



# 2016 Air Quality Annual Status Report (ASR)

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

Date September 2016



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## Executive Summary: Air Quality in Our Area

### Air Quality in East Herts Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas<sup>1,2</sup>.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion<sup>3</sup>.

East Herts is the most rural district in the County and has a great deal of natural and built heritage in the combination of villages and market towns. Although the district's countryside character means it has an important agricultural base, the local economy is dominated by the service sector with the majority of the firms being small and medium sized enterprises.

There are 3 areas in East Herts where a combination of traffic congestion and road layout had led to Nitrogen Dioxide concentrations being above the objective set by the EU. These areas are known as Air Quality Management Areas. East Herts Council has written a joint action plan with Herts County council to identify measures that can be taken to improve the air quality in these areas.

East Herts Council have been monitoring air pollution at various locations around the district since the LAQM regime began in 1995. Diffusion tubes are predominantly used for monitoring but there have also been 2 continuous monitoring stations located in Sawbridgeworth. The data from both continuous analysers are managed by an external data management company. Each year the company carries out analysis of the data including long term monitoring trends and presents the results in

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<sup>1</sup> Environmental equity, air quality, socioeconomic status and respiratory health, 2010

<sup>2</sup> Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

<sup>3</sup> Defra. Abatement cost guidance for valuing changes in air quality, May 2013

an annual report. These can be found on the Herts and Beds Air Quality Monitoring website. [www.hertsbedsair.net](http://www.hertsbedsair.net) .

In the first few years within the last 5 years there has been a slight increase in the concentrations of Nitrogen Dioxide at most diffusion tube monitoring locations followed by a slow decline. However, as can be seen in the chart 1 in S3.21 the changes in annual mean are not significant and it would be hasty to determine the reduction in concentrations as a result of a reduction in traffic emissions and not other environmental factors such as weather. East Herts Council will continue to monitor Nitrogen Dioxide at these locations to determine whether this is the beginning of a longer term improvement in air pollution.

## **Actions to Improve Air Quality**

As discussed previously the three AQMAs in East Herts are as a consequence of congestion on very busy roads. The concentrations at the Hockerill Junction AQMA in Bishop's Stortford are increased by the street canyon affect provided by the road being flanked by buildings which are taller than its width. This has led to the conclusion that very little can be done to the road network within the area itself and the air can only be improved by reducing the amount of traffic that passes through the AQMA.

East Herts Council has applied for a number of defra grants over the past five years to determine best methods of reducing air pollution and also put in place measures to encourage modal shift from cars to a more sustainable mode of travel such as walking and cycling.

- In 2012 TRL was commissioned by Herts and Beds Air Quality Network to study the affect of 5 schools on nearby AQMAs. The information gained from the study was used to devise a calculator. Each school can now determine the consequence of their school journeys on air quality locally and how changing their parents' mode of travel could reduce pollution.
- In 2014 Herts County Council in partnership with East Herts Council held a sustainable travel campaign. The purpose of the campaign was to encourage

sustainable behaviour change to a large number of employees at Herts County Council and East Herts Council as well as three local schools. This involved installing bike/scooter racks at three schools and Hartham leisure centre. The East Herts Council bike rack was made more secure as staff were afraid to use it as bikes had been stolen in the past. A number of public and staff leaflets and fluorescent rucksack covers were handed out and events were used to highlight the sustainable transport message.

- East Herts Council and Herts County Council have worked together to improve 2 of the underpasses which link the town severed by the A414. The existing underpasses are underused because they are perceived as being unsafe, drab and dirty. The council commissioned community clean to install a full colour wall wrap system to the subway utilising artwork from local school children. The new subway wrap has only been in place for just over a year therefore final conclusions cannot yet be drawn without more qualitative and quantitative evidence. It is too early to say yet whether there are likely to be reductions in pollutant concentrations, as this study is looking at behaviour change from using the car for local journeys to replacing journeys with walking and cycling journeys to work, school and other essential services. Early indications show that pedestrian footfall has increased and anecdotal evidence shows that everyone who has seen the artwork is very impressed with the improvement in the journey experience, and they will change their journey patterns to sustainable mode.
- Working with the London Sustainability exchange and 2 local secondary schools on developing a teaching pack for secondary schools. Cleaner Air 4 Secondary Schools (CA4SS) is a multiple-disciple project designed alongside the school curriculum, with the aim of raising awareness and stewardship of air quality among the school community. With students learning the skills and behaviours they need for an independent, healthy lifestyle, schools are an ideal environment for creating lasting change in people's attitudes towards air quality. CA4SS can be easily integrated into science and geography programmes, enriching the schools' approach to the national curriculum to boost further education and future employment prospects. It is our intention to continue this project at another school, probably one next to the AQMA in Bishop's Stortford.

- In 2016 East Herts Council published a study on Car Park Based Low Emission Options to Support East Herts Air Quality Action Plan. This study was concerned with examining how road transport emissions can be reduced by influencing the type and performance of vehicles accessing car parks in Hertford and Bishop's Stortford. If measures to improve emissions and air quality are pursued, it is hoped that these will complement car parking initiatives already reported in documents such as Hertfordshire County Council's Local Transport Plan 2011 – 2031, Hertfordshire County Council's County & District Air Quality Action Plan and Parking and Transport Strategy.

## **Local Priorities and Challenges**

Local media coverage has increased the profile of air pollution within East Herts Council and also in the district itself.

