



2011 Air Quality Progress Report for Hart District Council


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

July 2011

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Customer	Hart District Council
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AEA
 Glengarnock Technology Centre
 Caledonian Road
 Glengarnock
 Ayrshire
 KA14 3DD
 T: 0870 190 5301
 F: 0870 190 5151

AEA is a business name of
 AEA Technology plc
 AEA is certificated to ISO9001
 and ISO14001

Author	Name	Ben Pearson
	Name	Dr Scott Hamilton
Approved by	Signature	
	Date	14/07/2011

Local Authority Officer	Neil Hince
--------------------------------	------------

Department	Environmental Health Services
Address	Hart District Council, Civic Offices, Harlington Way Fleet, Hampshire, GU51 4AE
Telephone	01252 774421 ext 4280
e-mail	neil.hince@hart.gov.uk

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Executive Summary

This Air Quality Progress Report has been prepared for Hart District Council as part of the Local Air Quality Management (LAQM) system introduced in Part IV of the Environment Act 1995. The Local Air Quality Management Technical Guidance LAQM.TG (09) has been closely followed in the preparation of this report.

On the basis of this assessment, no further action is required in respect to pollutants:

- Nitrogen Dioxide;
- Particulate Matter;
- Carbon Monoxide;
- Benzene;
- 1-3, butadiene;
- Lead; and
- Sulphur Dioxide.

Analysis of the 2010 Nitrogen Dioxide (NO₂) and Particulate Matter (PM₁₀) monitoring data concluded that no further action is required, over and above that already in progress by Hart District Council. The 2010 data supports conclusions made during previous rounds of review and assessment.

New monitoring data has not identified the need to proceed to a Detailed Assessment for any pollutants outlined in this report.

Hart District Council's next objective in the LAQM process will be to submit the 2012 Updating and Screening Assessment.

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1 Introduction

1.1 Description of Local Authority Area

Hart District was formed in 1974 by the combination of Fleet Urban and Hartley Wintney Rural District Councils. The District lies in the north-east corner of Hampshire and is approximately 83 square miles in extent. The overall impression is that the District is rural, with a varied landscape made up of woodland, heathland common and arable land. The urban areas are concentrated in the north-east and east of the District around Yateley, Blackwater and Fleet. Hook is a recently expanded village on the western boundary.

The rest of the District's settlements are villages, particularly notable for their historically and architecturally important buildings. There are 32 Conservation Areas and nearly 1,000 listed buildings in the District.

From Hart's northern boundary with Berkshire, the land rises to the North Downs in the south of the District. Three small rivers cross the area flowing northwards into the River Thames, one of these, the Blackwater, forming part of the boundary with Surrey and Berkshire. The Whitewater flows from the western side into the River Hart, from which the District takes its name.

Figure 1.1 Map of Hart District showing major conurbations and transport links



1.2 Purpose of Progress Report

Progress Reports are required in the intervening years between the three-yearly Updating and Screening Assessment reports. Their purpose is to maintain continuity in the Local Air Quality Management process.

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 $\mu\text{g}/\text{m}^3$	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	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 $\mu\text{g}/\text{m}^3$	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

Hart District Council has completed the following review and assessments of air quality to date: Updating and Screening Assessment (April 2003); Progress Report 2004 (April 2004); Progress Report 2005 (April 2005); Updating and Screening Assessment (May 2006); Progress Report 2007 (June 2007); Progress Report 2008 (May 2008); and Updating and Screening Assessment (July 2009).

No air quality management areas have been declared by Hart District Council to date.

The latest USA (2009) report predicted that none of the objectives listed for pollutants in the UK Air Quality Strategy would be exceeded, but that the annual mean NO₂ concentrations measured at the Blackwater monitoring station were close to the objective and should be further assessed. The 2009 Updating and Screening Assessment concluded that NO₂ and PM₁₀ concentrations throughout the district were below the relevant objectives at all locations where monitoring took place in 2008. As such, it was concluded that Hart District Council were not required to proceed to a Detailed Assessment for any pollutants.

In 2010 Hart District Council published an Air Quality Progress Report which assessed PM₁₀ and NO₂ in the district from 2009 monitoring data. This supported the conclusions of previous assessments of air quality in the district, and confirmed that no further action was required with respect to air quality in the district.

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

Hart District Council has continued to monitor NO₂ and PM₁₀. The air quality objectives for NO₂ and PM₁₀ have been met throughout the District of Hart.

2.1.1 Automatic Monitoring Sites

Continuous monitoring of NO₂ and PM₁₀ has also taken place at Blackwater. The monitoring site is located adjacent to the A30 (London Road) at the junction with Vicarage Road. It is approximately 3 metres from the kerbside of a busy road. A PM₁₀ Tapered Element Oscillating Microbalance (TEOM) and NO_x chemiluminescent analyser are used at this site. This report presents the continuous monitoring results from January to December 2010 inclusively. The site location is shown in Figure 2.1 below.

