2009 Air Quality Updating and Screening Assessment for

South Hams District Council

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

Date (April 2009)

Local Authority Officer	Sarah Harcombe

Department	Environmental Health
Address	Follaton House, Plymouth Road, Totnes, TQ9 5NE
Telephone	01803 861164
e-mail	Sarah.harcombe@southhams.gov.uk

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Executive Summary

The report summarises all new monitoring data undertaken by South Hams District Council in 2008 for the purposes of the Air Quality Review and Assessment process.

These data include monitoring for Nitrogen Dioxide (NO_2) and particulate matter (PM)

The data indicate that annual average NO_2 levels are at, or just over, the objective for at least some receptors at Western Road, Ivybridge and along side the A385 in Totnes.. The Council is already in the process of declaring Air Quality Management Areas for these locations.

Monitoring data at the existing AQMA at Dean Prior show that the designation is still necessary for the annual average NO_2 objective and that levels there are likely to be high enough to also exceed the hourly NO_2 objective level.

Some diffusion tubes in Kingsbridge Fore Street indicated annual average NO_2 levels hovering around the objective level. This will be looked at in more detail in an additional report on this location to follow this one.

There are no new or changed sources of pollution in the district that are likely to vary existing air quality levels significantly.

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1 Introduction

1.1 Description of Local Authority Area

The South Hams covers an area in South Devon of just under 89,000 hectares. It is predominantly a rural area with four main towns where populations are in excess of 5,000; Dartmouth, Ivybridge, Kingsbridge and Totnes. A main rail line runs through the district as does the A38 Devon Expressway which is the principal road link between Exeter and Plymouth. Road traffic is the major source of pollution in the district. The A38 has an Annual Average Daily Traffic (AADT) flow of more than 40,000 vehicles and an Air Quality Management Area has been declared for one property located immediately adjacent to this road at Dean Prior. New Air Quality Management Areas are in the process of being declared for properties close to main roads in Totnes and Ivybridge.

The South Hams area is popular with tourists and for much of the district there is a significant seasonal increase in traffic

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 1.1. This table shows the objectives in units of micrograms per cubic metre $\mu g/m^3$ (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 Local Air Quality Management in England.

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene			
	16.25 $\mu g/m^3$	Running annual mean	31.12.2003
	5.00 $\mu g/m^3$	Running annual mean	31.12.2010
1,3-Butadiene	2.25 $\mu g/m^3$	Running annual mean	31.12.2003
Carbon monoxide	10.0 mg/m^3	Running 8-hour mean	31.12.2003
Lead	0.5 $\mu g/m^3$	Annual mean	31.12.2004
	0.25 $\mu g/m^3$	Annual mean	31.12.2008
Nitrogen dioxide	200 $\mu g/m^3$ not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 $\mu g/m^3$	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 $\mu g/m^3$, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 $\mu g/m^3$	Annual mean	31.12.2004
Sulphur dioxide	350 $\mu g/m^3$, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 $\mu g/m^3$, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 $\mu g/m^3$, not to be exceeded more than 35 times a year	15-minute mean	31.12.2005

1.4 Summary of Previous Review and Assessments

All previous stages of review and assessment as specified by Defra have been completed as well as an additional report on monitoring results (see table A below). Previously exceedences of the annual average NO_2 objective have been identified at one house at Dean Prior next to the A38 where an Air Quality Management Area is now in place (see plan A). Borderline exceedence levels of this objective have also previously been identified at properties alongside Western Road in Ivybridge and the A385 in Totnes. Both of these areas have been the subject of Detailed Assessments in the past in which it was concluded that declarations of Air Quality Management Areas were not necessary (see Table A). However, because the measured levels of NO_2 did not appear to be declining as originally predicted, the progress report of 2008 suggested that AQMAs should now be declared for these locations and this was accepted by Defra in October 2008. The principle of declaring the two new AQMAs has to go through the Council's committee later this month and the AQMAs should be declared shortly afterwards.

Kingsbridge Fore Street has also been the subject of some concern in the past regarding annual average NO_2 levels and was investigated in a special report in 2007(see Table A). However the levels here only just exceeded the objective for the first time in 2007. As requested by Defra last year, a Detailed Assessment of Kingsbridge Fore Street will be submitted alongside this (2009) USA.