- **Improve AQAP**  
It is clear that the AQAP which was developed for the Bishop's Stortford and Hertford AQMAs is out of date. The main priority for East Herts will be to review the current AQAP and produce a new and improved AQAP. The new plan will also include actions for the new AQMA in Sawbridgeworth. The challenge will be to engage other parties within East Herts and other agencies such as Herts County Council to ensure that all possible actions have been considered for the plan.
- **Working with Planning Policy**  
Environmental Health has been working with the Planning Policy team to ensure that Air and Air Quality Policy is included in the Local Plan. To support this Policy East Herts Council are developing an Air Quality Planning Guidance Document which defines the Council's expectations of developers to ensure a consistent approach. It will set the criteria for when an Air Pollution Assessment is required and a range of mitigation options which should be considered for approval.

## **How to Get Involved**

The council is working with other organisations to improve air quality but we can all make small changes to help make a big difference.

East Herts Council residents can get involved by considering whether or not they can make small changes to their lifestyle that would help the environment.

Ideas to consider are:

- Driving more smoothly and turning our engines off when stationary for longer than a minute or so
- If it's a short journey, consider walking or cycling. Even if this is only carried out on days where the weather is fair, it will contribute to the lowering of emissions and also improve health and wellbeing.
- Families with more than one car may want to consider if they could have a smaller second car or even an electric one.
- Consider whether or not you can take public transport.

Websites to explore for further information are

1. <http://www.energysavingtrust.org.uk/travel/driving-advice>. Web page on fuel efficient driving
2. <https://goultralow.com/> a central government website about low emission vehicles
3. <http://www.travelinesoutheast.org.uk> a journey planner that can plan door-to-door journeys across the whole of England, Scotland and Wales by public transport. An app is also available from the Apple App Store or Google Play Store as appropriate
4. Maps and routes for walking and cycling are available from Hertfordshire County Council. [www.hertsdirect.gov.uk](http://www.hertsdirect.gov.uk)

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## 1 Local Air Quality Management

This report provides an overview of air quality in East Herts Council during 2015. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) 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 an exceedance is considered likely the local authority must 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. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by East Herts Council to improve air quality and any progress that has been made.

The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

## 2 Actions to Improve Air Quality

### 2.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of the objectives.

A summary of AQMAs declared by East Herts Council can be found in Table 2.1.

Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at [https://uk-air.defra.gov.uk/aqma/local-authorities?la\\_id=89](https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=89)

**Table 2.1 – Declared Air Quality Management Areas**

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
AQMA 1 Hockerill Junction,	NO <sub>2</sub> annual mean	Bishop's Stortford	An area encompassing a number of properties at crossroads known as Hockerill Junction	Air Quality Action Plan <a href="http://www.eastherts.gov.uk/article/9550/Air-Quality">http://www.eastherts.gov.uk/article/9550/Air-Quality</a>
AQMA 2 Gascoyne Way	NO <sub>2</sub> annual mean	Hertford	Residential properties by the A414 from the junction with Mimram Road to the junction with Railway Place. Also includes properties along the first 450m of London Road and along the road beginning with Parliament square up to and including St Andrew's Street and approximately half of North Road. It also extends up Old Cross and Cowbridge until the junction with Port Vale.	Air Quality Action Plan <a href="http://www.eastherts.gov.uk/article/9550/Air-Quality">http://www.eastherts.gov.uk/article/9550/Air-Quality</a>

AQMA Name	Pollutants and Air Quality Objectives	City / Town	One Line Description	Action Plan
AQMA 3 London Road	NO <sub>2</sub> annual mean	Sawbridgeworth	Residential Properties along Cambridge Road from and including The Bull public house including properties along London Road and Bonk Hill up to the junction with High Wych Road.	Not yet published

## 2.2 Progress and Impact of Measures to address Air Quality in East Herts Council

East Herts Council has taken forward a number of measures during the current reporting year of 2016 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

East Herts Council expects the following measures to be completed over the course of the next reporting year:

1. Set up a steering group to write and AQAP for the AQMA in Sawbridgeworth and to improve the AQAP for the AQMAs in Hertford and Bishop's Stortford. The review would also result in an independent AQAP for East Herts using the new template provided by Defra. The steering group will first meet in October 2016 where it is anticipated that all parties will bring results of relevant projects so that we may establish what the best possible actions would be to reduce air pollution within the district. The new and improved AQAP should be easier to monitor and report on to Defra and other interested parties.
2. To work with Planning Policy to set up a supplementary planning document to support policy EQ4 of the Local Plan. The document will compel all developers to provide some mitigation measures when constructing within the district. The number of mitigation measures will depend on the scale of the development.

**Table 2.2 – Progress on Measures to Improve Air Quality**

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
1	Reduce queuing traffic at Hockerill Junction	Traffic Management	UTC, Congestion management, traffic reduction	Herts County Council	Model options including turning bans etc.	2007	2007		Completed Modelling identified that the junction could not be improved.		
2	Support the Goods Yard Link Road	Transport Planning and Infrastructure	Public transport improvements interchanges stations and services	East Herts council		2007			The Eastern Herts Transport Plan 2007 includes a strategy for pursuing the goods yard link		Good Yard Planning application has been submitted. However the link road has not been included.
3	Develop a bid for Bishop's Stortford station to be part of pilot station travel plan programme	Promoting Travel Alternatives	Promote use of rail and inland waterways	Herts County Council					A bid has been submitted to DfT		
4	Investigate better signage for the bypass with a view to reducing the impact of through traffic.	Traffic Management	UTC, congestion management and traffic reduction	Herts County Council			Reduction in traffic flows especially HGVs				