Figure 2.1 Map of Automatic Monitoring Site

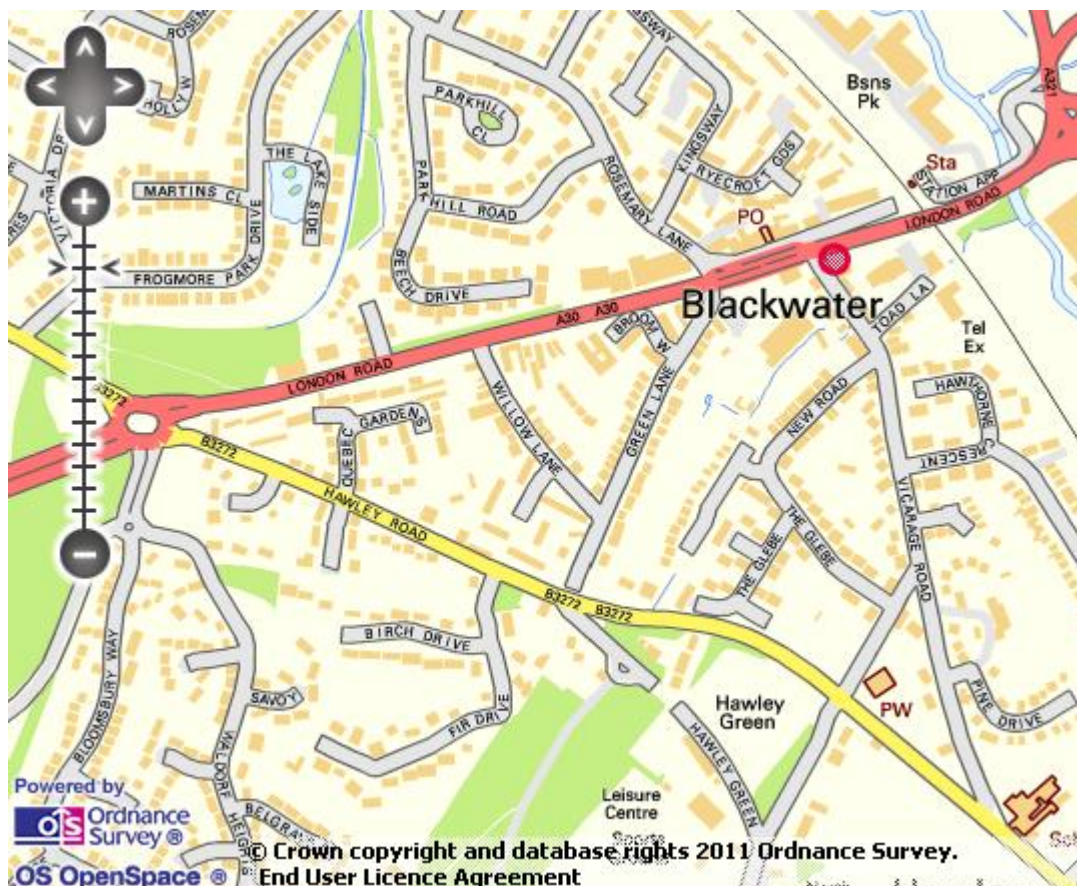


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	OS Grid Ref		Pollutants Monitored	Monitoring Technique	In AQMA?	Relevant Exposure? (Y/N with distance (m) to relevant exposure)	Distance to kerb of nearest road (N/A if not applicable)	Does this location represent worst-case exposure?
Blackwater	Kerbside	X485243	Y159806	NO ₂ , PM ₁₀	Chemiluminescent, TEOM	N	No Data	3m	No Data

2.1.1 Non-Automatic Monitoring Sites

Hart District Council undertakes passive NO₂ monitoring using diffusion tubes at 12 sites throughout the District. NO₂ is monitored at five kerbside, four roadside, and three background sites. Two background diffusion tubes are co-located at the Blackwater automatic monitoring site.

Gradko International Ltd prepared the diffusion tubes for both surveys using a procedure based on 20% triethylamine (TEA) in water.

Table 2.2 Details of Non- Automatic Monitoring Sites

Location	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?
Clover Leaf, Odiham	Roadside	X 7365 Y 5108	NO ₂	No	No Data	No Data	No Data
The Poachers, South Warnborough	Kerbside	X 7235 Y 4745	NO ₂	No	No Data	No Data	No Data
Hart Leisure Centre, Fleet	Roadside	X 7980 Y 5380	NO ₂	No	No Data	No Data	No Data
The Phoenix, Hartley Wintney	Kerbside	X 7482 Y 5554	NO ₂	No	No Data	No Data	No Data
Dorchester Arms, Hook	Kerbside	X 7145 Y 5340	NO ₂	No	No Data	No Data	No Data
Elvetham Heath	Kerbside	X 480305 Y 155907	NO ₂	No	No Data	No Data	No Data
Yateley Comprehensive	Background	X 8110 Y 6060	NO ₂	No	No Data	No Data	No Data
Bramshill Police College	Background	X 7485 Y 5905	NO ₂	No	No Data	No Data	No Data
M3 Northbound	Roadside	X 8005 Y 5600	NO ₂	No	No Data	No Data	No Data
Vicarage Road, Blackwater	Kerbside	X 8530 Y 5980	NO ₂	No	No Data	No Data	No Data
Blackwater (AQM 1)	Background	X 485243 Y 159806	NO ₂	No	No Data	No Data	No Data