Plan A; Dean Prior Air Quality Management Area

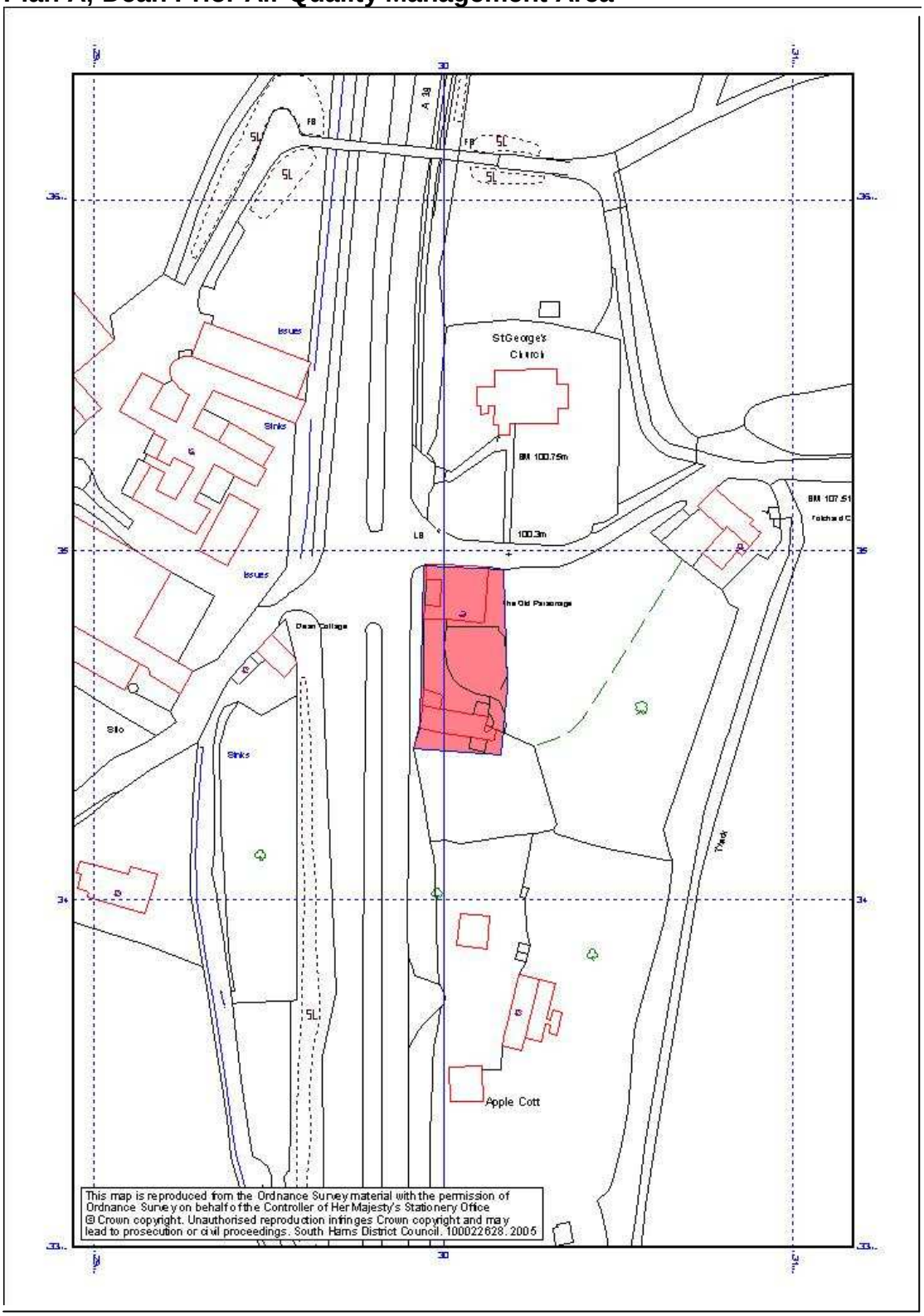


Table A; Key Reports and Declarations for Air Quality Review and Assessment, South Hams District Council

Progress Report	2008
Detailed Assessment of Bridgetown Hill	2007
Additional Monitoring at Kingsbridge Fore Street and Western Road, Ivybridge	2007
Updating and Screening Assessment	2006
Further Assessment Dean Prior AQMA	2006
Declaration Dean Prior AQMA	2005
Progress Report	2005
Detailed Assessment for Western Road, Ivybridge and Dean Prior	2004
Updating and Screening Assessment	2003
Air Quality Strategy	2002
Stages 2 and 3	2000
Stage 1	1998

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

South Hams District Council has one chemiluminescent Nitrogen Dioxide analyser situated adjacent to the A385 on Bridgetown Hill, Totnes (Plans B and C). The analyser is level with a terrace of houses which is at the worst case location at Bridgetown Hill. However levels of NO_2 monitored in the middle of the terrace façade are greater than those at the ends and so the analyser cannot be said to be in the worst case position.

