

Air Quality Monitoring Overview for 2010

In 2010, five different air quality pollutants were monitored in the Borough:

- nitrogen dioxide;
- particulate matter (PM10 & PM2.5);
- sulphur dioxide;
- carbon monoxide; and
- ozone.

These were monitored by diffusion tubes located across the Borough and at three continuous monitoring stations (at Sunbury Cross; Oaks Road Stanwell; and adjacent to M25 north of junction 13). The pollutants were monitored as follows at each location:

Diffusion Tubes	M25	Oaks Road	Sunbury Cross
Nitrous oxides (nitrogen dioxide)	Nitrous oxides (nitrogen dioxide)	Nitrous oxides (nitrogen dioxide)	Nitrous oxides (nitrogen dioxide)
	Ozone	Ozone	
BTEX (Benzene, Toluene, Ethylene, Xylene)	Particulate Matter (PM10 & PM2.5)	Particulate Matter (PM10 & PM2.5)	Particulate Matter (PM10)
	Sulphur dioxide		
	Carbon monoxide		

Results of the monitoring are compared against the following National Air Quality Objectives:

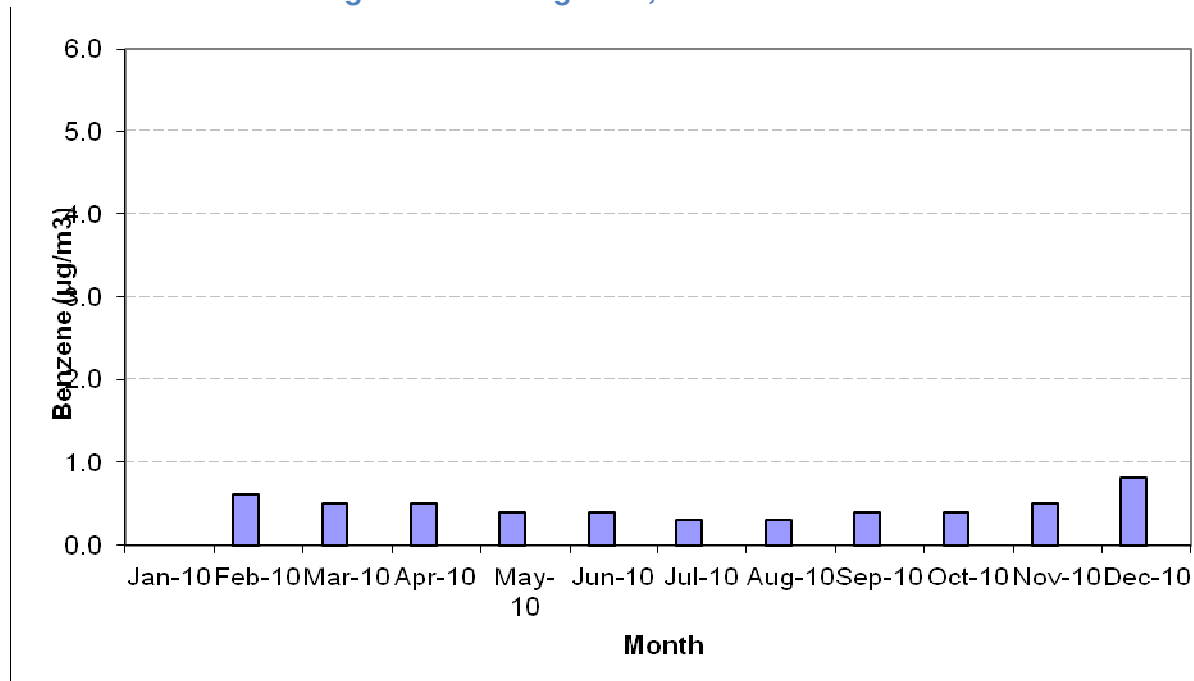
Pollutant	Air Quality Objective	
	Concentration	Measured as
Nitrogen dioxide	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean
	40 µg/m ³	Annual mean
Particles (PM10)	50 µg/m ³ not to be exceeded more than 35 times a year	1 hour mean
	40 µg/m ³	Annual mean

