

Updating and Screening Assessment 2006

Surrey Heath Borough Council
May 2006

Executive Summary

An Updating and Screening Assessment has been performed for the seven UK criteria pollutants in the Borough of Surrey Heath. The aim of this assessment is to determine whether there is the potential for exceedences of any of the UK national air quality objectives. If this potential is identified a Detailed Assessment is recommended.

None of the UK air quality objectives are likely to be breached within Surrey Heath Borough for benzene, 1.3-butadiene, carbon monoxide, PM₁₀, sulphur dioxide or lead. A Detailed Assessment will not be required for any of these pollutants.

This assessment confirms that the concentration of NO₂ is likely to exceed the UK objective within the existing AQMA along a section of the M3 corridor. It is recommended that the AQMA remains in place and that a Detailed Assessment is not required for this pollutant.

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1 Introduction

This report constitutes the second Updating and Screening Assessment (USA) of the air quality review and assessment requirements of the Surrey Heath Borough Council. A previous USA was completed in 2003.

The Borough of Surrey Heath is located in the south east of England, to the south west of London. Camberley and Frimley are the main urban areas. The main routes through the area are the M3 motorway, A30, A325, A322 and the A331.

1.1 Overview of Air Quality Legislation and Policy

1.1.1 *Overview of Recent Air Quality Legislation and Policy*

The provisions of Part IV of the Environment Act 1995 establish a national framework for air quality management, which requires all local authorities in England, Scotland and Wales to conduct local air quality reviews. Section 82(1) of the Act requires these reviews to include an assessment of the current air quality in the area and the predicted air quality in future years. Should the reviews indicate that the standards prescribed in the National Air Quality Strategy (NAQS) and the Addendum to the Strategy will not be met, the local authority is required to designate an Air Quality Management Area (AQMA). Action must then be taken at a local level to ensure that air quality in the area improves. This process is known as Local Air Quality Management.

1.1.2 *The Phased Approach to Review and Assessment*

The second round of the Review and Assessment process has been split into two phases: an Updating and Screening Assessment and a Detailed Assessment.

The first phase, the Updating and Screening Assessment, has been designed to review the changes in air quality issues that have occurred within each local authority since the first round of Review and Assessment. These changes are assessed using appropriate screening methods. Therefore, it should cover:

- new monitoring data
- new objectives
- new sources of pollution
- significant changes to existing sources of pollution.

The Updating and Screening Assessment also re-examines locations and sources, e.g. road junctions, bus stations, domestic burning, fugitive sources, etc., that have been highlighted as issues during the previous round of review and assessment.

Where the Updating and Screening Assessment has identified a risk that an air quality objective may be exceeded, the local authority must undertake a Detailed Assessment. The aim of this assessment is to determine with as much certainty as is possible whether or not an air quality objective will be exceeded. If an exceedence is predicted, the local authority should designate an AQMA to cover the area of the exceedence.

1.1.3 *National Air Quality Strategy (NAQS)*

The NAQS identifies eight ambient air pollutants that have the potential to cause harm to human health. These pollutants are associated with local air quality problems, with the exception of ozone, which is instead considered to be a regional problem.

The Air Quality Regulations set standards for the seven pollutants that are associated with local air quality. These objectives aim to reduce the health impacts of the pollutants to negligible levels. The standards stated in the Air Quality Regulations are listed in Table 1.

The revised objectives for benzene, carbon monoxide and suspended particulate matter (PM₁₀), as detailed in the 'Air Quality (England)(Amendment) Regulations 2002', are included.

Table 1: UK Objectives included in the Air Quality Regulations 2000 and (Amendment) Regulations 2002

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$ All authorities	running annual mean	31.12.2003
	5.0 $\mu\text{g}/\text{m}^3$ Authorities in England and Wales only	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 Authorities in England, Wales and N. Ireland.	maximum daily running 8-hour mean	31.12.2003
Lead	0.5 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2004
	0.25 $\mu\text{g}/\text{m}^3$		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) All authorities	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
Particles (PM ₁₀) (gravimetric) Provisional objectives for England (not London) and Wales	50 $\mu\text{g}/\text{m}^3$ not to be exceeded more than 7 times a year	24 hour mean	31.12.2010
	20 $\mu\text{g}/\text{m}^3$	annual mean	31.12.2010
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

1.2

Changes Since Previous Updating and Screening Assessment

There have been no relevant changes within the Borough since the previous Updating and Screening Assessment.