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
5	Consider options for Park and Ride scheme	Alternatives to Private Vehicle Use	Bus based Park and Ride	East Herts Council	The Eastern Plan 2007 includes a strategy for Park and Ride facilities	Studies undertaken so far have indicated that it would not be viable to introduce park and ride to Bishop's Stortford or Hertford			Completed		Studies undertaken so far have indicated that it would not be viable to introduce park and ride to Bishop's Stortford or Hertford
6	Undertake improvements to signal equipment with a view to improving efficiency e.g. investigate the use of an Urban Traffic Control System	Transport Planning and Infrastructure			The Eastern Herts Transport Plan 2007 includes strategies for ITS including VMS signs and an internet site (congestion, parking availability) Town Centre urban traffic control including signalised junctions/SCOOT cells.		Reduction in Traffic Flows				
7	Investigate the opportunities to improve bus infrastructure along the bus routes through each AQMA	Transport planning and infrastructure	Public transport improvements interchanges stations and services		East Herts Quality Bus Stop works		Could have positive impact upon accessibility and bus patronage			2008	

East Herts Council

Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
8	Check status of school travel plans for those schools located in the vicinity of each AQMA	Promoting Travel Alternatives	School Travel Plans	East Herts council	Assess the existing travel plans to 5 schools in the Herts and Beds region (Morgan's School, Hertford)	Use this information to devise a calculator to assess the effects of school travel on AQMAs and demonstrate the effects of modal shift	Reduction in NO <sub>x</sub>		Completed		
9	Devise a toolkit for 16 – 18 year olds to raise awareness of air pollution whilst working towards a British Science Association Crest Award	Promoting Travel Alternatives	School Travel Plan	East Herts Council			Increase in sustainable travel to school				
10	Promote the Benefits of Cycling	Promoting Travel alternatives	Promotion of cycling	East Herts Council	Install Cycle/scooter storage at 3 schools near the AQMA. Also upgrade the bicycle racks at East Herts Council as Staff were uncomfortable using it for security reasons.		Increased sustainable travel to school and work		2012	2013	Cycle/scooter Storage installed at all sites

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
11	Travel Stall in Hertford market. This was a one-off stall at the Hertford weekly market, to promote eco-friendly travel. Visitors to the stall were able to pick up the Hertford Travel Leaflet, and details on local health walks, and cycling information. Free fluorescent rucksack covers were given away.	Promoting Travel Alternatives	Intensive active travel campaign and infrastructure	Herts County Council and East Herts Council			Increased sustainable travel to school and work		Complete		Maps are still available at public buildings
12	Consider further improvements to the bypass with a view to reducing the impact of through traffic			Herts County Council	Little Hadham Bypass has been shortlisted as part of the Local Transport Body list of priority schemes. This, if successful would receive funding for 2015/19	Little Hadham Bypass is going through the planning application stage. EHC to discuss implications on the AQMA with the traffic modelling team.	Reduction in traffic through the Hockerill Junction				



Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
13	Hertfordshire Year of Cycling ran from May 2014 to late summer 2015 and will see a massive boost in the awareness of cycling and how the people of Hertfordshire can better integrate it with their lives.	Promoting Travel Alternatives	Promotion of Cycling	Herts County Council	The Year of Cycling comprised a fantastic range of events and cycling promotions so be sure to get involved and let us know how we can help you use a bike to improve your quality of life.	Hertfordshire Cycling website including dates of events, cycling routes and details of clubs and guided cycle rides.	Increase in number of people cycling				
14	Hertfordshire Year of Walking ran throughout 2015 and beyond. The project aims to inspire and motivate more people in the county to walk, whether that's for exercise, to explore the countryside or simply getting from A to B.	Promoting Travel Alternatives	Promotion of Walking	Herts County Council	Working with schools, businesses and existing walking groups, as well as organising exciting walking events across the county, to get more people on their feet!	Hertfordshire Year of walking website including dates of events, walking programmes and maps.	Increase in number of people walking				

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Measure No.	Measure	EU Category	EU Classification	Lead Authority	Planning Phase	Implementation Phase	Key Performance Indicator	Target Pollution Reduction in the AQMA	Progress to Date	Estimated Completion Date	Comments
15	Encourage the use of Euro 6 engines in buses that run in Bishop's Stortford.'			Herts County Council	Herts County Council to find out what Euro rating the HCC contract buses have that run in Bishop's Stortford.		Cleaner buses travelling through AQMA				

## 2.3 PM<sub>2.5</sub> – Local Authority Approach to Reducing Emissions and or Concentrations

As detailed in Policy Guidance LAQM.PG16 (Chapter 7), local authorities are expected to work towards reducing emissions and/or concentrations of PM<sub>2.5</sub> (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM<sub>2.5</sub> has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

East Herts Council is taking the following measures to address PM<sub>2.5</sub>:

1. Extend the AQAP to include actions that would improve air pollution across the district and not just within the AQMAs.
2. Assist Hertfordshire County Council to achieve the main aim outlined in the Active Travel Strategy which is *“To increase the proportion of journeys made by walking or cycling to improve individual health, quality of life, the environment and the economy”* <http://www.hertfordshire.gov.uk/docs/pdf/a/ATS2013.pdf>.
3. Encourage council employees and visitors to the council to use more sustainable methods of travel.
4. Monitor PM<sub>2.5</sub> in East Herts. Hertfordshire County Council’s public health department provided funding to all 10 district council’s to purchase a monitor to measure PM<sub>2.5</sub> in their area. East Herts Council has purchased a Beta Attenuation Monitor (BAM) and it is located in the new Air Quality Monitoring Station next to the car park on Gascoyne Way within the AQMA in Hertford. It has been envisaged that these network of monitors would be able to inform both public health and East Herts Council of any improvements made to PM<sub>2.5</sub> levels in their area.