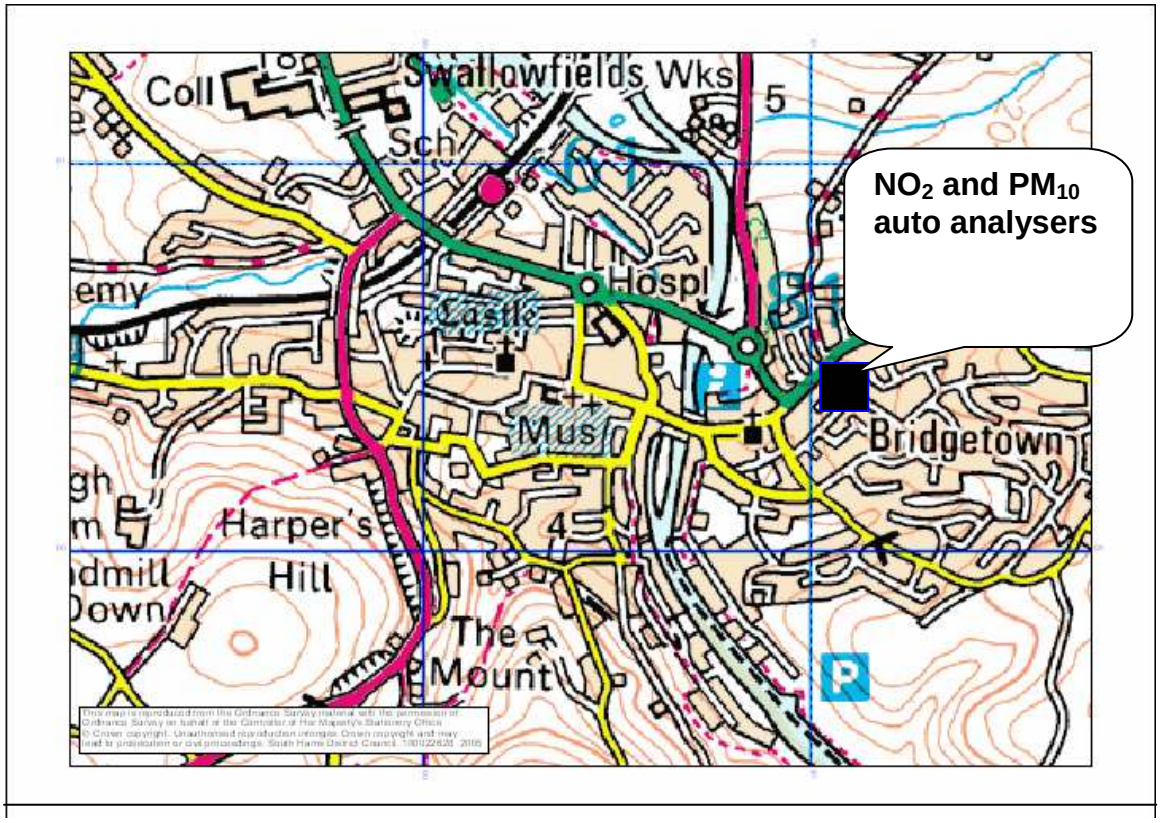
Details of the previous location of the analyser are given in the 2008 Progress Report (SHDC 2008).

The analyser is calibrated at six monthly intervals by the suppliers (Envirotechnology). The data are validated and ratified by the Air Quality Officer at South Hams District Council. This is done by exporting data from the official software into Excel and adjusting it according to the span and zero values obtained from fortnightly calibration checks when the filter is also changed (also undertaken by the Air Quality Officer).