Location	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?
Blackwater (AQM 2)	Background	X 485243 Y 159806	NO ₂	No	No Data	No Data	No Data
High Street, Fleet (Oatsheaf)	Roadside	X 480563 Y 153882	NO ₂	No	No Data	No Data	No Data

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

In urban areas the principal source of NO_x emissions (and therefore NO₂) is road transport, which accounted for about 25% of total UK emissions in 2009. Major roads carrying large volumes of high-speed traffic (such as motorways and other primary routes) are a predominant source, as are conurbations and city centres with congested traffic. Within most urban areas, the contribution of road transport to local emissions will be much greater than for the national picture.

Defra and the Devolved Administrations have adopted two Air Quality Objectives for NO₂, as an annual mean concentration of 40µg·m⁻³, and a 1-hour mean concentration of 200µg·m⁻³ not to be exceeded more than 18 times per year. The objectives are to be achieved by the end of 2005 and in subsequent years.

Table 2.4a summarises the measurements of NO₂ concentrations at the Blackwater continuous monitoring station. Table 2.4b highlights the number of 1-hour mean objective exceedences.

Automatic Monitoring Data

For 2010 the Blackwater site had no exceedences of the 1-hour mean objective and the annual mean concentration was 30.6µg·m⁻³. See Tables 2.4a and 2.4b for comparison with 2008 and 2009 monitoring results.

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

Site ID	Location	Within AQMA?	Relevant public exposure? Y/N	Data Capture for full calendar year 2010 %	Annual mean concentrations (µg/m ³)		
					2008	2009	2010
BL	Blackwater	N	N	95.8%	35.1	30.6	33.9

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

Site ID	Location	Within AQMA?	Relevant public exposure? Y/N	Data Capture for full calendar year 2010 %	Number of Exceedences of hourly mean ($200 \mu\text{g}\cdot\text{m}^{-3}$)		
					2008	2009	2010
BL	Blackwater	N	N	95.8%	0	0	0

Diffusion Tube Monitoring Data

The diffusion tubes were exposed for one-month periods, and the annual average NO_2 concentrations from January to December 2010 inclusive were determined at each location. The district wide network of NO_2 tubes consists of 13 diffusion tubes across the area.

The national bias adjustment factor spreadsheet suggested applying a correction factor of 0.92 to diffusion tubes in Hart in 2010.

A national bias correction factor of 0.90 was applied to all diffusion tube data for Hart District Council for 2009 and the results are presented alongside the 2010 data in tables 2.4a and 2.4b.

Using the national bias correction factor of 0.92 for 2010, results indicate that no diffusion tubes throughout Hart District measured NO_2 levels at or over the $40\mu\text{g}\cdot\text{m}^{-3}$ objective.