Benzene	5 µg/m ³	Annual mean
Carbon monoxide	10.0 mg/m ³	Running 8-hour mean
Sulphur dioxide	350 µg/m ³ not to be exceeded more than 24 times a year	1 hour mean
	125 µg/m ³ not to be exceeded more than 3 times a year	24 hour mean
	266 µg/m ³ not to be exceeded more than 35 times a year	15 minute mean
Ozone	100 µg/m ³ not to be exceeded more than 10 times a year	8 hour mean

Levels of sulphur dioxide carbon monoxide, and ozone measured at the M25 site have routinely been below each of the relevant national air quality objectives. The maximum daily running 8 hour mean of carbon monoxide at the M25 station in 2010 was 1.8 mg/m³. There were 6 of exceedances of 100 µg/m³ as the 8 hour running mean of ozone. There were no exceedances of the sulphur dioxide mean values. Discussion follows on the monitoring results for benzene, nitrogen dioxide and particulate matter.

Benzene

2010 Benzene Monitoring results – Long Lane, Stanwell



Monitoring of benzene via diffusion tubes at a location near a petrol station was discontinued in 2007, as levels were found to be well below the relevant objectives. A BTEX diffusion tube was added at Long Lane, Stanwell in December 2009 in response to the London Borough of Hounslow's 2009 Updating & Screening Assessment report that recommended further assessment of a fuel oil depot on the boundary of the two Councils. The annual mean concentration for benzene was 0.5 µg/m³, which is well below the NAQS objective of 5 µg/m³.

Nitrogen Dioxide

This is the principal pollutant of concern in the Borough and is monitored at all locations. Figure 1 shows the location of the monitoring sites and the recorded levels of annual mean nitrogen dioxide for 2010 relative to the objective of 40 µg/m³. Concentrations below this are shown with a green circle, with exceedances as a red square.

Highways Agency Diffusion Tube Survey

In 2008, the Council joined a Highways Agency (HA) study of levels of nitrogen dioxide at houses close to major roads. This added three new diffusion tube monitoring locations to the network (HA1 to HA3), as follows:

- HA1 – Moor Lane, Staines (within 25m of M25 motorway)
- HA2 – Harrison Way, Shepperton (45m from M3 motorway)
- HA3 – London Road Staines (on A30 by Crooked Billet roundabout)

Uncertainty over funding for the HA project meant no tubes were available in April and May 2010. The Highways Agency survey changed the way it collates data in 2010 from financial year to calendar year. Results for the last three years using this methodology are presented below:

	2008		2009		2010	
	µg/m ³	% data capture	µg/m ³	% data capture	µg/m ³	% data capture
HA1 – Moor Lane	40.0	87.5	38.0	91.7	38.6	58.3
HA2 – Harrison Way	35.0	100	28.1	91.7	30.1	91.7
HA3 – London Road	43.2	100	39.9	91.7	40.1	83.3

These results suggest lower concentrations since 2008 for these three locations, with 2010 results being stable to slightly elevated in comparison with 2009.

Spelthorne Council's Diffusion Tube Network

Results from each of the diffusion tube locations in the Council's own network are presented in the table overleaf, corrected for method bias against the Oaks Road continuous monitoring station, for the last three years. In 2010, the objective was

exceeded at 9 diffusion tube monitoring locations, all of which were in exceedance in 2009 and/ or 2008. The diffusion tubes showed concentrations greater than the 40 µg/m³ annual average objective at 12 locations around the Borough in 2007 and 2008, though not at all the same locations. In 2009 the objective was exceeded at 9 locations. The margin of exceedance was higher at some locations than in 2009 but smaller at others. In general concentrations monitored in 2010 were higher than those of 2009.

Heathrow Area Diffusion Tube Survey

In 2010, the Council received funding from the Department for Environment, Food and Rural Affairs (Defra) for a one year diffusion tube monitoring study at 20 locations around the Heathrow area within Spelthorne.