The Council also has an 'Osiris' particulate monitor situated at the same site. This instrument measures PM_{10} and other fractions of particulate matter but it is not approved by defra for Detailed Assessments under the Air Quality Review regime. Its' use is as a screening tool and the data from it have not been validated. However the instrument is calibrated once per year by the suppliers and the filter in it is changed every two or three months by the Air Quality Officer. Results are regularly downloaded to the Air Quality Officer's computer.

Plans B and C; Position of automatic analysers on Bridgetown Hill (A385), Totnes.

Plan B



Plan C (larger scale)

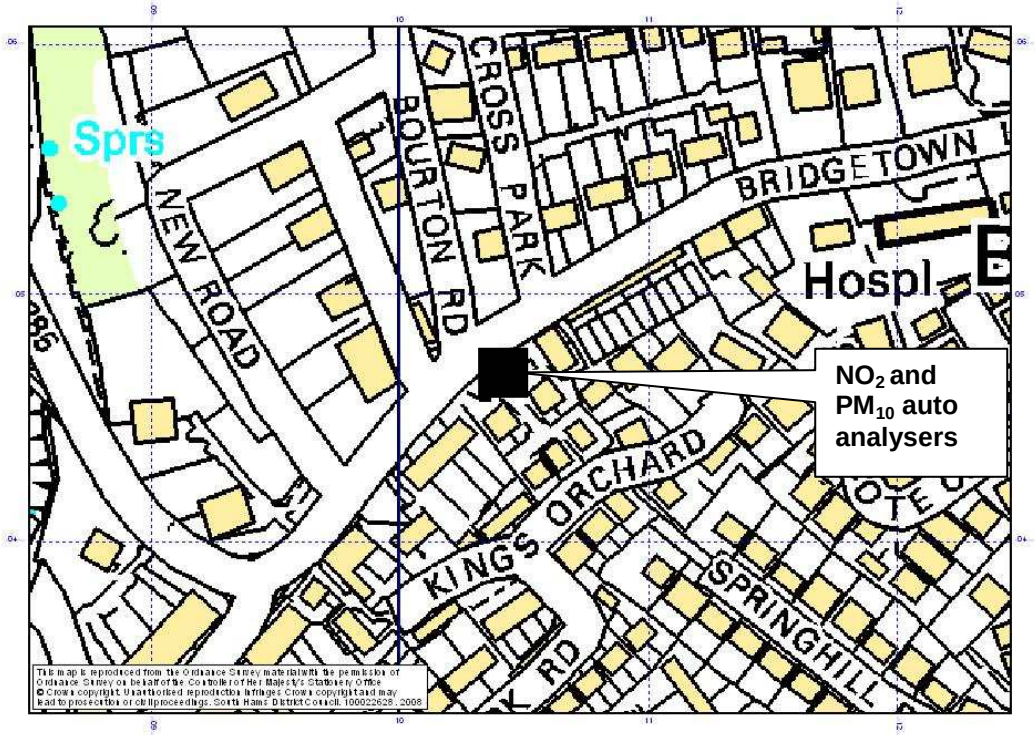


Table 2.1 Details of Automatic Monitoring Sites

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?
Bridge-town Hill	Road side	SX 81040 60478	NO_2	AQMA in process of declaration	N (10m)	2m	N
Bridge-town Hill	Road side	SX 81040 60478	PM_{10}	AQMA in process of declaration	N (10m)	2m	N

2.1.2 Non-Automatic Monitoring

The Council has a network of Nitrogen diffusion tubes throughout the district, mainly around roads where there is known to be a potential problem regarding compliance with the annual average objective for NO_2. Specifically these roads are the A385 in Totnes, the B3213 (Western Road) in Ivybridge, the A38 at Dean Prior (where an AQMA has already been declared –see section 1.4 above) and Kingsbridge Fore Street (un-numbered road). Every effort is made to locate diffusion tubes at relevant locations and to cover every area where there is thought there could be a problem. Details of the quality assurance measures take with the tubes is given in Appendix A.