1.3

Previous Assessments

The 2004 Stage 4 Review and Assessment was produced to assess the concentration of NO₂ and PM₁₀ AQMA between Frimley Road to Ravenswood Roundabout, Camberley. The conclusions of this assessment were that the annual mean objective for NO₂ was likely to be exceeded at the façades of the buildings alongside the M3 corridor within the current AQMA.

The AQMA is currently declared for NO₂ for the area including the houses bordering and the M3 between Frimley Road and the Ravenswood Roundabout, Camberley.

2 Pollutant Checklists

Pollutant checklists for each of the seven pollutants are provided in this section. The checklist items have been taken from the appropriate 'box' in LAQM.TG(03) (January 2006 update).

2.1

Carbon Monoxide

Checklist Item (from Box 2.2)	Updating and Screening Assessment
Monitoring Data A) Monitoring data	Carbon monoxide is not monitored within Surrey Heath.
Road Traffic- B) Very busy roads or junctions in built-up areas	There are no relevant very busy roads or junctions in Surrey Heath Borough (i.e. single carriageway roads where the AADT>80,000, or dual carriageway roads where the AADT>120,000). The M3 motorway does have an AADT that may exceed 140,000, although there are no sensitive receptors within 10 m of the curb.
Conclusion	The assessment has indicated that the CO objective is unlikely to be exceeded at any location in the Borough, and therefore a Detailed Assessment for this pollutant will not be required.

2.2

Benzene

Checklist Item (from Box 3.2)	Updating and Screening Assessment
Monitoring Data A) Monitoring data outside an AQMA	Benzene is not monitored within Surrey Heath; there is no AQMA within the Borough.
B) Monitoring data within an AQMA	
Road Traffic- C) Very busy roads or junctions in built-up areas	There are no relevant very busy roads or junctions in Surrey Heath Borough (i.e. single carriageway roads where the AADT>80,000, or dual carriageway roads where the AADT>120,000). The M3 motorway does have an AADT that may exceed 140,000, although there are no sensitive receptors within 10 m of the curb.
Industrial Sources D) New industrial sources	There are no petroleum processes or other industrial processes that emit sufficient quantities of benzene within Surrey Heath Borough, or in neighbouring authorities, to consider for the purpose of this assessment.
E) Industrial sources with substantially increased emissions, or new relevant exposure.	
Other Sources F) Petrol stations	There are no petrol filling stations with an annual throughput of more than 2 million litres per year, near to a busy road (>30,000 vehicles per day), and within 10m of a sensitive receptor.
G) Major fuel storage depots (petrol only)	There are no major fuel depots within the Borough.
Conclusion	The assessment has indicated that the benzene objectives are unlikely to be exceeded at any location in the Borough, and therefore a Detailed Assessment for this pollutant will not be required.

2.3

1,3-butadiene

Checklist Item (from Box 4.2)	Updating and Screening Assessment
Monitoring Data A) Monitoring data	1,3-butadiene is not monitored within Surrey Heath.
Industrial Sources B) New industrial sources C) Industrial sources with substantially increased emissions, or new relevant exposure.	There are no new industrial processes within Surrey Heath or within neighbouring authorities, nor are there any industrial sources with increased emissions, or new relevant exposure to consider for the purpose of this assessment.
Conclusion	The assessment has indicated that the 1,3-butadiene objective is unlikely to be exceeded at any location in the Borough, and therefore a Detailed Assessment for this pollutant will not be required.

2.4

Lead

Checklist Item (from Box 5.1)	Updating and Screening Assessment
Monitoring Data A) Monitoring data	Lead is not monitored within Surrey Heath.
Industrial Sources B) New industrial sources C) Industrial sources with substantially increased emissions, or new relevant exposure.	There are no new industrial processes within Surrey Heath or in the neighbouring authorities, nor are there industrial sources with increased emissions, or new relevant exposure to consider for the purpose of this assessment
Conclusion	The assessment has indicated that the lead objectives are unlikely to be exceeded at any location in the Borough, and therefore a Detailed Assessment for this pollutant will not be required.