SBC Ref	Address	% data capture	Annual Mean	Bias Adjusted Mean *
HSP01	Oaks Road, Stanwell	100.0	34.2	35.2
HSP02	14 Brook Close, Stanwell	100.0	29.8	30.7
HSP03	Long Lane, Stanwell	100.0	43.5	44.8
HSP04	Northumberland Avenue, Stanwell	100.0	43.8	45.1
HSP05	Whitley Close, Stanwell	100.0	35.2	36.2
HSP06	73 Falcon Drive, Stanwell	66.7	35.6	36.7
HSP07	Clare Road, Stanwell	100.0	33.6	34.6
HSP08	Town Lane, Stanwell	83.3	29.6	30.5
HSP09	Hadfield Close, Stanwell	91.7	31.0	32.0
HSP10	Selwood Close, Stanwell	100.0	32.7	33.7
HSP11	Horton Road, Stanwell	100.0	42.2	43.5
HSP12	Riverside Road, Stanwell	91.7	40.3	41.5
HSP13	London Road, Ashford Hospital	100.0	51.1	52.6
HSP14	London Road, Ashford	100.0	34.5	35.5
HSP15	132 Horton Road, Stanwell Moor	100.0	30.8	31.7
HSP16	The Mill Horton Road, Stanwell Moor	91.7	33.0	34.0
HSP17	40 Spout Lane, Stanwell Moor	100.0	31.5	32.4
HSP18	153 Hithermoor Road, Stanwell Moor	100.0	25.8	26.6
HSP19	Leylands Lane, Stanwell Moor	66.7	28.8	29.6
HSP20	41 Mountsfield Road, Stanwell Moor	83.3	28.8	29.7

* Bias adjustment factor of 1.03 from National Bias Adjustment Factors for Gradko 50% in Acetone tubes, 2010, version 9/2011.