## **3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance**

### **3.1 Summary of Monitoring Undertaken**

#### **3.1.1 Automatic Monitoring Sites**

This section sets out what monitoring has taken place and how it compares with objectives.

East Herts Council undertook automatic (continuous) monitoring at 3 sites during the first 5 months of 2015. However due to equipment failure, financial reasons and other circumstances beyond our control it was decided to close the 3 continuous monitoring stations (2 in Sawbridgeworth and 1 in Anstey) and open 1 continuous monitoring station in Hertford. The 3 monitoring stations were closed on 2<sup>nd</sup> June 2015. As data capture at all 3 stations was less than 50% it will not be possible to present any results of continuous monitoring for this calendar year.

A new monitoring station has been installed on Gascoyne Way in Hertford. The station includes a

1. Chemiluminescence NO/NO<sub>2</sub>/NO<sub>x</sub> Analyser
2. A PM<sub>10</sub> Monitor (TEOM)
3. A PM<sub>2.5</sub> monitor (BAM)

Data from this station should be available to report on in 2017.

### 3.1.2 Non-Automatic Monitoring Sites

East Herts Council undertook non- automatic (passive) monitoring of NO<sub>2</sub> at 19 sites during 2015 Table A. in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) and bias adjustment for the diffusion tubes are included in Appendix C.

## 3.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for “annualisation” and bias. Further details on adjustments are provided in Appendix C.

### 3.2.1 Nitrogen Dioxide (NO<sub>2</sub>)

In 2015 all 11 locations where Nitrogen Dioxide was measured above the objective are already located in an AQMA. 4 of the 11 locations in the AQMA recorded annual means in excess of 60µg/m<sup>3</sup> which indicates a possible exceedence of the hourly objective. 2 of these locations are located within the Hockerill junction AQMA, 1 in the Hertford AQMA, and the other within the new AQMA in Sawbridgeworth.

As demonstrated in chart 1 below in the first few years within the last 5 there has been a slight increase in the concentrations of Nitrogen Dioxide at most diffusion tube monitoring locations followed by a slow decline. However as can be seen in this chart the changes in annual mean are not significant and it would be hasty to determine the reduction in concentrations as a result of a reduction in traffic emissions and not other environmental factors such as weather. East Herts Council will continue to monitor Nitrogen Dioxide at these locations to determine whether this is the beginning of a longer term improvement in air pollution