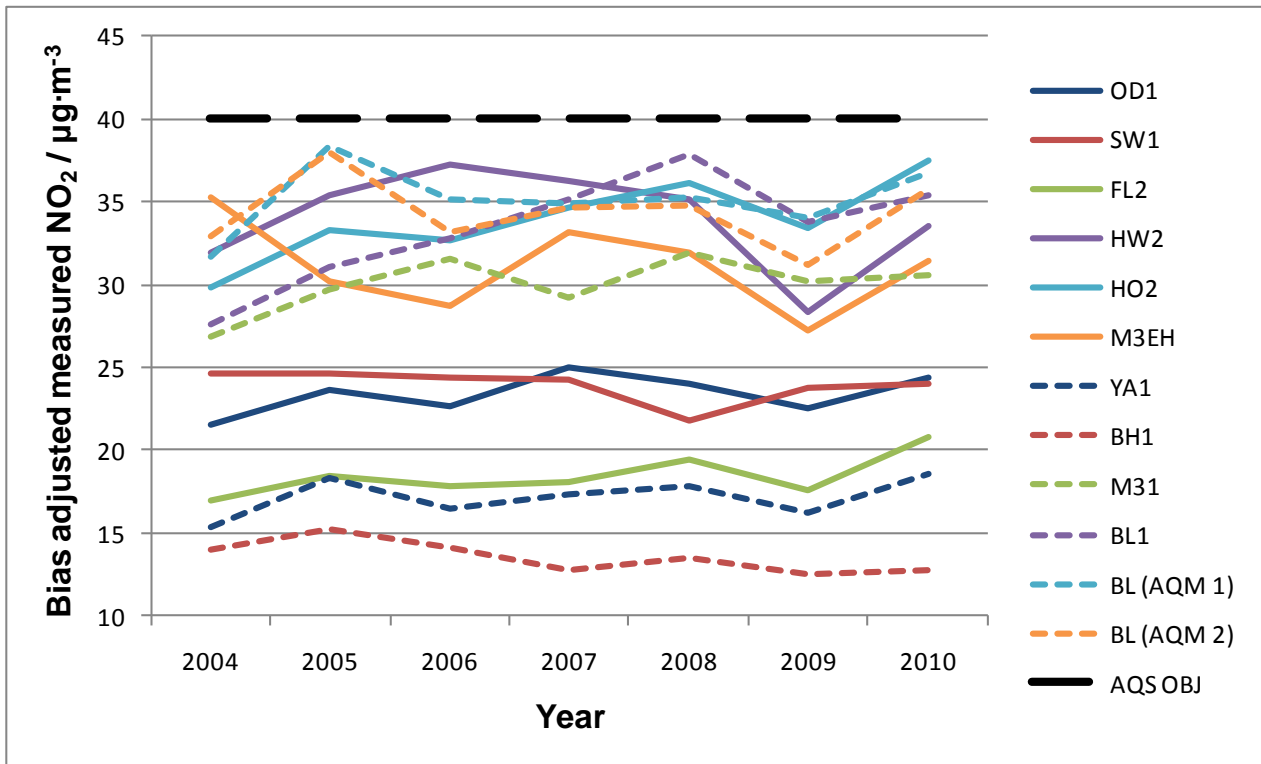
The highest annual mean concentration for diffusion tube readings recorded using nationally corrected tube data was $36.8\mu\text{g}\cdot\text{m}^{-3}$ for the diffusion tube located at the Blackwater (AQM 2) site.

On the basis of the new monitoring carried out by Hart District Council, no Detailed Assessment is required for NO_2 at any location.

Table 2.4 Results of Nitrogen Dioxide Diffusion Tubes

Site ID	Location	Within AQMA?	Relevant public exposure? Y/N	Data Capture for monitoring period %	Data Capture for full calendar year 2010 %	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)		
						2008	2009	2010
OD1	Clover Leaf, Odiham	No	No Data	97%	100%	24.0	22.5	24.4
SW1	The Poachers, South Warnborough	No	No Data	94%	100%	21.8	23.7	24.0
FL2	Hart Leisure Centre, Fleet	No	No Data	100%	100%	19.4	17.6	20.8
HW2	The Phoenix, Hartley Wintney	No	No Data	92%	100%	35.2	28.3	33.6
HO2	Dorchester Arms, Hook	No	No Data	94%	83%	36.2	33.4	37.4
M3EH	Elvetham Heath	No	No Data	94%	92%	31.9	27.2	31.5
YA1	Yateley Comprehensive, Yateley	No	No Data	100%	100%	17.8	16.3	18.6
BH1	Bramshill Police College, Bramshill	No	No Data	97%	100%	13.5	12.5	12.8
M31	M3 Northbound	No	No Data	100%	100%	31.9	30.2	30.6
BL1	Vicarage Road, Blackwater	No	No Data	94%	100%	37.9	33.7	35.4
BL (AQM 1)	Blackwater (AQM 1)	No	No Data	100%	100%	35.3	34.0	36.8
BL (AQM 2)	Blackwater (AQM 2)	No	No Data	100%	100%	34.8	31.2	35.7
HS1	High Street, Fleet (Oatsheaf)	No	No Data	100%	100%	31.7	28.8	34.3

Figure 2.4 Trends in Annual Mean Nitrogen Dioxide Concentration Measured at Diffusion Tube Monitoring Sites.



Data obtained from diffusion tube monitoring of NO₂ at the 12 sites in the district which have been active since 2004 show a slight overall increase in levels of NO₂ over time, although no sites have recorded significant increases or decreases in this period. The sites which have shown the most notable increase in NO₂ concentrations since 2004 are BL1 and HO2, at which levels have risen by an average of 1.2 and 1.0 µg·m⁻³ per year respectively. Since both of these sites currently record concentrations close to the AQS objective limit for NO₂, close consideration should be paid to levels of NO₂ at these locations in future assessments.

2.2.2 PM₁₀

The annual mean concentration recorded at the Blackwater automatic monitoring station was 19.3 $\mu\text{g}\cdot\text{m}^{-3}$, well below the annual mean objective for PM₁₀. There were 4 exceedences of the 24-hour mean objective during 2010, far fewer than the maximum of 35 permitted by the AQS objectives.

It is important to note that for the TEOM data collected during 2010 the Volatile Correction Model (VCM) has been applied to all measurements from the Blackwater site.

