



2015 Updating and Screening Assessment for East Herts

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

July 2015

Local Authority Officer	Cerys Williams
Department	Community Safety and Health Services
Address	Wallfields, Pegs Lane, Hertford, Hertfordshire, SG13 8EQ
Telephone	01279 655261
e-mail	environmental.health@eastherts.gov.uk
Report Reference number	EH15
Date	July 2015

Executive Summary

The Environment Act 1995 requires Local Authorities to periodically review and assess local air quality against the air quality objectives contained in the Air Quality Regulations. Local Authorities are currently undertaking the fifth round of the review and assessment. The fifth round is undertaken in two stages. Initially an Updating and Screening Assessment (USA) which is used to evaluate the Local Authorities area and to establish if any areas are likely to exceed the air quality objectives. The Second stage is to conduct, if necessary, a Detailed Assessment of the areas highlighted in the USA. Following on from this a Local Authority is required to undertake a Further Assessment. Annual Progress Reports are required for all authorities between subsequent rounds of reviews and assessments to update on changes within the district. The Progress Report allows those authorities that have declared Air Quality Management Areas to update on actions detailed in the Action Plan.

This document forms the Updating and Screening Assessment. In writing this report the Council has had regard to the Department for Environment Food and Rural Affairs (Defra) publication 'Local Air Quality Management Technical Guidance: LAQM TG(09)'.

The report provides the latest monitoring results from the air quality monitoring station located at Cutforth Road, Sawbridgeworth, Eden's Mount, Sawbridgeworth, Anstey School and the council's network of Nitrogen Dioxide diffusion tubes.

The results from the continuous air quality monitoring stations show that the air quality objectives that Local Authorities are required to meet were achieved in 2014. The diffusion tube data shows that the air quality objectives are unlikely to be met at 11 locations in the district, all of which are within an AQMA. Consequently a detailed assessment is not required.

Table of contents

1	Introduction	7
1.1	Description of Local Authority Area	7
1.2	Purpose of Report.....	7
1.3	Air Quality Objectives	8
1.4	Summary of Previous Review and Assessments	9
2	New Monitoring Data	17
2.1	Summary of Monitoring Undertaken	17
2.1.1	Automatic Monitoring Sites	17
2.1.2	Non-Automatic Monitoring Sites	21
2.2	Comparison of Monitoring Results with Air Quality Objectives	31
2.2.1	Nitrogen Dioxide	31
2.2.2	PM ₁₀	41
2.2.3	Sulphur Dioxide.....	45
2.2.4	Benzene.....	45
2.2.5	Other pollutants monitored	45
2.2.6	Summary of Compliance with AQS Objectives	47
3	Road Traffic Sources	48
3.1	Narrow Congested Streets with Residential Properties Close to the Kerb	48
3.2	Busy Streets Where People May Spend 1-hour or More Close to Traffic.....	48
3.3	Roads with a High Flow of Buses and/or HGVs.	48
3.4	Junctions.....	49
3.5	New Roads Constructed or Proposed Since the Last Round of Review and Assessment.....	49
3.6	Roads with Significantly Changed Traffic Flows.....	49
3.7	Bus and Coach Stations	50
4	Other Transport Sources.....	51
4.1	Airports.....	51
4.2	Railways (Diesel and Steam Trains)	51
4.2.1	Stationary Trains.....	51
4.2.2	Moving Trains	51
4.3	Ports (Shipping)	52
5	Industrial Sources.....	53
5.1	Industrial Installations	53
5.1.1	New or Proposed Installations for which an Air Quality Assessment has been Carried Out.....	53
5.1.2	Existing Installations where Emissions have Increased Substantially or New Relevant Exposure has been introduced	53
5.1.3New or Significantly Changed Installations with No Previous Air Quality Assessment	53