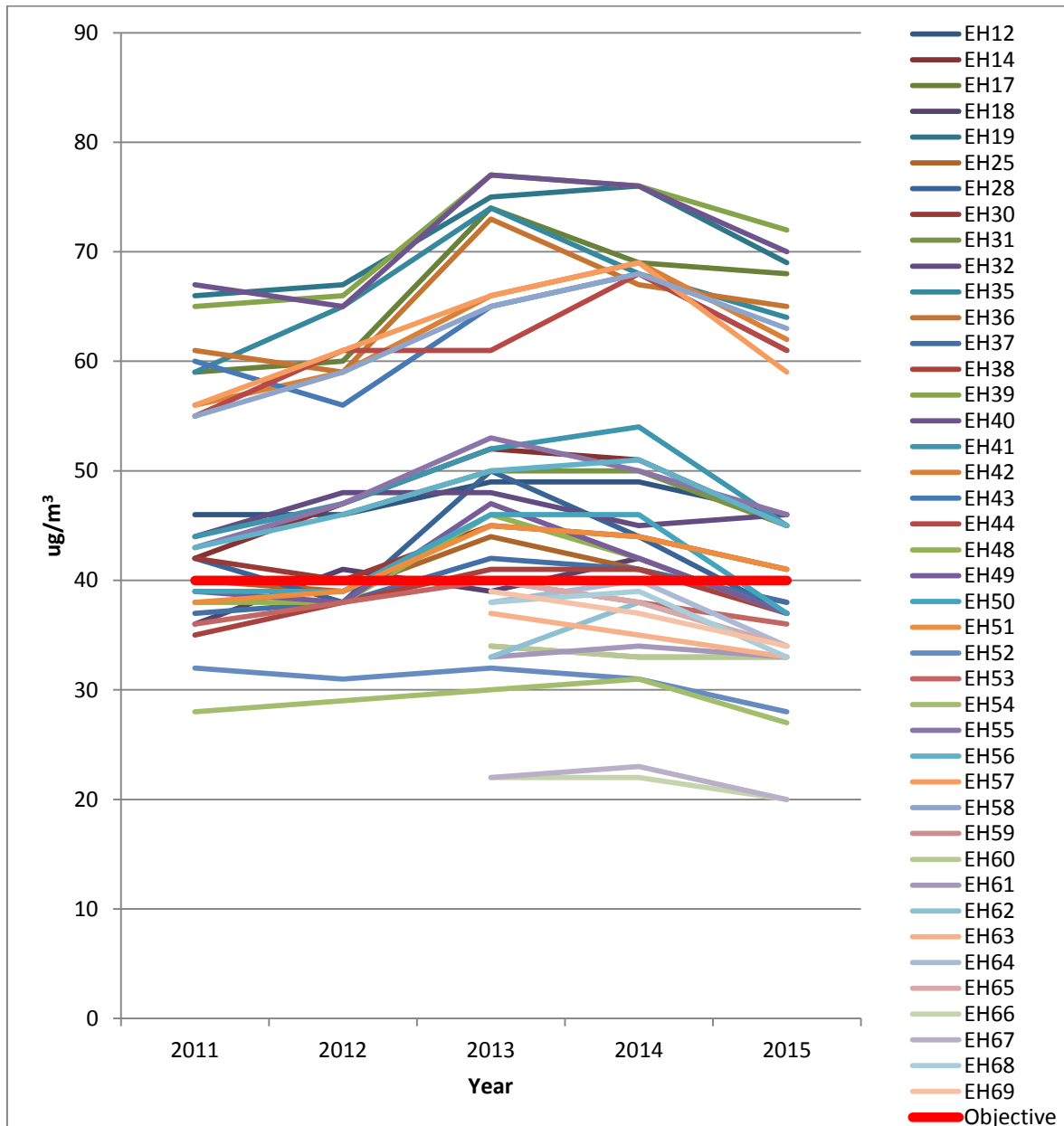


Chart 1

For diffusion tubes, the full dataset of monthly mean values is provided in Appendix B.

### 3.2.2 Particulate Matter (PM<sub>10</sub>)

As mentioned previously the 3 Air Quality monitoring stations were closed on 2<sup>nd</sup> June 2015. As data capture at all 3 stations was less than 50% it will not be possible to present any results of continuous monitoring for this calendar year. This includes the PM<sub>10</sub> data.

### 3.2.3 Particulate Matter (PM<sub>2.5</sub>)

East Herts Council did not monitor PM<sub>2.5</sub> in 2015. However in June 2016 a BAM was installed at a new Air Quality Monitoring station on Gascoyne Way, Hertfordshire. There should be sufficient data to report on in the 2017 ASR.

## Appendix A: Monitoring Results

Table A.1 – Details of Non-Automatic Nitrogen Dioxide Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Height (m)
EH12 EH31 EH32	Hockerill Street, Bishops Stortford	roadside	549156	221242	Y	0.9	1.38		2.5
EH14 EH55 EH56	London Road, Sawbridgeworth	roadside	548065	214711	Y	0.6	2.6		3
EH17 EH35 EH36	Dunmow Road, Bishops Stortford	kerbside	549364	221215	Y	7.4	1.8		2.75
EH18 EH37 EH38	Stansted Road, Bishops Stortford	roadside	549298	221313	Y	2.7	1.43		2.7
EH19 EH39 EH40	London Road Bishops Stortford	roadside	549250	221200	Y	0.4	1.05		2.5
EH25	Old Cross Hertford	kerbside	532449	212675	Y	3.1	0.92		3
EH28 EH48 EH49	Castle St Hertford	roadside	532542	212370	Y	12.5	2.39		2.35
EH30	Downey Cottage Hertingfordbury Rd	roadside	532023	212550	Y	1.8	0.5		2.35



Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	In AQMA?	Distance to Relevant Exposure (m) <sup>(1)</sup>	Distance to kerb of nearest road (m) <sup>(2)</sup>	Tube collocated with a Continuous Analyser?	Height (m)
EH50 EH51									
EH41	Ware Rd Hertford	roadside	533101	212755	Y	2.1	1.08		2.3
EH42 EH43 EH44	West St Hertford	roadside	533101	212755	Y	4.8	2.75		2.75
EH52	Cowbridge Hertford	roadside	532307	212814	N	1.5	3.2		2.65
EH53	Viaduct Road Ware	roadside	536068	214120	N	3.1	1.83		2.9
EH54	Station Road Ware	roadside	536085	214077	N	20.7	1.75		2.6
EH57 EH58	Opposite Bell Street Sawbridgeworth at crossing	roadside	548123	214903	Y	0.6	2.75		2.8
EH59 EH60 EH61	Cutforth Road Sawbridgeworth	Kerbside	548222	215395	Y	1.5	3	Y	2.2
EH62 EH63	Northgate End Bishops Stortford	Roadside	548723	221719	N	6	2.5		2.6
EH64 EH65	79 Rye Street Bishops Stortford	Roadside	548741	222109	N	3.9	1.5		2.25
EH66 EH67	209 Rye Street Bishops Stortford	Roadside	549163	222731	N	0.5	1.2		2.5
EH68 EH69	9 Hadham Road Bishops Stortford	Roadside	548611	221541	N	0.5	1.5		2.35

## Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO<sub>2</sub> Monthly Diffusion Tube Results – 2015

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )													Annual Mean	
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted <sup>(1)</sup>	
	EH12	54	58	51	52	53	46	54	53	44	46	61	61	53	46
EH14	54	57	51	58	45	52	48	49	49	59	46	40	51	45	
EH17	88	86	86	91	70	81	69	70	76	85	65	54	77	68	
EH18	48	52	45	41	33	38	38	41	32	45	42	44	42	37	
EH19	91	92	73	80	68	78	80	77	69	114	62	60	79	69	
EH25	52	53	46		39	41	38	40	38	45	40	39	43	38	
EH28	38	60	45	50	38	37	31	35		48	31	45	42	37	
EH30	51	52	43	48	45	47	40	48	45	49	47	43	47	41	
EH31	56	56	49	51	51	48	58	49	36	43	60	58	51	45	
EH32	56	57	52	54	50	51	53	46	42	44	65	61	53	46	
EH35	79	87	75	88	70	83	70	73	61	86	48	55	73	64	
EH36	86	82	85	80	73	76	74	66	67	86	58	55	74	65	
EH37	52	46	46	40	38	38	39	42	34	46	50	41	43	38	
EH38	53	49	46	42	39	37	40	40	33	42	42	47	43	37	
EH39	96	90	82	86	80	84	80	75	74	94	81	62	82	72	
EH40	95	91	82	79	81	80	82	69	63	87	83	61	79	70	
EH41	59	57			44	44	45	52	46	52	58	52	51	45	