2.5

Nitrogen Dioxide

Checklist Item (from Box 6.2)	Updating and Screening Assessment
<p>Monitoring Data</p> <p>A) Monitoring data from outside an AQMA</p> <p>B) Monitoring data within an AQMA</p>	<p>Nitrogen dioxide is monitored within Surrey Heath using diffusion tubes and a continuous monitor located at Castle Road, Camberley.</p> <p>There is one AQMA declared in the Borough.</p> <p>Two diffusion tubes recorded an exceedence of the annual mean UK objective. One of these within the existing AQMA along the M3 corridor, although the other site is near Guildford Road, Bisley and is not within an AQMA.</p> <p>The continuous analyser located at within the AQMA at Castle Road recorded an annual mean of 47 µg/m³ in 2005. However, this exceedence is based on just 3 months' of monitoring.</p> <p>See Table 2, Appendix A for summaries of monitoring results.</p>
<p>Road Traffic-</p> <p>C) Narrow congested streets with residential properties close to the kerb</p>	<p>There has been no change since the previous USA. The High Street, Chobham, was assessed previously as the only significant narrow congested street. It was determined that the 2005 annual mean concentration of NO₂ would not exceed 36 µg/m³ in 2005. Diffusion tube monitoring has confirmed that concentrations are unlikely to exceed the NO₂ annual mean objective at this location.</p>
<p>D) Junctions</p>	<p>Since the previous USA, no new junctions with an AADT of over 10,000 and with relevant exposure within 10 m of the kerb have been identified. The previous USA predicted a maximum annual mean NO₂ concentration at a sensitive receptor near to the junction of A319 Chertsey Road/High Street, Chobham, as 38.7 µg/m³ in 2005.</p>
<p>E) Busy streets where people may spend 1 hour or more close to traffic</p>	<p>There has been no change since the previous USA. The High Street, Chobham, was assessed previously as the only significant busy street where people may spend more than one hour close to traffic. It was determined that the 2005 annual mean concentration of NO₂ would not exceed 36 µg/m³ in 2005. Diffusion tube monitoring has confirms that concentrations are unlikely to exceed the NO₂ annual mean objective at this location.</p>
<p>F) Road with high flow of buses and/or HGVs</p>	<p>There has been no change since the previous USA; there are no roads with unusually high flows of buses and/or HGVs (i.e. greater than 25%)</p>
<p>G) New roads constructed or proposed since the previous round of R &A</p>	<p>There have been no new roads constructed or proposed since the previous USA.</p>
<p>H) Roads with significantly changed traffic flows, or new relevant exposure.</p>	<p>No roads with an AADT of >10,000 have shown a significant increase (>25%) in traffic flow. There is no new relevant exposure.</p>
<p>I) Bus stations</p>	<p>There are no bus stations in Surrey Heath with relevant exposure within 10 m of the kerb.</p>
<p>Industrial Sources</p> <p>J) New industrial sources</p> <p>K) Industrial sources with substantially increased emissions, or new relevant exposure.</p>	<p>There are no new industrial processes within Surrey Heath or within neighbouring authorities, nor are there industrial sources with increased emissions, or new relevant exposure to consider for the purpose of this assessment.</p>

Other Sources L) Aircraft	There are no airfields or airports within the Borough with sufficient movements to exceed the threshold criteria.
Conclusion	<p>The assessment has indicated that the nitrogen dioxide objectives are likely to be exceeded at one location outside the existing AQMA. However, this single diffusion tube location is not representative of relevant public exposure. The continuous monitor near to this location, Guildford Road, Bisley, is more representative and has not recorded an exceedance.</p> <p>The assessment indicates that the existing AQMA is suitable, although it should be considered modifying or expanding the existing monitoring network on and near Guildford Road to reflect the potential for exceedance in this area.</p>

2.6

Sulphur Dioxide

Checklist Item (from Box 7.2)	Updating and Screening Assessment
Monitoring Data A) Monitoring data from outside an AQMA	Sulphur dioxide is not monitored within Surrey Heath; there is no AQMA within the Borough.
B) Monitoring data within an AQMA	
Industrial Sources C) New industrial sources	There are no new industrial processes within Surrey Heath or within neighbouring authorities, nor are there industrial sources with increased emissions, or new relevant exposure to consider for the purpose of this assessment.
D) Industrial sources with substantially increased emissions, or new relevant exposure.	
Domestic Sources E) Areas of domestic coal burning	There are no known areas where significant domestic coal (or smokeless fuel) burning takes place.
Boilers F) Small boilers $>5\text{MW}_{(\text{thermal})}$	There are no known boilers of greater than 5MW that burn coal or oil in the Borough.
Other Sources G) Shipping	None. The Borough is land-locked, and there are no busy waterways.
H) Railway :Locomotives	There are no locations where diesel locomotives are regularly stationary for 15 minutes.
Conclusion	The assessment has indicated that the sulphur dioxide objectives are unlikely to be exceeded at any location in the Borough, and therefore a Detailed Assessment for this pollutant will not be required.

