defra.gov.uk/documents/NO2withDistancefromRoadsCalculatorIss4.xls>, was used.

Figure 4 Input data for Causeway, Arundel, roadside site.

This calculator allows you to predict the annual mean NO₂ concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.



Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	8	metres
Step 3	What is the local annual mean background NO₂ concentration (in -g/m³)?	(Note 2)	17.4	g/m ³
Step 4	What is your measured annual mean NO₂ concentration (in -g/m³)?	(Note 2)	39	g/m ³
Result	The predicted annual mean NO₂ concentration (in -g/m³) at your receptor	(Note 3)	29.9	g/m ³

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

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Figure 5 Graph of expected reduction in NO₂ from roadside, Causeway, Arundel.

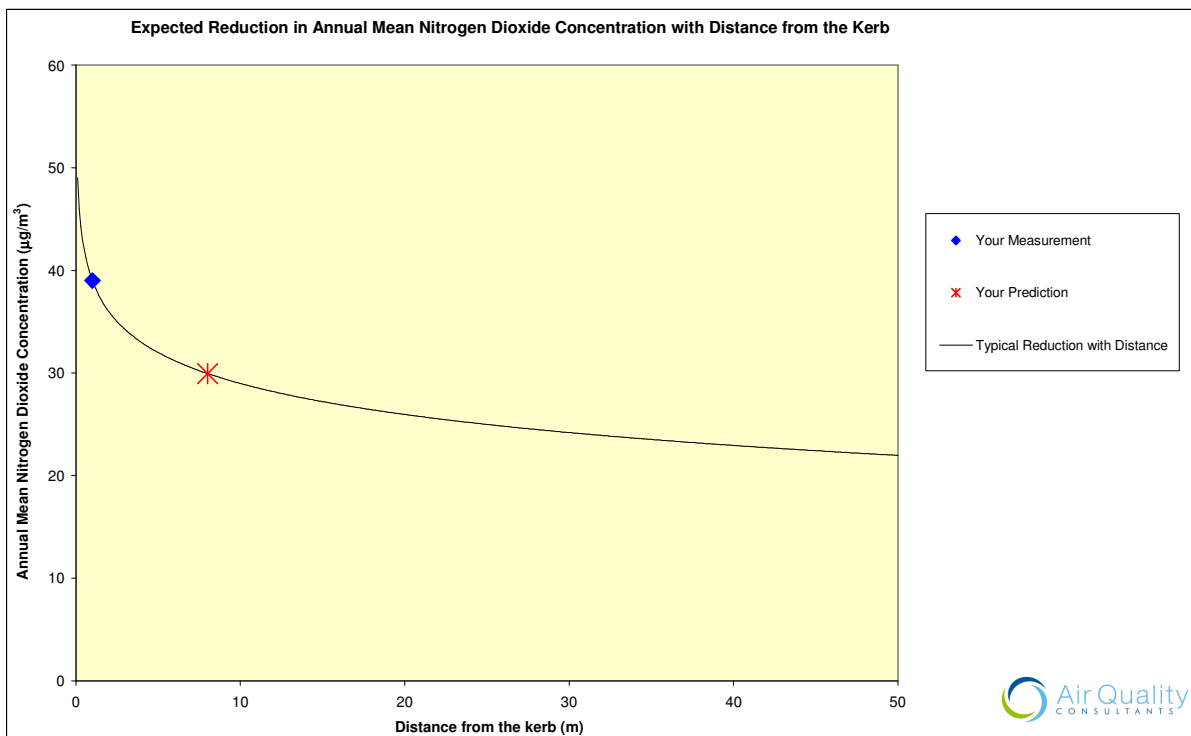


Figure 6 Input data for Felpham Way, Bognor Regis, roadside site.