Table 2.5a Results of PM₁₀ Automatic Monitoring: Comparison with Annual Mean Objective

Site ID	Location	Within AQMA?	Data Capture for full calendar year 2010 %	Annual mean concentrations ($\mu\text{g}/\text{m}^3$)		
				2008	2009	2010
BL	Blackwater	N	90.4%	21.5	19.3	20.3

Table 2.5b Results of PM₁₀ Automatic Monitoring: Comparison with 24-hour Mean Objective

Site ID	Location	Within AQMA?	Data Capture for full calendar year 2010 %	Number of Exceedences of daily mean objective ($50 \mu\text{g}\cdot\text{m}^{-3}$)		
				2008	2009	2010
BL	Blackwater	N	90.4%	9	3	4

2.2.3 Summary of Compliance with AQS Objectives

Hart 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

3.1 Road transport Sources

Road-traffic data recorded by Hampshire County Council in 2010 indicated the following annual average daily traffic (AADT) on roads in Hart District. In all cases AADT has fallen since assessed in the 2006 Updating and Screening Assessment.

Table 3.1 Traffic Flow Data supplied for roads in Hart District

Road	AADT
A30 Hartley Wintney	12704
B3272 Eversley Cross	7670
A327 Eversley	11216
A3013 Fleet	20234
B3013 Beacon Hill Rd, Fleet	9409
A323 Norris Hill Rd, Fleet	10884
A327 Minley Rd North, West of M3 Jct 4A	12572

3.2 Summary

Hart District Council confirms that there are no new or newly identified local developments which may have an impact on air quality within the Local Authority area.

Hart District Council confirms that all the following have been considered –

- **Road traffic sources**
- **Other transport sources**
- **Industrial sources**
- **Commercial and domestic sources**
- **New developments with fugitive or uncontrolled sources.**

4 Local / Regional Air Quality Strategy

Hart District Council do not have a local/ regional air quality strategy due to the current national air quality standards being met across the district. However the council has signed the Nottingham Declaration on Climate Change. This declaration states that “Hart District Council acknowledges the increasing impact that climate change will have on our community during the 21st century and commits to tackling the causes and effects of a changing climate on our district.”

The objectives of Hart District Council’s Climate Change Strategy are:

- Reduce the Council’s carbon emissions; and
- To become community leaders in helping residents and businesses reduce their carbon emissions across the district.

To ensure the district is climate change ready the Council’s climate change strategy and action plan includes:

- Achieving a 10% reduction in carbon emissions by 2011;
- Monitoring and improving energy consumption in the Council’s Civic Offices;
- Monitoring and improving water consumption in the Council’s Civic Offices;
- Improving recycling within the district;
- Protecting key wildlife habitats and landscapes;
- Keeping residents up to date with education and information campaigns to raise awareness of the issues;
- Promoting home energy efficiency; and
- Taking measures to prevent flooding.

It should also be noted that wherever a measure from the Climate Change Strategy reduces the combustion of fuel a reduction in emissions of relevant pollutants will be realised.

5 Planning Applications

A number of planning applications have been approved by Hart District Council since the last Progress Report and are currently awaiting development or already under construction.

Planning approval has been granted and upheld for development of offices and associated infrastructure at Hartland Park, although construction is not thought to have commenced at the time of writing.

The large Edenbrook development of over 100 two to five bedroom houses has been constructed on a greenfield site near the town of Fleet, in Hitches Lane. Since this land is not located in a pre-existing urban setting the existing air quality is very good, with background NO₂ and PM₁₀ concentrations of around 11.5 µg·m⁻³ and 14.5 µg·m⁻³ respectively. The development does not therefore present any new exposure in areas of poor air quality, and is also unlikely to result in further emissions which might cause exceedence of the AQS objectives for NO₂ or PM₁₀.

Planning application approval has been granted for the modifications to plans for the erection of a 37 new dwellings as part of a recent development of 170 dwellings on the southern edge of Hartley. The background concentrations of NO₂ and PM₁₀ in the area prior to development were well below the AQS objectives for these pollutants, at 14.3 µg·m⁻³ and 15.9 µg·m⁻³ respectively, and the original development was not considered likely to lead to new exceedence of the objectives at locations of relevant exposure. Some concerns have been raised regarding increased traffic on local roads, however current traffic flows are well below levels which would be likely to seriously affect air quality in the area. Furthermore, modelling undertaken as part of the original assessment did not indicate significant impact on local traffic flows, and the amended application was not thought sufficiently altered to negate these findings.

Approval was granted in August 2010 for the construction of two data centres and enterprise units encompassing an area of 0.045 km², in conjunction with a variety of measures to mitigate the impact of increasing road traffic in the area agreed following road-transport impact assessments.

An application has been received for development of 150 residential properties on the former site of Guillemont Barracks. No approval has yet been granted for this application and details of this application will therefore be updated in the 2012 Updating and Screening report.