2.7

PM₁₀

Checklist Item (from Box 8.4)	Updating and Screening Assessment
Monitoring Data	PM ₁₀ has been monitored at Guildford Road, Bisley, and is currently monitored at Castle Road, near the M3. The seasonally biased concentration recorded at Bisley in 2005 was 16 µg/m ³ , and the seasonally biased mean concentration of PM ₁₀ measured at Castle Road in 2005 was 19 µg/m ³ . There is no AQMA for PM ₁₀ currently declared in Surrey Heath.
A) Monitoring data from outside an AQMA B) Monitoring data within an AQMA	
Road Traffic- C) Busy roads or junctions in Scotland	N/A
D) Junctions	Since the previous USA, no new junctions with an AADT of over 10,000 and with relevant exposure within 10 m of the kerb have been identified. The previous USA predicted a maximum annual mean concentration, at a sensitive receptor near to the junction of A319 Chertsey Road/High Street, Chobham, of 28 µg/m ³ in 2004.
E) Roads with high flow if buses and/or HGVs	There has been no change since the previous USA; there are no roads with unusually high flows of buses and/or HGVs (i.e. greater than 20%)
F) New roads constructed or proposed since last round of R&A	There have been no new roads constructed or proposed since the previous USA.
G) Roads with significantly changed traffic flows, or new relevant exposure	No roads with an AADT of >10,000 have shown a significant increase (>25%) in traffic flow. There is no new relevant exposure.
H) Roads close to the objective during the second round of R&A	There were no roads close to the objective during the previous USA (the greatest number of exceedences predicted in 2004, at a sensitive receptor, was 5).
Industrial Sources	There are no new industrial processes within Surrey Heath or within neighbouring authorities, nor are there industrial sources with increased emissions, or new relevant exposure to consider for the purpose of this assessment.
I) New industrial sources J) Industrial sources with substantially increased emissions, or new relevant exposure.	
Domestic Sources K) Areas of domestic fuel burning	There are no known areas where significant domestic solid fuel burning takes place.
Other Sources L) Quarries/ landfill / opencast coal / handling of dusty cargo at ports etc	There are no landfill sites or opencast coal mines in the Borough. The only quarries are small sandstone quarries (where no regular quarrying takes place), with no exposure within 1000m.
M) Poultry Farms	There are no poultry farms in the Borough where it is thought likely that emissions of PM ₁₀ could contribute to exceedences of the PM ₁₀ objectives.
N) Aircraft	There are no airfields or airports within the Borough with sufficient movements to exceed the threshold criteria.
Conclusion	The assessment has indicated that the PM ₁₀ objectives are unlikely to be exceeded at any location in the Borough, and therefore a Detailed Assessment for this pollutant will not be required.

3 Conclusions

The criteria for each of the seven pollutants has been assessed according to the guidance contained within LAQM.TG(03), and its January 2006 update. It is concluded that the national air quality objectives for benzene, 1,3-butadiene, carbon monoxide, PM₁₀, sulphur dioxide and lead are unlikely to be exceeded at any location in the Borough, and therefore a Detailed Assessment will not be required for these pollutants.

This assessment has determined that the concentration of NO₂ is likely to exceed the UK annual mean objective at two locations in the Borough. The first location is within the existing AQMA, indicating that the extent of the AQMA is suitable and will not require a Detailed Assessment.

The second location where an exceedence has been recorded is near to the A322 Guildford Road, Bisley, although this is near the continuous monitor which more appropriately reflects the exposure of relevant receptors and indicates that there is not likely to be an exceedence in this area. It is recommended that the diffusion tube network in this area is increased or modified to include suitable receptors. A Detailed Assessment for NO₂ will not be required in this location.

4 References

Defra, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2000, <http://www.defra.gov.uk/environment/airquality/strategy/index.htm>

Defra, the Air Quality Strategy for England, Scotland, Wales and Northern Ireland: Addendum, 2003, <http://www.defra.gov.uk/environment/airquality/strategy/abbedndum/index.htm>

Defra, Local Air Quality Management, Policy Guidance LAQM.PG (03), 2003

Defra, Local Air Quality Management, Technical Guidance LAQM.TG (03), 2003

Defra, Local Air Quality Management, Technical Guidance LAQM.TG (03) Update, 2006

Defra, Local Air Quality Management, Technical Guidance LAQM.TG (03) Update Checklist, 2006

Surrey Heath Borough Council, Local Air Quality Updating and Screening Assessment, 2003