2.1.3 Table 2.2 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?
Farwell Rd	Urban back-ground	SX 79690 60523	NO_2	N	N (10m)	1m	N
Totnes Fore St.	Kerb-side	SX 80389 60394	NO_2	N	Y	1m	Y
Queens Tce.	Road side	SX 80085 60765	NO_2	N*	Y	5m	Y
Barn Close	suburban	SX 79981 60865	NO_2	N*	Y	8m	N
Devon Ceramics	Kerb-side	SX 80246 60712	NO_2	N*	N(5m)	1m	Y
Bridge-town Hill terrace	Kerbside	SX 81097 60510	NO_2	N*	Y	1m	Y
Bridge-town Hill bottom	Kerbside	SX 80920 60387	NO_2	N*	N (2m)	1m	Y
Bridge-town Hill Lodge	Road-side	SX 80968 60393	NO_2	N*	Y	7m	N
Bridge-town Hill Semi	Road-side	SX 80962 60381	NO_2	N*	Y	10m	N
Bridge-town Hill House	Road-side	SX 81000 60461	NO_2	N*	Y	3m	N
Bridge-town Hill bus	Kerbside	SX 81063 60493	NO_2	N*	Y	1m	Y
End	Kerbside	SX	NO_2	N*	Y	1m	Y

Western Road		63313 56011					
Western Road video	kerbside	SX 63166 55966	NO_2	N*	Y	1m	Y
Western Road villas	Roadside	SX 63093 55946	NO_2	N*	Y	5m	N
Western Road Imperial	Roadside	SX 63192 55989	NO_2	N*	Y	5m	N
Western Road terrace	Kerbside	SX 63220 55981	NO_2	N*	Y	1m	Y
Kingsbridge solicitor	Kerbside	SX 73461 44249	NO_2	N	Y	1m	Y
Kingsbridge Fulfs	Kerbside	SX 73498 44165	NO_2	N	Y	1m	Y
Kingsbridge Moyseys	Kerbside	SX 73460 44202	NO_2	N	Y	1m	Y
Kingsbridge mccoy	Kerbside	SX 73477 44174	NO_2	N	Y	1m	Y
Kingsbridge wray	Kerbside	SX 73448 44307	NO_2	N	Y	1m	Y
Dean Prior Farm	Road side	SX 72956 63476	NO_2	N	N(5m)	3m	N
Dean Prior B	Road side	SX 72995 63484	NO_2	Y	Y	2m	Y
Dean Prior C	Road side	SX 73000 63496	NO_2	Y	Y	3m	N
Dean Prior D	Road side	SX 73005	NO_2	Y	Y	5m	N

		63496					
Dean Prior E	Road side	SX 73010 63496	NO_2	Y	Y	7m	N

N* = AQMA will soon be declared for this area

2.2 Comparison of Monitoring Results with AQ Objectives

The following tables show the results of the monitoring for Nitrogen Dioxide that was undertaken by South Hams District Council in 2008. It can be seen that levels on Bridgetown Hill, Totnes are at, or just over, the annual average objective level as measured by both diffusion tubes and the automatic analyser. There are also some exceedences of this objective at Western Road, Ivybridge. At both of these locations the diffusion tubes entitled 'terrace' are located on the façade of terraces of houses. The levels monitored in the middle of the terrace facades are significantly higher than those measured at the ends of the terraces in both cases, presumably because pollutants get more concentrated in the middle of the terraces. Western Road and Bridgetown Hill were both proposed as AQMAs following last year's progress report (SHDC 2008); defra agreed with this in a letter to the Council in October 2008 and the Council is now in the process of declaring these AQMAs.

There is no problem of exceedence of the hourly objective for NO_2 at Bridgetown Hill which is the only location at which the Council has an automatic analyser able to monitor for this parameter.

There are also a couple of exceedences of the NO_2 annual average objective at diffusion tube locations in Kingsbridge Fore Street. Defra has asked us to look in more detail at Kingsbridge and this is done in an additional assessment which will follow this report.

The other diffusion tube exceedences shown in table 2.4a are all in the Dean Prior Air Quality Management Area which encompasses just one house built adjacent to the A38 (see Plan A). These results are now fed to the Highways Agency for inclusion in their own NO_2 survey.

Table 2.3a Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (μg/m^3)		
				2006 *	2007 *	2008
Bridgetown Hill analyser	Bridgetown Hill Totnes	N*	83	N/A	*41.0*	*39.6*

N* = AQMA will soon be declared for this area
Blue, italicised figures indicate that the period of valid data is less than 90% of a full year.