Spelthorne Diffusion Tube Monitoring Results

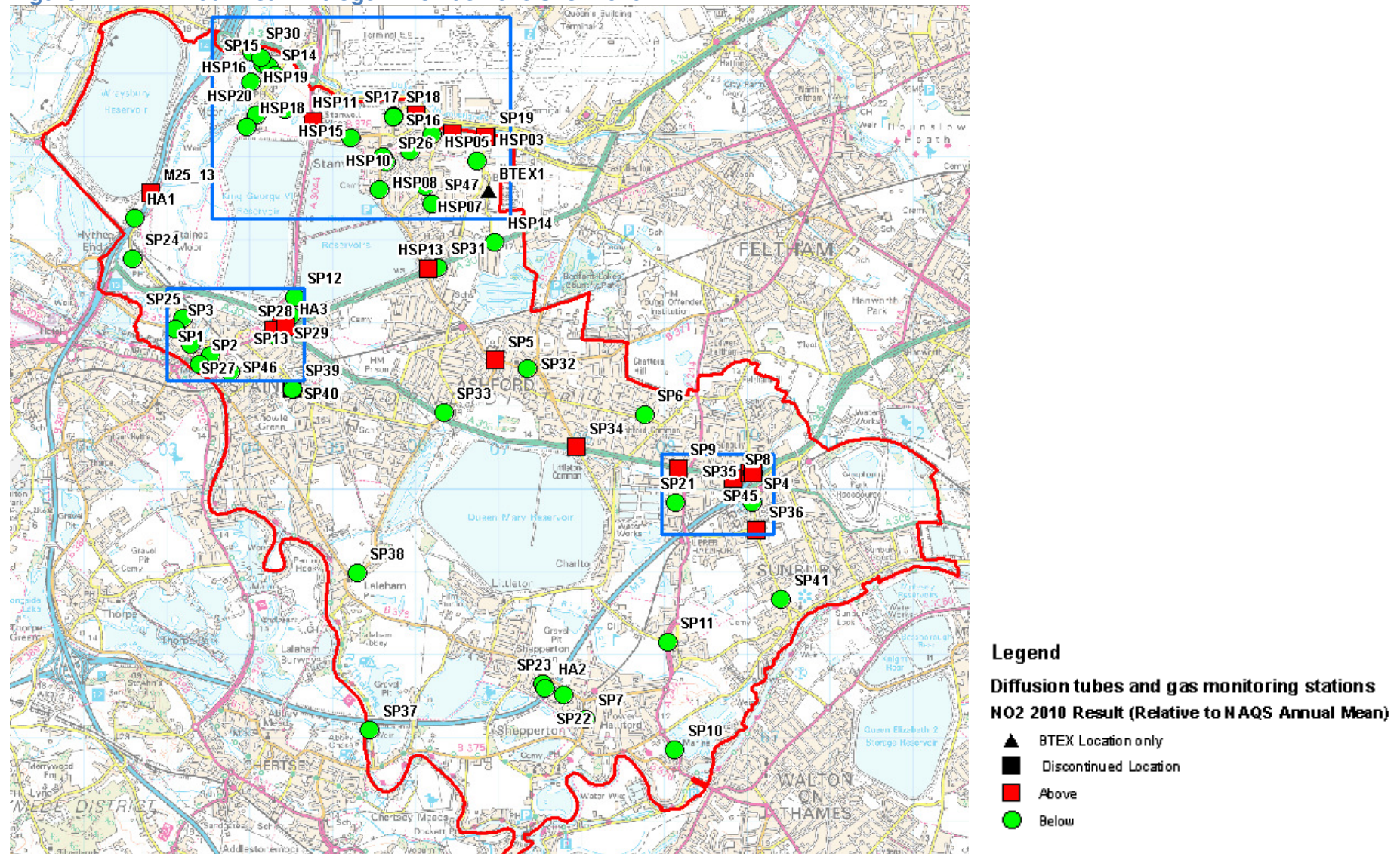
Site ID	Location	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)		
		2008 ^a	2009 ^b	2010 ^c
SP1	Staines High Street	33.3	31.2	32.7
SP2	Market Square, Staines	33.7	30.6	34.3
SP3	Wraysbury Road	37.9	35.2	37.2
SP4	Benwell Centre, Sunbury	33.3	30.8	32.7
SP5	Church Street, Ashford	45.3	43.7	43.8
SP6	Goffs Road, Ashford Common	31.8	27.9	32.5
SP7	High Street, Shepperton	37.2	35.6	39.9
SP8	The Parade, Sunbury Cross	54.6	53.2	50.1
SP9	Staines Road West, Sunbury	47.5	45.2	47.0
SP10	Walton Bridge Road	35.8	33.9	35.8
SP11	Halliford Bypass	42.8	37.8	37.4
SP12	Stanwell New Road, Stanwell North	38.3	30.3	33.7
SP13	Shortwood County Infant School, Stanwell North	37.9	33.0	31.7
SP14	Flintlock Close, Stanwell	35.6	30.8	33.2
SP15	Horton Road, Stanwell Moor	33.6	30.2	31.6
SP16,	Oaks Road/Russell Drive, Stanwell South	36.3	31.7	33.2
SP17,		35.5	31.9	37.3
SP18		36.4	32.2	36.5
SP19	Bedfont Road/Long lane, Stanwell South	48.6	41.5	44.3
SP20	Greenlands Road, Staines	34.6	30.3	34.2