Appendix A: Monitoring Data

Table 2: NO₂ Diffusion Tube Monitoring Results

Site	Grid Ref	Site Type	2004 / µg/m ³	2005 / µg/m ³	2010 / µg/m ³
A30 Bagshot SH1	491111E 163461N	Kerbside	21.8	23.7	20.0
Windle Valley Daycare Centre SH2	491056E 163335N	Roadside	25.4	20.7	17.4
Snows Ride School Windlesham SH3	492810E 164408N	Urban Background	20.6	26.7	23.4
Shaftesbury Road Bisley SH4	494693E 159489N	Roadside	14.5	16.5	13.9
Crawley Hill Camberley SH5	489099E 160264N	Roadside	46.0	29.7	25.0
Church Lane Bisley SH6	494976E 159632N	Roadside	24.2	19.7	19.6
M3 Brickhill roadside SH7	496220E 164432N	Kerbside	47.2	45.9	38.6
M3 Brickhill 50m back SH8	496217E 164442N	Roadside	33.9	23.8	20.0
A30 Jolly Farmer SH9	489640E 161884N	Roadside	35.1	24.5	20.6
A30 Homebase SH10	485776E 160077N	Kerbside	30.3	36.7	30.9
Watchetts School Camberley SH11	486939E 158939N	Roadside	31.5	27.7	23.3
High Street Camberley SH12	487484E 160807N	Kerbside	39.9	23.2	19.5
Le Marchant Road SH13	488703E 159585N	Kerbside	37.5	35.0	29.4
Badgers Copse SH14	491111E 163461N	Kerbside	29.0	24.3	20.4
AQM Bisley SH15	495499E 158880N	Roadside	16.9	24.4	20.5
Wood Road SH16	486750E 158250N	Roadside	21.8	29.7	25.0
Guildford Road, Bisley SH17	495250E 159250N	Kerbside	35.1	43.2	36.3
Deepcut Bridge Road SH20	490389E 157280N	Kerbside	21.8	25.7	21.6
Benner Lane SH21	494750E 161250N	Urban Background	12.1	21.0	18.4
AQM Bisley SH22			20.6	24.2	20.4
Red Road/Maultway SH23	490710E 160438N	Kerbside	29.0	25.4	21.4
High Street, Chobham SH24	497341E 161734N	Kerbside	19.4	27.0	22.7
AQM Bisley SH25			19.4	26.9	22.6
College Ride, Camberley SH26	487684E 161363N	Urban Background	24.2	22.6	19.8

Note: Tube data has been bias adjusted based on co-location studies from Lambeth Scientific Services (50% TEA / acetone). Predicted concentration using guidance in LAQM TG(03).

Table 3: Continuous Monitoring Results, Guildford Road, Bisley (495499, 158880)

Period	NO ₂	PM ₁₀	
	µg/m ³	µg/m ³	Exceedences
Oct – Dec 2003	31	18	0
Jan – Dec 2004	23	16	1
Jan – April 2005	22	16	0

Note: PM₁₀ results are gravimetric equivalent.

Table 4: Seasonally Adjusted Continuous Monitoring Results, Guildford Road, Bisley

Period	NO ₂ / µg/m ³	PM ₁₀ / µg/m ³
2003 Mean ¹	38	20
2004 Mean	23	16
2005 Mean ¹	24	16
2010 Predicted Mean ²	20	16

Note: ¹Seasonally adjusted based on Harwell, Portsmouth and Canterbury AURN data using guidance in LAQM TG(03). ²Predicted concentration using guidance in LAQM TG(03). PM₁₀ results are gravimetric equivalent.

Table 5: Continuous Monitoring Results, Castle Road, Camberley (488634, 159799)

Period	NO ₂	PM ₁₀	
	µg/m ³	µg/m ³	Exceedences
Oct - Dec 2005	36	19	0
Jan - Feb 2006	39	21	0

Note: PM₁₀ results are gravimetric equivalent.

Table 6: Seasonally Adjusted Continuous Monitoring Results, Castle Road

Period	NO ₂ / µg/m ³	PM ₁₀ / µg/m ³
2005 Mean ¹	47	19
January 2006	40	22
February 2006	38	19
2010 Predicted Mean ²	40	17

Note: ¹Seasonally adjusted based on Harwell, Portsmouth and Canterbury AURN data using guidance in LAQM TG(03). ²Predicted concentration using guidance in LAQM TG(03). PM₁₀ results are gravimetric equivalent.

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Rev No	Comments	Date
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