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted <sup>(1)</sup>
EH42	87	85	75	65	66	62	68	68	57	73	70	64	70	62
EH43	76	83	60	72	66	68	68	70	60	72	67	70	69	61
EH44	79	86	74	69	73	65	61	68	56	68	73	58	69	61
EH48	48	53	49	47	34	37	35	37	38	49	40	43	43	37
EH49	49	49	46	54	36	37	34	37	40	46	45	36	42	37
EH50	53	18	43	51	40	47	43	48	44	29	47	47	43	37
EH51	50	51	47	51	41	42	40	47	43	48	56	42	47	41
EH52	37	37	33	29	29	27	27	28	28	28	39	35	31	28
EH53	50	53	43	39	32	33	34	38	34	39	47	43	40	36
EH54	39	39	34	28	26	25	26	27	27	30	29	37	31	27
EH55	60	63	54	58	42	51	46	54	43	58	48	48	52	46
EH56	53	59	53	53	51	50	47	52	47	60	41	49	51	45
EH57	85	81	66	66	68	61	73	66	57	64	50	67	67	59
EH58	82	76	75	70	72	65	78	69	56	69	70	72	71	63
EH59	42	44	37	33	29								37	33
EH60	42	44	38	33	31								38	33
EH61	46	43	37	32	31								38	33
EH62	42	50	43	41	31	32	29	36	35	42	44	44	39	34
EH63	44	44	42	36	32	32	32	33	34	44	39	42	38	33
EH64	52	47	41	38	30	30	33	34	35	44	44	40	39	34
EH65	49	47	41	36	33	35	32	34	35	41	43	44	39	34

Site ID	NO <sub>2</sub> Mean Concentrations (µg/m <sup>3</sup> )													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean	
													Raw Data	Bias Adjusted <sup>(1)</sup>
EH66	24	28	23	23	16	13		22	19	22	26	29	22	20
EH67	27	29	24	20	18	18	18	21	18	23	25	32	23	20
EH68	39	44	39	44	32	35	30	36	32	42	37	38	37	33
EH69	39	45	40	45	34	34	35	38	39	43	35	39	39	34

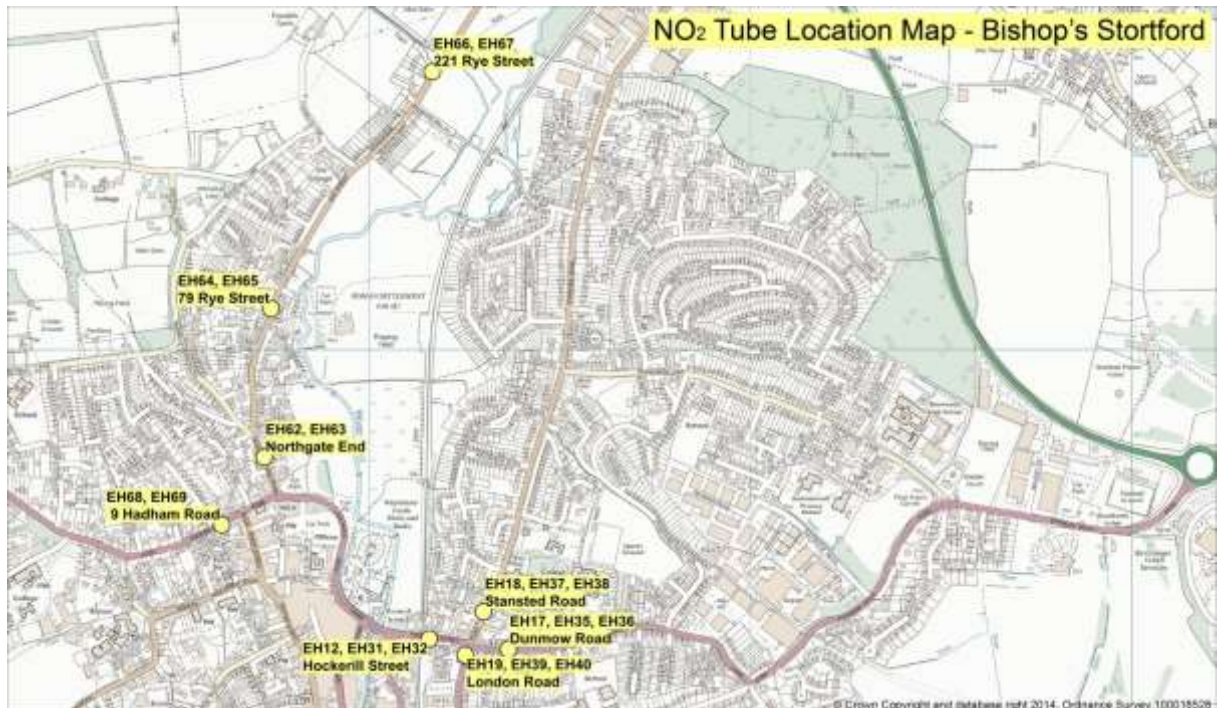
(1) See Appendix C for details on bias adjustment