An application is currently pending approval for waste recycling operations at the site of Clarkes Farm, Yateley.

An application for planning approval to develop the site of the former Queen Elizabeth II barracks is currently pending decision from Hart District Council. The submitted plans propose demolition of existing structures and construction of 872 residential units, up to 7,500 square metres of employment floor-space, and associated local community and recreational facilities. The first phase of development, if approved, will also entail highway works, parking and landscaping. Further updated details of the progress of this application or development will be provided in the next Updating and Screening report, which is due to be published in 2012.

6 Local Transport Plans and Strategies

The Local Transport Plan (LTP) sets out the County Council's transport strategy for the period 2006-2011. The LTP aims to:

- Improve quality of life;
- Protect the environment; and
- Secure economic prosperity.

Hampshire County Council launched a number of important initiatives including the Climate Change Commission of Inquiry, another into the Personalisation agenda, its Rural Delivery Strategy. The County Council is also reviewing the approach to rural transport and community transport.

Major scheme funding is predominantly available through national and regional funding streams. The County Council is developing potential projects and policy initiatives to promote a transport system for Hampshire that will support the economic well-being of the county (its businesses and its international gateways), while protecting its unique environment.

The transport strategy is fully integrated within the wider decision-making of Hampshire County Council, its district councils, Local Strategic Partnerships, neighbours and other key stakeholders. The LTP describes the vision and objectives for transport and shows how these have been derived from wider corporate and stakeholder aspirations through a thorough and ongoing process of consultation.

The overarching transport strategy is based on a concept of reduce, manage and invest, which aims to tackle transport problems by the most cost-effective means. Separate strategies have been produced for four geographical areas in Hampshire, recognising their different transport needs and problems.

The LTP does not simply adopt regional and national policies without question. Instead, these policies have been adapted and extended to meet the needs and circumstances of Hampshire. In all cases, the transport strategy seeks to meet or exceed regional and national requirements.

7 Conclusions and Proposed Actions

7.1 Conclusions from New Monitoring Data

Hart District Council undertook extensive monitoring of NO₂ throughout the district in 2010 by use of diffusion tubes at 12 locations and automatic monitoring at the Blackwater AURN site. Data recorded from these sites indicated that NO₂ concentrations at all 12 were below the AQS objective limit of 40 µg·m⁻³. The highest concentrations recorded in the district were from kerbside sites at the Dorchester Arms, Hook, Vicarage Road, Blackwater, and the Blackwater AURN monitor, however none of these recorded annual mean concentrations higher than 37.4 µg·m⁻³. It is therefore possible to conclude that the AQS annual mean objective for NO₂ was not exceeded in 2010.

Monitoring of PM₁₀ was also undertaken at the Blackwater AURN site, which recorded 4 exceedences of the daily mean objective, and no exceedence of the annual mean objective for PM₁₀.

7.2 Conclusions relating to New Local Developments

Hart District Council have not identified any new local developments which are likely to cause exceedence of the AQS objectives, either by affecting local air quality, or by introducing new relevant exposure in areas of existing poor air quality.

7.3 Proposed Actions

This Progress report has not identified any reasons for Hart District Council to conduct a Detailed Assessment of Air Quality in 2010. The next course of action should therefore be to complete an Updating and Screening Assessment in 2012 as per the UK LAQM guidance.

8 References

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Appendices

Appendix A: Bias Adjustment and QA/QC Process

Appendix B: Raw Diffusion Tube Data

Appendix A: Bias Adjustment and QA/ QC Process

Supplier/ Analyst: Gradko

Preparation Method: 20% TEA in Water

National Bias Adjustment Factor: 0.92

Factor from Local Co-location Studies (if available)

No co-location studies were carried out by Hart District Council during 2010.

Discussion of Choice of Factor to Use

The National Bias Adjustment Factor was used as there is no triplicate site in Hart that could have been used to calculate local Bias Adjustment Factor. A National Bias Adjustment Factor of 0.92 was applied to all uncorrected diffusion tube annual mean values. The National Spreadsheet of Bias Adjustment Factors (v.04/11) is shown below.