This calculator allows you to predict the annual mean NO₂ concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.35	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	9.5	metres
Step 3	What is the local annual mean background NO ₂ concentration (in g/m ³)?	(Note 2)	19.5	g/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in g/m ³)?	(Note 2)	38.2	g/m ³
Result	The predicted annual mean NO ₂ concentration (in g/m ³) at your receptor	(Note 3)	30.4	g/m ³

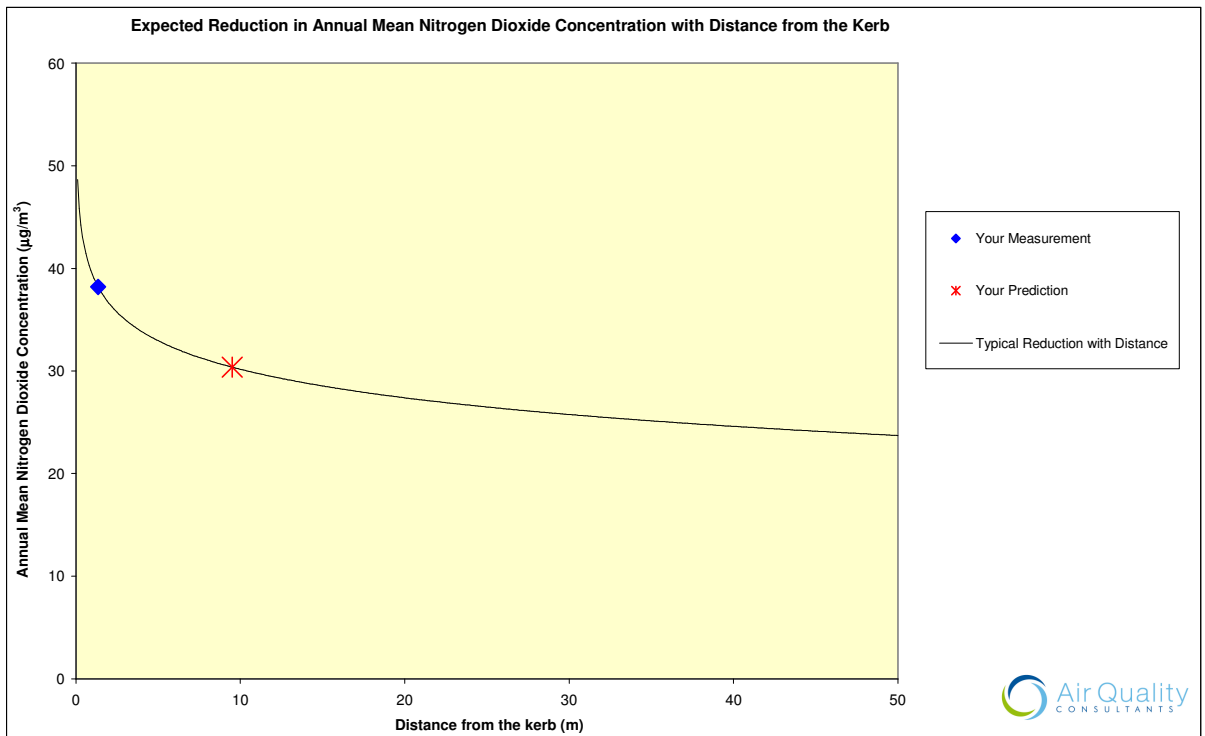
Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at <http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm> for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

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Figure 7 Graph of expected reduction in NO₂ from roadside, Felpham Way, Bognor Regis