SP21	Lincoln Way, Ashford	30.0	28.4	30.3
SP22	Manor Mead School Shepperton	28.3	27.6	30.4
SP23	Greeno Crescent, Shepperton	32.4	28.3	28.9
SP24	Yeoveney Close, Staines	37.3	33.4	34.7
SP25	Moor Lane, Staines	30.9	27.8	27.8
SP26	St Mary's Crescent, Staines	36.6	33.8	34.3
SP27	Church Street, Staines	39.8	38.6	38.2
SP28	London Road, Staines	52.9	49.9	47.4
SP29	London Road, Staines	57.7	53.3	51.0
SP30	Horton Road, Stanwell Moor	33.9	33.6	31.2
SP31	Ashford Hospital, Stanwell	39.5	36.7	37.5
SP32	Feltham Road, Ashford	39.3	38.7	36.6
SP33	Ford Close, Ashford	40.4	36.8	37.4
SP34	School Road, Ashford	46.1	43.7	44.8
SP35	Vicarage Road, Sunbury	46.2	44.3	42.1
SP36	St Ignatius School, Sunbury	44.8	39.6	41.7
SP37	Nr Abbeyfields, Thames Side, Laleham	32.2	30.0	30.3
SP38	Laleham CofE primary, Laleham	29.7	28.2	25.9
SP39	Knowle Green, Staines	31.5	28.0	28.3
SP40	Knowle Green, Staines	27.0		
SP41	Green Street, Sunbury	37.1	36.3	37.3
SP43,	The Haven, Sunbury	36.1	42.1	36.2
SP44,		37.3	37.3	37.6
SP45		39.5	36.8	32.8
SP46	Elmsleigh Centre	52.8	32.1	36.1
SP47	Hadrian Way, Stanwell	33.1	28.6	30.0