Table 2.3b Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture 2008 %	Number of Exceedences of hourly mean (200 μg/m^3) *If the period of valid data is less than 90% of a full year, include the 99.8th %ile of hourly means in brackets.*		
				2006 *	2007 *	2008
Bridgetown Hill analyser	Bridgetown Hill Totnes	N*	83			0 (62)

N* = AQMA will soon be declared for this area

Table 2.4 Results of Nitrogen Dioxide tubes: exceedences in bold, Blue, italicised figures indicate that the period of valid data is less than 90% of a full year. ie. at least 2 diffusion tubes out of 12 were missing.

Site ID	Location	Within AQMA?	Proportion of year with valid data 2008 %	Annual mean concentrations (µg/m^3)		
				2006 * BAF= 0.98 Note 1	2007 * BAF= 0.89 Note 1	2008 BAF= 0.92 Note 1
Farwell Rd	Totnes suburb	N	33	*13.7*	*12.3*	*13.8*
Totnes Fore St.	Totnes town	N	67	25.5	21.5	*22.5*
Queens Tce.	Totnes A385	N*	100	N/A	38.3	38.2
Barn Close	Totnes A385	N*	100	25.3	24.0	24.0
Devon Ceramics	Totnes A385	N*	92	34.2	39.2	38.7
Bridge-town Hill terrace	Totnes A385	N*	92	N/A	**42.7**	**42.0**
Bridge-town Hill bottom	Totnes A385	N*	100	*41.9*	**45.4**	**43.6**
Bridge-town Hill Lodge	Totnes A385	N*	100	*25.0*	30.3	28.0
Bridge-town Hill Semi	Totnes A385	N*	92	*20.8*	25.8	24.6
Bridge-town Hill House	Totnes A385	N*	100	N/A	40	38.2
Bridge-town Hill bus	Totnes A385	N*	100	N/A	N/A	36.7
End Western Road	Western Road Ivybridge	N*	84	*39.5*	36.5	*38.1*
Western Road video	Western Road Ivybridge	N*	100	41.7	**44.5**	**43.8**
villas	Western Road Ivybridge	N*	100	33.9	32.9	33.5

Imperial	Western Road Ivybridge	N*	100	29.2	*32.9*	29.6
terrace	Western Road Ivybridge	N*	75	N/A	**47.2**	***53.6***
Kings-bridge solicitor	Kingsbridge Fore Street	N	100	36.5	**41.9**	39.7
Kings-bridge Fulfs	Kingsbridge Fore Street	N	50	N/A	N/A	*18.2*
Kings-bridge Moys	Kingsbridge Fore Street	N	42	N/A	N/A	***47.0***
Kings-bridge mccoy	Kingsbridge Fore Street	N	42	N/A	N/A	*34.7*
Kings-bridge wray	Kingsbridge Fore Street	N	42	N/A	N/A	*34.2*
Dean Prior Farm	A38; Dean Prior AQMA	Y	100	29.8	30.1	29.0
Dean Prior B	A38; Dean Prior AQMA	Y	100	**66.9**	**71.6**	***71.4***
Dean Prior C	A38; Dean Prior AQMA	Y	75	***47.4***	**48.0**	***44.8***
Dean Prior D	A38; Dean Prior AQMA	Y	67	***40.8***	.38.9	***43.0***
Dean Prior E	A38; Dean Prior AQMA	Y	67	*34.3*	33.8	*32.7*

Note 1
BAF=bias adjustment factor; taken from the spreadsheet 03/09 at www.uwe.ac.uk/aqm/review
N* = AQMA will soon be declared for this area

Table 2.5a Results of PM_{10} Automatic Monitoring: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Data Capture 2008 %	Annual mean concentrations (µg/m^3)		
				2006 *	2007 *	2008
	Bridgetown Hill	N*	54	**N/A**	**N/A**	**34.8**

N* = AQMA will soon be declared for this area

Table 2.5b Results of PM_{10} Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture 2008 %	Number of Exceedences of daily mean objective (50 µg/m^3) *If data capture < 90%, include the 90th %ile of daily means in brackets.*		
				2006 *	2007 *	2008
	Bridgetown Hill	N*	54	**N/A**	**N/A**	**5 (35.3)**

N* = AQMA will soon be declared for this area

2.3 Sulphur Dioxide

There are no sulphur dioxide monitoring results to report

2.4 Benzene

There are no benzene monitoring results to report

2.5 Other pollutants monitored

There are no other pollutant monitoring results to report

South Hams District Council has examined the results from monitoring in the district. Concentrations are all below the objectives except in areas where there is already an AQMA or where one is about to be declared, 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

South Hams District 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

South Hams District 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.