Appendix D: Industrial Sources

Table D1: Process installations in Arun District Council

PROCESS/INSTALATION	ADDRESS OF INSTALLATION/PROCESS
Part A1	
Disposal of Waste by Landfill	Lidsey Landfill Ltd., Bognor Regis, West Sussex, PO22 9PL
Extraction, Handling and Processing of Crude Oil	Midmar Energy, Lidsey Well Site, Lidsey Road, Nr Bognor Regis, West Sussex, PO22 9PH
Sludge Drying Plant	Southern Water Services Ltd., Ford Waste Water Treatment Works, Ford, Arundel, West Sussex, BN18 0HY
Anaerobic Digestion	Barfoot Energy Ltd., Sefter Farm, Pagham, West Sussex, PO21 3PX
Waste Sterilisation	Ethos Recycling Ltd., Littlehampton Waste Treatment Plant, Unit A, Fort Road, Wick, Littlehampton, West Sussex, BN17 7QU
Part B	
Roadstone Coating Plant	Tarmac Southern Ltd., Quayside, Littlehampton, West Sussex, BN17 5DD
Cremation of human remains	The Worthing Crematorium, Horsham Road, Findon, West Sussex
Waste wood combustion	Eurotek Office Furniture Ltd, Southern Cross Trading Estate, Bognor Regis, West Sussex, PO22 9SB
Breeding of Maggots	Marine Pack Ltd., T/A National Bait Company, Lidsey Farm, Lidsey, West Sussex
Aluminum Foundry Process	Finecast Foundry Ltd, Unit 1, Lineside Way, Lineside Industrial Estate, Littlehampton, West Sussex BN17
Respraying of Road Vehicles	
Respraying of Road Vehicles	Poling Motor Company, Fordingbridge Industrial Estate, Barnham Road, Barnham, West Sussex, PO22 0HD
Small Waste Oil Burner	
Small Waste Oil Burner	Bognor Garage/J & S Motors, Shripney Road, Bognor Regis, West Sussex, PO22 9NJ
Small Waste Oil Burner	Chris Clarke Cars, Spencer Street, Bognor Regis, West Sussex, PO22 1AN
Small Waste Oil Burner	Yeomans Honda, Chichester Road, Elbridge, Chichester, West Sussex, PO21 5EH
Small Waste Oil Burner	Yeomans Honda, Chichester Road, Elbridge, Chichester, West Sussex, PO21 5EH
Small Waste Oil Burner	Marina Workshop, Littlehampton Marina, Ferry Road, Littlehampton, West Sussex, BN17 5DS
Small Waste Oil Burner	Hutchings Vehicle Services, 17 Durban Road, Bognor Regis, West Sussex, PO22 9QT
Petrol Stations	

Unloading of Petrol into Storage PVR I only	Rose Green Service Station, Hewarts Lane, Bognor Regis, West Sussex, PO21 3DS
Unloading Petrol into Storage PVR I only	Pace Petrol Filling Station, 97, Felpham Way, Bognor Regis, West Sussex, PO22
Unloading Petrol into Storage PVR I only	Pace Petrol Filling Station, Nyton Road, Westergate, Chichester, West Sussex, PO20 8QB
Unloading Petrol into Storage PVR I & II	Tesco Stores Limited, Broadpiece, Littlehampton, West Sussex, BN17 5RA
Unloading Petrol into Storage PVR I & II	Tesco Stores Limited, Shripney Road, Bognor Regis, West Sussex, PO22 9ND
Unloading Petrol into Storage PVR I & II	Shell Eastfield, Rustington Bypass, Rustington, Littlehampton, West Sussex, BN17 6LE
Unloading Petrol into Storage PVR I & II	Shell Fontwell, Arundel Rd, Fontwell, BN18 OSB
Unloading Petrol into Storage PVR I & II	Rustington Filling Station, 102, Worthing Road, Rustington, Littlehampton, West Sussex, BN16 3LS
Unloading Petrol into Storage PVR I only	Snax 24 Ltd, Lyminster Road, Lyminster, Littlehampton, West Sussex
Unloading Petrol into Storage PVR I & II	Regis Service Station, 449 Chichester Road, Bognor Regis, West Sussex, PO21 5DS
Unloading Petrol into Storage PVR I only	Cuff Miller & Co (Littlehampton) Ltd, Horsham Road, Littlehampton, BN17 6BX
Dry Cleaners	
Dry Cleaners	Sandra's Village Laundry & Dry Cleaners, 146 Sea Road, East Preston, BN16 1NN
Dry Cleaners	Colshaz Limited, T/A James Dry Cleaners, 39a Queensway, Bognor Regis, PO21 1QN
Dry Cleaners	East Preston Laundrette, 132 Downs Way, East Preston, BN16 1AF
Dry Cleaners	Johnson Cleaners UK Ltd, 166 The Street, Rustington, BN16 3DA
Dry Cleaners	Johnson Cleaners UK Ltd, 2 Central Buildings, London Road, Bognor Regis, PO21 1PW
Dry Cleaners	Kingfisher Cleaners, Shop 3 Station Parade, Station Road, East Preston BN16 3AE
Dry Cleaners	Beach Road Dry Cleaners, 4 Beach Road, Littlehampton, BN17 5HT