^a Bias adjusted using a factor of 1.00

^b Bias adjusted using a factor of 1.05

^c Bias adjusted using a factor of 0.99

Figure 1 Annual Mean Nitrogen Dioxide Levels for 2010



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Figure 2 2010 Annual Mean Nitrogen Dioxide Levels in Staines area

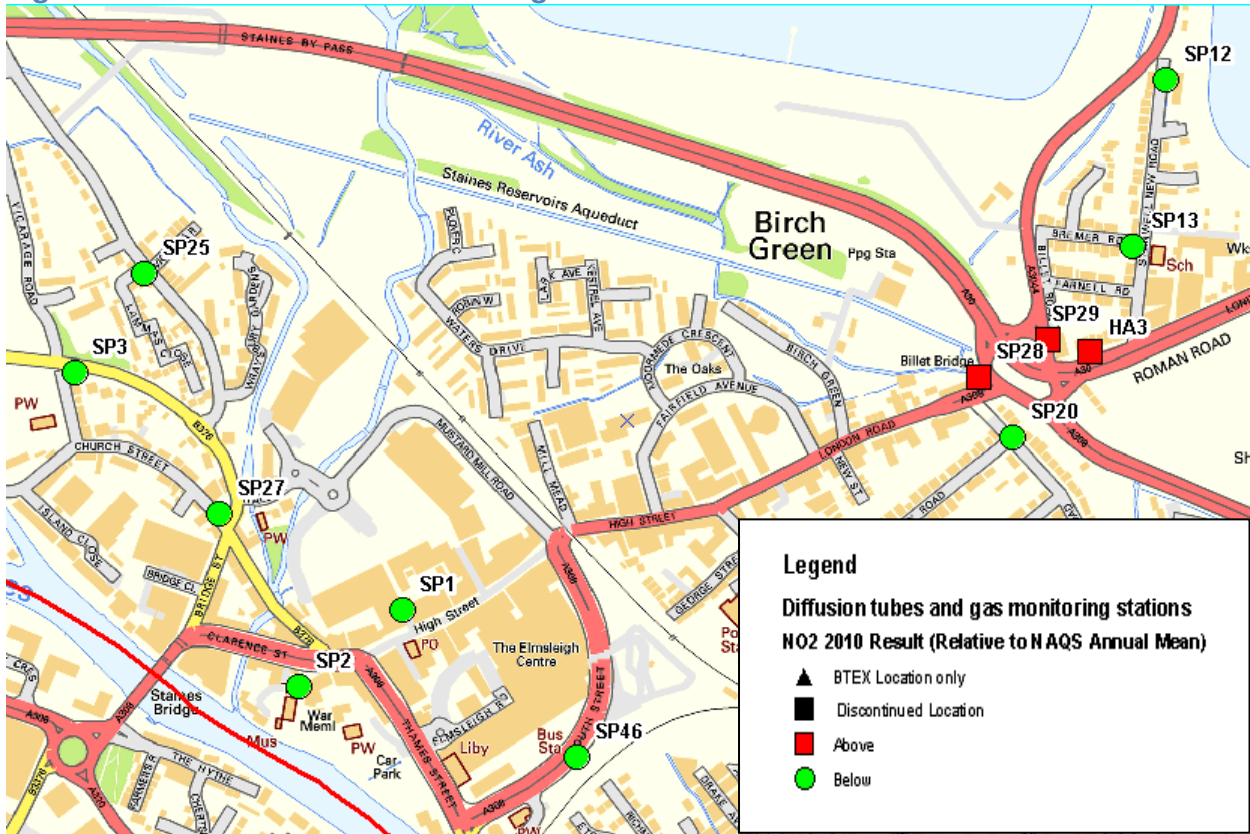
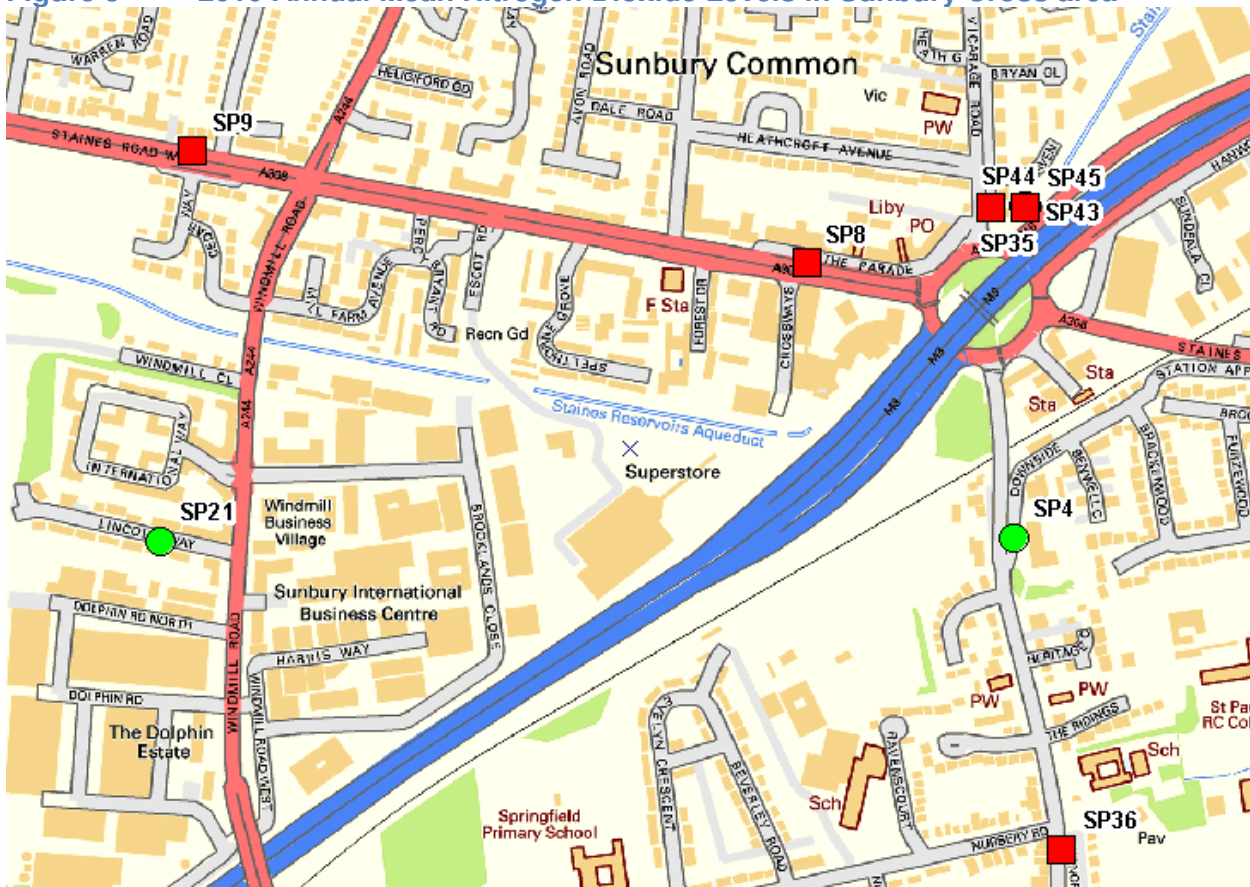
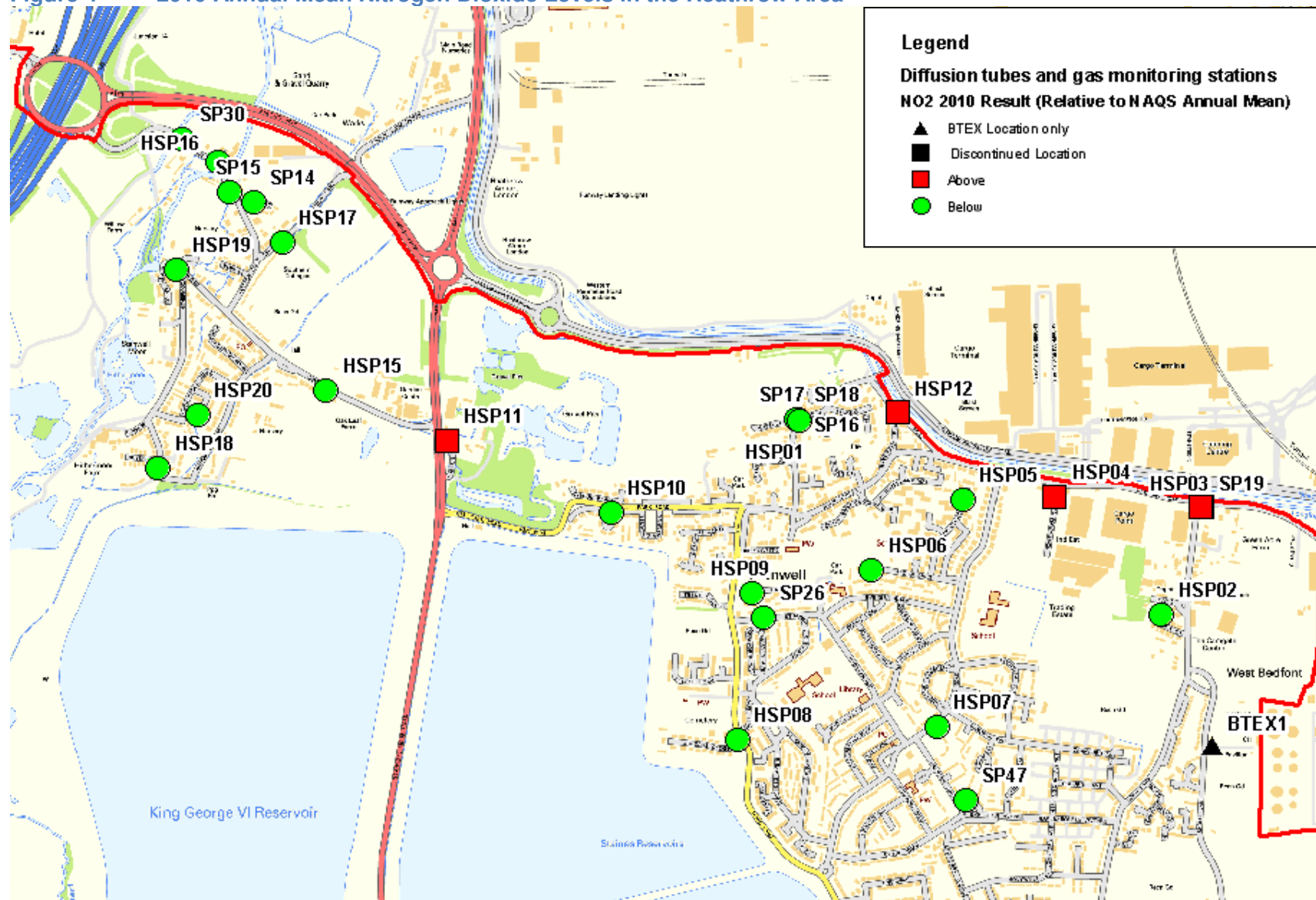