South Hams District Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

South Hams District 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

South Hams District Council confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

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

3.7 Bus and Coach Stations

South Hams District Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

South Hams District Council confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

South Hams District 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

South Hams District 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)

South Hams District 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

There is a new combined cycle gas power station currently being constructed at the western edge of South Hams district at Langage, Plympton. This development was originally applied for in 1999 and extensive modelling of air quality impacts was undertaken then. This was reported on in the Review and Assessment produced in 2000 (SHDC 2000). There has been no significant adverse change regarding likely air quality impacts since that modelling was undertaken; the time lag is so long because of economic/political factors which delayed the power station development.

South Hams District Council has assessed a new/proposed industrial installation in a previous round of review and assessment (see SHDC 2000), and concluded that it will not be necessary to proceed to a Detailed Assessment.

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

South Hams District 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

South Hams District 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

South Hams District Council confirms that there are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

South Hams District Council confirms that there are no petrol stations meeting the specified criteria**.**

5.4 Poultry Farms

South Hams District Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

South Hams District Council confirms that there are no relevant biomass combustion plants in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

South Hams District Council confirms that there are no relevant biomass combustion plants in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

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

7 Fugitive or Uncontrolled Sources

South Hams District 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

Monitoring data alongside Western Road, Ivybridge and the A385 in Totnes continue to indicate that annual average NO_2 levels are at, or just over, the objective for at least some receptors. The Council is already in the process of declaring Air Quality Management Areas for these locations.

Monitoring data at the existing AQMA at Dean Prior show that the designation is still necessary as levels of Nitrogen Dioxide are still significantly above the annual average objective level. Indeed levels here are high enough to suppose that the hourly objective for NO_2 may be breached as well, though there is no monitoring equipment available to back this up.

Some diffusion tubes in Kingsbridge Fore Street indicated annual average NO_2 levels hovering around the objective level. This will be looked at in more detail in a more detailed report on this location which will follow the submission of this report.

8.2 Conclusions from Assessment of Sources

There are no problems associated with the assessment of sources.

8.3 Proposed Actions

Two new Air Quality Management Areas will be declared subject to Member approval; one for Western Road, Ivybridge and one for the A385 in Totnes. The existing AQMA at Dean Prior will remain the same.

A report on Kingsbridge Fore Street will be forwarded to Defra as soon as possible.

9 References

LAQM.TG(09) Local Air Quality Management Technical Guidance, Defra, February 2009.

SHDC 2000 Air Quality Review and Assessment 2nd and 3rd Stages, South Hams District Council, Totnes, see www.southhams.gov.uk for a summary or contact Sarah Harcombe on 01803 861164.

SHDC 2008 Progress Report, see www.southhams.gov.uk

Appendices

Appendix A: QA:QC Data

QA/QC of diffusion tube monitoring

The tubes used by South Hams District Council are supplied, prepared and analysed by Gradko International Ltd. The preparation method used is 20% Triethanolamine (TEA) in Water.

Gradko lays down procedures for tube handling which are followed by Council officers.

Gradko has a quality assessment system in place for both the stock Triethanolamine solution and the made-up NO_2 diffusion tubes. In the first case, a stock solution containing a known amount of nitrite is received from AEA Technology Environment once a month. This is measured, and the results are used as part of the UK NO_2 Survey AQ/AC Scheme. This stock solution is used by Gradko International to check the u.v .spectrophotometer calibration graph (which is used in the tube analysis). In the second case, samples of tubes prepared for exposure are periodically spiked with known concentrations of nitrite solution and measured. Blank tube values are also monitored from each new batch of tubes prepared.

The accuracy of the lab measurements is also monitored by participation in an external Laboratory Measuremnt Proficiency Scheme ie. WASP (implemented by the Heatlh and Safety Laboratory at Sheffield). In addition, Gradko NO_2 analysis is regularly included within the UK NO_2 Field Survey Intercomparison Report co-ordinated by AEA Technology; this survey involves comparison with chemiluminescent measurements.