Figure A.1 Bias adjustment factor used for 2010 diffusion tube results

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 04/11			
Follow the steps below in the correct order to show the results of relevant co-location studies Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet This spreadsheet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.							This spreadsheet will be updated in late June 2011 on the LAQM Helpdesk Website			
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.							Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.			
Step 1:	Step 2:	Step 3:	Step 4:							
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor ² shown in blue at the foot of the final column.							
If a laboratory is not shown, we have no data for this laboratory.	If a preparation method (P) not shown, we have no data for this method at this laboratory.	If a year is not shown, we have no data.	If you have your own co-location study then see footnote ¹ . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953							
Analysed By ¹	Method ²	Year ³	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁴	Bias Adjustment Factor (A) (Cm/Dm)
Gradko	20% TEA in Water	2010	UC	Nottingham CC	12	40	40	-1.0%	G	1.01
Gradko	20% TEA in Water	2010	R	Nottingham CC	12	45	43	4.9%	G	0.95
Gradko	20% TEA in Water	2010	R	Nottingham CC	12	44	41	6.3%	G	0.94
Gradko	20% TEA in Water	2010	K	South Lakeland DC	12	46	42	8.1%	G	0.92
Gradko	20% TEA in Water	2010	R	Geedling BC	12	43	39	9.1%	G	0.92
Gradko	20% TEA in Water	2010	B	East Hertfordshire DC	12	21	16	31.2%	G	0.76
Gradko	20% TEA in Water	2010	R	Dudley MBC	12	42	45	-5.9%	G	1.06
Gradko	20% TEA in Water	2010	B	Dudley MBC	12	30	30	0.0%	G	1.00
Gradko	20% TEA in Water	2010	R	Dudley MBC	10	47	46	2.4%	G	0.98
Gradko	20% TEA in Water	2010	R	Carlisle CC	12	41	33	25.5%	G	0.80
Gradko	20% TEA in Water	2010	UC	Nottingham CC	12	40	40	-1.0%	G	1.01
Gradko	20% TEA in Water	2010	R	Nottingham CC	12	45	43	4.9%	G	0.95
Gradko	20% TEA in Water	2010	R	Nottingham CC	12	44	41	6.3%	G	0.94
Gradko	20% TEA in Water	2010	UC	Belfast CC	11	38	35	8.4%	P	0.92
Gradko	20% TEA in Water	2010	UB	Luton Borough Council	12	37	34	9.8%	G	0.91
Gradko	20% TEA in Water	2010	K	Wandsworth Council	11	136	162	-16.4%	G	1.20
Gradko	20% Tea in Water	2010	UB	Wandsworth Council	12	47	53	-9.9%	P	1.11
Gradko	20% TEA in Water	2010	R	Newtownabbey BC	11	36	35	4.3%	G	0.96
Gradko	20% TEA in Water	2010	R	Cheshire East Council	12	58	45	29.2%	G	0.77
Gradko	20% TEA in Water	2010	R	Cheshire East Council	11	30	30	-1.8%	G	1.02
Gradko	20% TEA in Water	2010	R	Gateshead Council	9	38	34	10.4%	G	0.91
Gradko	20% TEA in Water	2010	R	Gateshead Council	9	35	33	6.0%	G	0.94
Gradko	20% TEA in Water	2010	R	Gateshead Council	9	34	34	-0.6%	G	1.01
Gradko	20% TEA in Water	2010	R	Gateshead Council	9	32	35	-9.9%	G	1.11
Gradko	20% TEA in Water	2010	R	Gosport BC	10	31	23	35.3%	na	0.74
Gradko	20% TEA in Water	2010	R	Rhondda Cynon Taf CBC	10	35	35	0.4%	G	1.00
Gradko	20% TEA in Water	2010	O	North Warwickshire BC	9	48	42	13.6%	P	0.88
Gradko	20% TEA in Water	2010	UB	LB Ealing	10	39	41	-3.8%	G	1.04
Gradko	20% TEA in Water	2010	R	South Norfolk Council	9	28	17	63.7%	G	0.61
Gradko	20% TEA in Water	2010	B	Chelmsford BC	11	16	17	-5.3%	G	1.06
Gradko	20% TEA in Water	2010	R	Chelmsford BC	12	33	21	55.0%	G	0.65
Gradko	20% TEA in Water	2010	R	Chelmsford BC	10	37	32	14.6%	G	0.87
Gradko	20% TEA in Water	2010	R	Wokingham BC	10	37	36	4.1%	G	0.96
Gradko	20% TEA in Water	2010	R	West Dunbartonshire Council	9	22	22	0.1%	G	1.00
Gradko	20% TEA in Water	2010	R	Scarborough BC	12	35	29	18.2%	G	0.85
Gradko	20% TEA in Water	2010	UB	Sandwell MBC	11	31	28	11.4%	na	0.90
Gradko	20% TEA in Water	2010	R	Sandwell MBC	11	45	45	-0.9%	na	1.01
Gradko	20% TEA in Water	2010	R	Sandwell MBC	11	37	36	2.0%	na	0.98
Gradko	20% TEA in Water	2010	UB	Sandwell MBC	10	22	21	8.1%	na	0.93
Gradko	20% TEA in Water	2010		Overall Factor² (39 studies)					Use	0.92

PM Monitoring Adjustment

The VCM has been applied to TEOM recorded readings from the Hart District Council Blackwater site. Casella confirmed that the data provided to HDC was raw data and therefore had not been corrected during 2010 using the 1.3 correction factor.

QA/QC of automatic monitoring

The QA/QC procedures follow the requirements of LAQM.TG (09) and are equivalent to those used at UK National Network (AURN) monitoring sites. This gives a high degree of confidence in the data obtained, both for reliable concentrations at the automatic sites and for bias correction data for the diffusion tube co-location study.