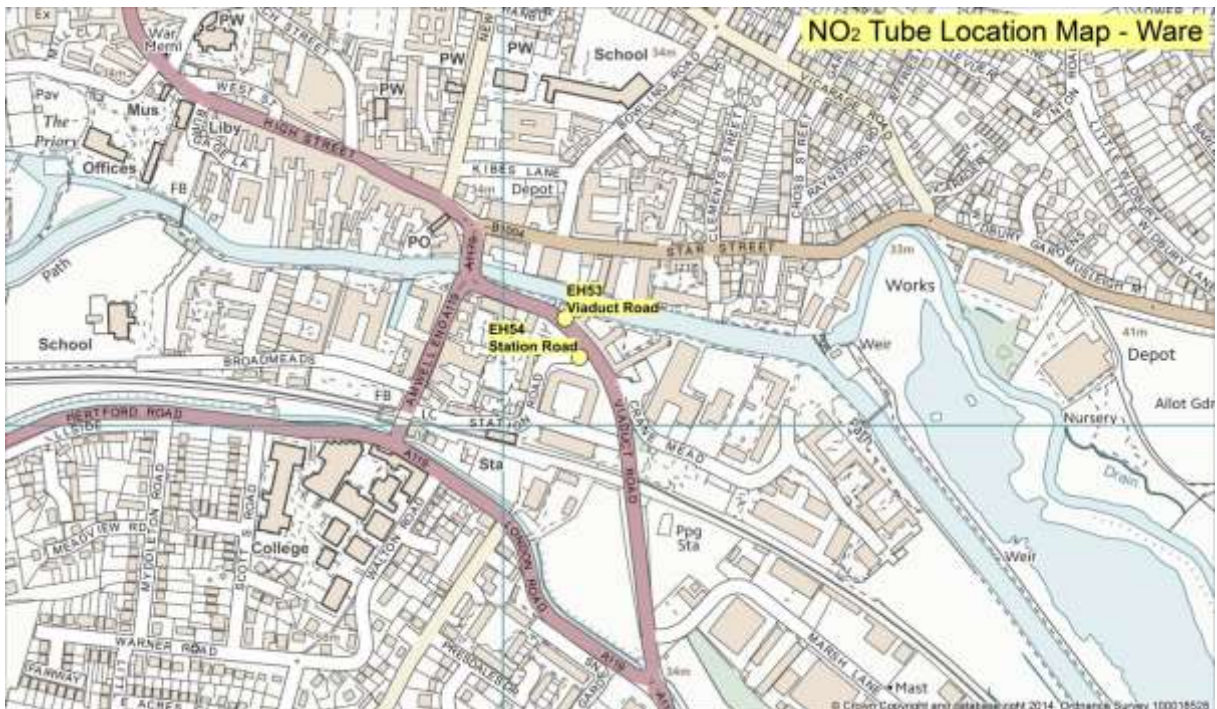
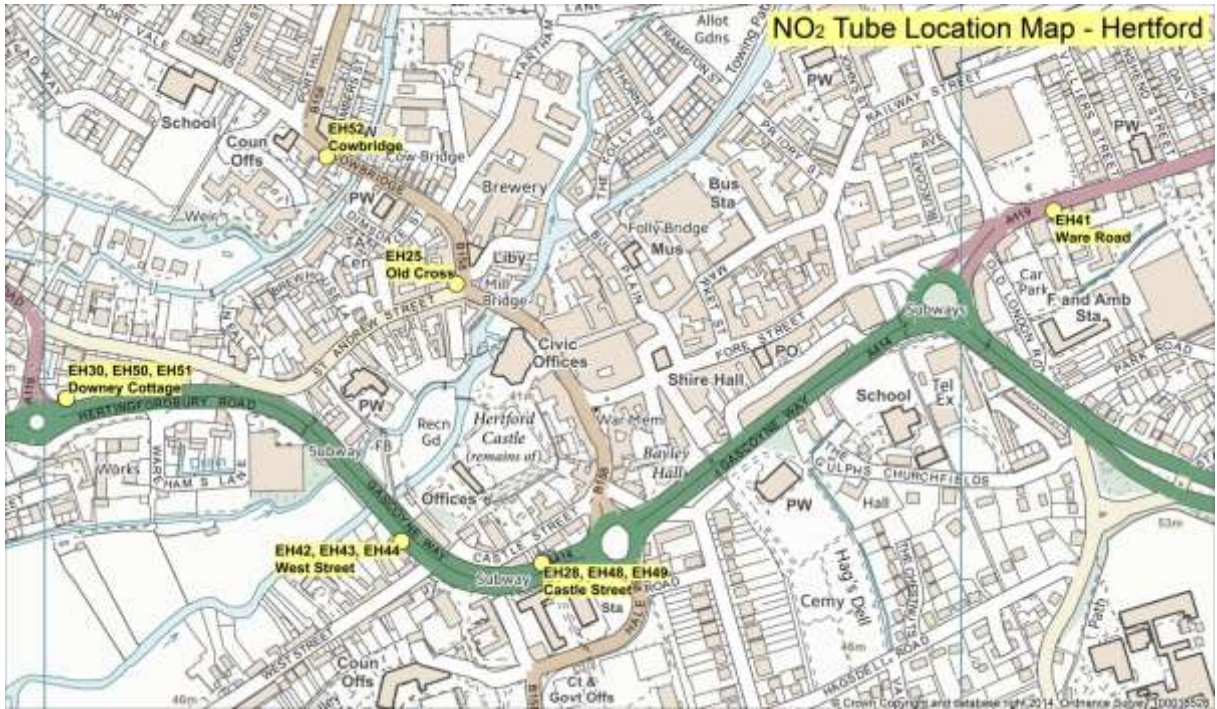
## Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC

In 2015 Gradko scored a 100% in all rounds of the AIR-PT/WASP scheme. Gradko were also determined good in the results of the laboratory precision scheme.