According to the summary of precision results on the Help Desk run by the University of the West of England (www.uwe.ac.uk/aqm/review), the 2008 results for this type of Gradko type and analysis showed good precision in

9/11 cases. (There are no details of WASP performance available on any of the air quality help web sites that I am able to see.)

Diffusion Tube Bias Adjustment Factors

This report has used the national database bias adjustment factor of 0.92 given on spreadsheet 03/09 at www.uwe.ac.uk/aqm/review for this type of diffusion tube.

Factor from Local Co-location Studies (if available)

South Hams District Council has undertaken its own co-location study and the results are show in the following table.

CO-LOCATION RESULTS; ALL RESULTS SCALED AND SCREENED, IN µg/m^3

	Jan 08 2/01/08 – 13.30- 6/02/08 15.30	Feb 08 6/2/8- 15.30- 28/2/8- 11.15
Average analyser result	37.3	57.7
% data capture	85	86
Average co-located diffusion tube result	34.9	56.4
Bias adjustment factors = Cm/Dm, ie. analyser mean/diffusion tube mean	1.07	1.02

	March 08 28/2 11.15- 4/4 13.30	April 08 4/4 13.30 to 7/5 11.30	May 08 7/5 11.30 to 18/6 15.00	June 08 18/6 15.00 to 11/7 15.00	July 08 11/7 15.00 to 7/8 15.00
Average analyser result	34.5	43.9	47.7	30.9	31.2
% data capture	86	86	69	87	40.8
Average co-located diffusion tube result	36.4	42.5	41.8	35.6	39.4
Bias adjustment factors = Cm/Dm, ie. analyser mean/diffusion tube mean	0.95	1.03	1.14	0.87	0.79

	August 08 7/815.00 to 4/9 15.45	September 08 4/9 16.45 to 3/10 13.30	October 08 3/10 13.30 to 3/11 13.30	November 08 3/11 13.30 to 3/12 13.00	December 08
Average analyser result	30.9	37.8	37.0	40.9	48.9
% data capture	83	97	97	98	95
Average co-located diffusion tube result	31.7	35.1	36.7	45.25 44.07 48.25 av = 45.9	42.06 50.79 50.44 av=47.8
Bias adjustment factors = Cm/Dm, ie. analyser mean/diffusion tube mean	0.97	1.08	1.0	0.89	1.02

Bias adjustment factors = Cm/Dm, ie. analyser mean/diffusion tube mean
Jan 08 = 37.3/34.9 = 1.07
Feb 08 = 57.7/56.4 = 1.02
March 08 = 34.5/36.4 = 0.95
April 08 = 43.9/42.5 = 1.03
May 08 = 47.7/41.8 = 1.14
June 08 = 30.9/35.6 = 0.87
July 08 = 31.2/39.4 = 0.79
Aug 08 = 30.9/31.7 = 0.97
Sept 08 = 37.8/35.1 = 1.08
Oct 08 = 37/36.7 = 1.0
Nov 08 = 40.9/45.9 = 0.89
Dec 08 = 48.9/47.8 = 1.02
Annual average Bias Adjustment Factor from own study = 0.986

Discussion of Choice of Factor to Use

The bias adjustment factor from the national data base was chosen with reference to the guidance given in Box 3.3 of LAQM.TG(09). In particular, two points were relevant in choosing the combined bias adjustment factor over the local one, these were;
*Where the automatic analyser has been operated using local, rather than national, QA/QC procedures.
* Where data capture from the automatic analyser is less than 90%...

Both of these points apply to our own bias adjustment factor, so the combined one from the national data base was selected for use in the report.

The national bias adjustment factor is slightly lower than our local one thus reducing the diffusion tube results further than would be the case if our local factor was used. Most of the results which are close to the objective level are in areas that are already, or are about to be declared, Air Quality Management Areas.

PM Monitoring Adjustment

NO PM monitoring adjustment was available and the results given in section 2.2.2 are for screening purposes only.

Short-term to Long-term Data adjustment

There has been no need to make any of these adjustments in this report.

QA/QC of automatic monitoring

The Air Quality Officer from South Hams District Council undertakes the calibration checks on the automatic Nitrogen Dioxide analyser once every fortnight. The span and zero values are then used to adjust the data using an Excel spreadsheet.

Calibration is carried out once every six months by 'Envirotechnology' who are also the suppliers of the equipment.