In order to satisfy the requirement outlined in the LAQM.TG (09), the following QA/QC procedures were implemented:

- 3-weekly calibrations of the NO_x analyser,
- 6-monthly audits and servicing of the monitoring site,
- Data ratification.

Calibrations of the NO_x analyser were carried out using certified compressed gas standards (ISO17025). This ensured that the calibration gas was traceable to national and international standards. In addition to the calibration sample filters were changed for both NO_x and TEOM analysers and any faults were identified thus minimising data loss.

Audits of the monitoring site consisted of a number of performance checks to identify any faults with the equipment. The calibration cylinder was also checked against another gas standard in order to confirm the gas concentration. Any identified faults were forwarded on to the service unit for repair.

The final stage of the QA/QC process was to ratify the data. During ratification, all calibration, audit and service data are collated and the data is appropriately scaled. Any suspect data identified are deleted therefore ensuring that the data are of a high quality.

QA/QC of diffusion tube monitoring

The Workplace Analysis Scheme for Proficiency (WASP) is an independent analytical performance-testing scheme, operated by the Health and Safety Laboratory (HSL). WASP formed a key part of the former UK NO₂ Network's QA/QC, and remains an important QA/QC exercise for laboratories supplying diffusion tubes to Local Authorities for use in the context of LAQM. The laboratory participants analyse four spiked tubes, and report the results to HSL. HSL assign a performance score to each laboratory's result, based on their deviation from the known mass of nitrite in the analyte.

The Performance criteria are due to be changed, at present the criteria are based on the z-score method, and equates to the following:

- GOOD: Results obtained by the participating laboratory are on average within 13% of the assigned value. This equates to a Rolling Performance Index (RPI) of 169 or less.
- ACCEPTABLE: Results obtained by the participating laboratory are on average within 13- 26% of the assigned value. This equates to an RPI of 169 - 676.
- WARNING: Results obtained by the participating laboratory are on average within 26 – 39% of the assigned value. This equates to an RPI of 676 - 1521.
- FAILURE: Results obtained by the participating laboratory differ by more than 39% of the assigned value. This equates to an RPI of greater than 1521.

However from April 2010, the criteria were based upon the Rolling Performance Index (RPI) statistic and will be tightened to the following:

- **GOOD:** Results obtained by the participating laboratory are on average within 7.5% of the assigned value. This equates to an RPI of 56.25 or less.
- **ACCEPTABLE:** Results obtained by the participating laboratory are on average within 15% of the assigned value. This equates to an RPI of 225 or less.
- **UNACCEPTABLE:** Results obtained by the participating laboratory differ by more than 15% of the assigned value. This equates to an RPI of greater than 225.

Appendix B: Raw Diffusion Tube Data

Table B.1 Diffusion tube results from 2010 in Hart District

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Clover Leaf, Odiham	18.62	16.63	13.05	15.51	11.14	11.14	8.44	10.09	11.08	13.46	20.49	16.91
The Poachers, South Warnborough	18.98	18.51	13.36	14.19	7.68	7.68	12.37	0.08	15.2	17.39	19.92	18.45
Hart Leisure Centre, Fleet	16.33	15.08	9.84	10.47	6.73	6.73	7.54	8.19	9.62	13.39	19.18	18.73
The Phoenix, Hartley Wintney	22.48	2.14	19.57	21.23	14.82	14.82	20.57	18.6	21.44	25.34	25.72	22.49
Dorchester Arms, Hook	24.41	24.39	20.2	21.7	No Data	No Data	16.46	17.59	19.58	21.6	25.37	21.74
Elvetham Heath	23.4	21.25	No Data	20.53	14.99	14.99	10.72	15.63	14.73	16.89	22.74	21.23
Yateley Comprehensive	16.69	15.77	9.24	9.4	5.36	5.36	5.55	6.61	8.74	11.39	17.55	15.07
Bramshill Police College, Bramshill	10.85	9.86	5.92	6.59	4.68	4.68	5.15	5.61	5.92	8.32	9.99	9.72
M3 Northbound	19.75	20.84	19.18	17.45	12.97	12.97	17.1	16.34	17.85	17.9	17.96	18.32
Vicarage Road, Blackwater	26.44	26.02	20.68	21.72	13.13	13.13	15.39	16.47	18.91	20.55	24.28	25.17
Blackwater (AQM 1)	25.86	24.64	18.73	23.18	18.18	18.18	14.41	16.49	17.85	22.61	29.87	21.28
Blackwater (AQM 2)	24.02	23.17	19.2	23.26	16.22	16.22	13.84	18.16	18.74	19.63	26.11	25.35
High Street, Fleet (Oatsheaf)	26.22	27.38	16.04	20.61	15.58	15.58	10.94	17.22	14.65	20.63	27.19	22.44