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 <sup>4</sup> 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 is 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 <sup>4</sup> . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953			
Analysed By <sup>1</sup>	Method <sup>2</sup> <small>To undo your selection, choose (All) from the pop-up list</small>	Year <sup>3</sup> <small>To undo your selection, choose (All)</small>	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m <sup>3</sup> )	Automatic Monitor Mean Conc. (Cm) (µg/m <sup>3</sup> )	Bias (B)	Tube Precision <sup>4</sup>	Bias Adjustment Factor (A) (Cm/Dm)	
Gradko	20% TEA in water	2015	R	Ards and North Down Borough Council	12	38	26	48.6%	G	0.67	
Gradko	20% TEA in water	2015	UC	Breckland Council	12	30	29	1.5%	G	0.99	
Gradko	20% TEA in water	2015	R	Cheltenham Borough Council	12	35	35	2.7%	G	0.97	
Gradko	20% TEA in water	2015	R	Lisburn & Castlereagh City Council	10	36	29	24.8%	G	0.80	
Gradko	20% TEA in water	2015	R	Luton Borough Council	12	46	44	6.0%	G	0.94	
Gradko	20% TEA in water	2015	R	Monmouthshire County Council	12	41	37	11.0%	G	0.90	
Gradko	20% TEA in water	2015	B	Pembrokeshire Council	10	4	3	36.7%	G	0.73	
Gradko	20% TEA in water	2015	R	City of Lincoln Council	12	39	33	17.9%	G	0.85	
Gradko	20% TEA in water	2015	R	Borough Council of King's Lynn and West Norfolk	12	29	22	32.5%	G	0.75	
Gradko	20% TEA in water	2015	R	Cheshire West and Chester	10	38	40	-5.2%	G	1.06	
Gradko	20% TEA in water	2015	R	Dudley MBC	12	47	50	-5.9%	G	1.06	
Gradko	20% TEA in water	2015	R	Dudley MBC	12	40	35	14.0%	G	0.88	
Gradko	20% TEA in water	2015	R	Dudley MBC	12	34	31	10.0%	G	0.91	
Gradko	20% TEA in water	2015	UB	Dudley MBC	11	23	19	20.9%	G	0.83	
Gradko	20% TEA in water	2015	KS	Marylebone Road Intercomparison	12	102	81	26.2%	G	0.79	
Gradko	20% TEA in water	2015	UB	Liverpool	12	20	22	-9.0%	G	1.10	
Gradko	20% TEA in water	2015	R	Preston City Council	12	29	27	8.9%	G	0.92	
Gradko	20% TEA in water	2015	R	Thurrock Borough Council	12	28	23	22.5%	G	0.82	
Gradko	20% TEA in water	2015	R	Gateshead Council	11	33	34	-1.2%	G	1.01	
Gradko	20% TEA in water	2015	R	Gateshead Council	12	28	27	3.9%	G	0.96	
Gradko	20% TEA in water	2015	R	Gateshead Council	10	36	32	11.5%	G	0.90	
Gradko	20% TEA in water	2015	KS	New Forest DC	11	47	36	31.1%	P	0.76	
Gradko	20% TEA in water	2015	R	New Forest DC	11	33	25	31.7%	G	0.76	
Gradko	20% TEA in water	2015	UC	Southampton City Council	12	28	29	-3.5%	G	1.04	
Gradko	20% TEA in water	2015	R	Wokingham Borough Council	11	36	33	7.9%	G	0.93	
Gradko	20% TEA in water	2015	R	Brighton & Hove City Council	9	47	38	24.1%	G	0.81	
Gradko	20% TEA in water	2015	R	NOTTINGHAM CITY COUNCIL	12	40	39	4.3%	G	0.96	
Gradko	20% TEA in water	2015		<b>Overall Factor<sup>4</sup> (27 studies)</b>					<b>Use</b>	<b>0.88</b>	

## Appendix D: Map(s) of Monitoring Locations





## Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective <sup>4</sup>	
	Concentration	Measured as
Nitrogen Dioxide (NO <sub>2</sub> )	200 µg/m <sup>3</sup> not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Particulate Matter (PM <sub>10</sub> )	50 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m <sup>3</sup>	Annual mean
Sulphur Dioxide (SO <sub>2</sub> )	350 µg/m <sup>3</sup> , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m <sup>3</sup> , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m <sup>3</sup> , not to be exceeded more than 35 times a year	15-minute mean

<sup>4</sup> The units are in microgrammes of pollutant per cubic metre of air (µg/m<sup>3</sup>).



## Glossary of Terms

Abbreviation	Description
AQAP	Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values'
AQMA	Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives
ASR	Air quality Annual Status Report
BAM	Beta Attenuation Monitor
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
LAQM	Local Air Quality Management
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Nitrogen Oxides
PM <sub>10</sub>	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
PM <sub>2.5</sub>	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO <sub>2</sub>	Sulphur Dioxide
TEOM...	Tapered Element Oscillating Microbalance

## References

1. Part IV of Environment Act 1995: Local Air Quality Management. Technical Guidance LAQM.TG (16). Defra,
2. The Air Quality (England) Regulations 2000 (Statutory Instrument 2000 No. 928), March 2000.
3. The Air Quality Strategy for England, Scotland, Wales and Northern Ireland. January 2000. ISBN 0-10-145482-1
4. The Air Quality Amendment Regulations 2002, ISBN 0 11061468 2.