Figure 3 2010 Annual Mean Nitrogen Dioxide Levels in Sunbury Cross area



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Figure 4 2010 Annual Mean Nitrogen Dioxide Levels in the Heathrow Area



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The results of the 2010 Heathrow area diffusion tube survey (see Figure 4) show that the national air quality objective was exceeded at 5 locations. Tubes HSP03, HSP04 and HSP12 were all located along the boundary with the airport just south of the cargo terminal. Tube HSP03 was located with SP19, which also exceeded the national air quality objective for annual mean nitrogen dioxide in 2010. Tube HSP13 was located on the junction of the A30 London Road with Town Lane at Ashford Hospital. The Council's diffusion tube SP31 is also located on the A30, approximately 110m from this junction.

Continuous Monitoring Stations

Concentrations of nitrogen dioxide at the monitoring stations in Oaks Road Stanwell were below the national air quality objective of 40 $\mu\text{g}/\text{m}^3$ for annual average, and comply with the objective for hourly mean levels too. The annual mean at the M25 J13 site was once again above the objective, but did not breach the limit for hourly mean exceedances. There is no relevant exposure at this monitoring site (which is the hard-shoulder of the motorway). Diffusion tube HA1 is located at a residential property and there levels were measured by diffusion tube to be below the limit.

In 2009 the annual average nitrogen dioxide concentration measured at the Sunbury Cross monitoring station, at 43.2 $\mu\text{g}/\text{m}^3$, exceeded the national air quality objective of 40 $\mu\text{g}/\text{m}^3$ for the first time since monitoring started at the site in late 2006. In 2010 margin of exceedance was larger as the annual mean concentration measured was 48.4 $\mu\text{g}/\text{m}^3$. There were no exceedances of the hourly mean at the monitoring station site, though it may be exceeded at relevant locations nearer Sunbury Cross.

Results for the continuous monitoring stations are as follows:

Location	Number of Exceedences of Hourly Mean (200 $\mu\text{g}/\text{m}^3$)			Annual Mean Concentrations ($\mu\text{g}/\text{m}^3$)		
	2008	2009	2010	2008	2009	2010
Sunbury Cross	0	0	0	35.1	43.2	48.3
Heathrow Oaks Road	0	1	0	35.4	34.4	37.0
M25 J13	12	7	17	52.4	57.0	61.6
Objective	18	18	18	40	40	40

Particulate Matter

This pollutant was monitored at each of the continuous monitoring stations in the Borough. The monitoring at Sunbury Cross was funded by a grant from Defra through to December 2009 using a TEOM analyser following a study by the Council using an OSIRIS portable monitor in 2007/08. The Council was able to continue monitoring through to January 2011 when the TEOM was decommissioned. Results of the PM₁₀ monitoring are presented in the table below.

Location	Number of Exceedences of Daily Mean (50 µg/m ³)			Annual Mean Concentrations (µg/m ³)		
	2008	2009	2010	2008	2009	2010
Sunbury Cross	1	3	3	22.7 ^{1,2}	21.1 ²	20.1 ²
Oaks Road	8	1	2	22.0	21.2	20.7
M25 J13	18	7	11	26.3	23.9	24.9
Objective	35	35	35	40	40	40

¹ Data from 22/11/07 to 26/2/08 using an OSIRIS, as reported in the Progress Report 2008

² Data from 20/11/08 to 31/12/10 with TEOM. Gravimetric equivalent - VCM Corrected

Results of monitoring over the past three years indicate that there is a general trend of reducing concentrations of particulate matter (as PM₁₀) as an annual average and in the days where the mean concentration is elevated above 50 µg/m³, particularly at background sites.

There is no statutory obligation on councils to monitor fine particles (less than 2.5 µm diameter), though it is monitored at the Oaks Road site. It was previously monitored at the M25 J13 site. The annual average concentration of PM_{2.5} measured at the M25 site in 2009 was 13.9 µg/m³. Results for Oaks Road gave an annual average concentration of 10.3 µg/m³ for 2009 and 10.6 µg/m³ for 2010. These results are well below the Government's proposed objective of 25 µg/m³.