5.2	Major Fuel (Petrol) Storage Depots	54
5.3	Petrol Stations.....	54
5.4	Poultry Farms.....	54
6	Commercial and Domestic Sources	55
6.1	Biomass Combustion – Individual Installations	55
6.2	Biomass Combustion – Combined Impacts.....	55
6.3	Domestic Solid-Fuel Burning	55
7	Fugitive or Uncontrolled Sources.....	56
8	Conclusions and Proposed Actions.....	57
8.1	Conclusions from New Monitoring Data	57
8.2	Conclusions from Assessment of Sources	57
8.3	Proposed Actions.....	57
9	References.....	58

List of Tables

Table 1.1	Air Quality Objectives included in Regulations for the purpose of LAQM in England	8
Table 2.1	Details of Automatic Monitoring Sites	20
Table 2.2	Details of Non-Automatic Monitoring Sites	24
Table 2.3	Results of Automatic Monitoring of Nitrogen Dioxide: Comparison with Annual Mean Objective	32
Table 2.4	Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective	34
Table 2.5	Results of Nitrogen Dioxide Diffusion Tubes in 2014	36
Table 2.6	Results of Nitrogen Dioxide Diffusion Tubes (2010 to 2014)	39
Table 2.7	Results of Automatic Monitoring of PM ₁₀ : Comparison with Annual Mean Objective	42
Table 2.8	Results of Automatic Monitoring for PM ₁₀ : Comparison with 24-hour mean Objective	43

List of Figures

Figure 1.1 Maps of AQMA Boundaries	14
Figure 2.1 Map of Automatic Monitoring Sites	18
Figure 2.2 Maps of Non-Automatic Monitoring Sites	22
Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations measures at Automatic Monitoring Sites	33
Figure 2.5 Trends in Annual Mean PM ₁₀ Concentrations	44

Appendices

Appendix A: QA/QC Data	59
Appendix B: Graphs from Automatic Monitoring Stations	63
Appendix C: Hertfordshire County Council Traffic Data	65

1 Introduction

1.1 Description of Local Authority Area

East Herts covers 475 square kilometres, with a population of approximately 125,000. It is characterised by attractive rolling countryside. The small towns and villages stand in an area of great natural beauty, with winding country lanes and shallow valleys through which flow the many rivers and streams that cross the district.

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 in a predominantly rural setting. Although the district's rural 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.

Businesses in East Herts tend to be small or micro enterprises concentrating on the provision of services. However, there is a significant manufacturing base in the District, with an equally significant number of warehousing, distribution and real estate businesses; these are often located in small industrial estates.

The recent growth of Stansted Airport has also led to the creation of many new opportunities. This includes airport related service industries such as food preparation.

To date the main source of air pollution in East Herts is from road traffic.

1.2 Purpose of Report

This report fulfils the requirements of the Local Air Quality Management process as set out in Part IV of the Environment Act (1995), the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 and the relevant Policy and Technical Guidance documents. The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where exceedences are

considered likely, the local authority must then declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

The objective of this Updating and Screening Assessment is to identify any matters that have changed which may lead to risk of an air quality objective being exceeded. A checklist approach and screening tools are used to identify significant new sources or changes and whether there is a need for a Detailed Assessment. The USA report should provide an update of any outstanding information requested previously in Review and Assessment reports.

1.3 Air Quality Objectives

The air quality objectives applicable to LAQM in England are set out in the Air Quality (England) Regulations 2000 (SI 928), The Air Quality (England) (Amendment) Regulations 2002 (SI 3043), and are shown in Table 1.1. This table shows the objectives in units of microgrammes per cubic metre $\mu\text{g}/\text{m}^3$ (milligrammes per cubic metre, mg/m^3 for carbon monoxide) with the number of exceedences in each year that are permitted (where applicable).

Table 1.1 Air Quality Objectives included in Regulations for the purpose of LAQM in England

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Benzene	16.25 $\mu\text{g}/\text{m}^3$	Running annual mean	31.12.2003
	5.00 $\mu\text{g}/\text{m}^3$	Running 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	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

Pollutant	Air Quality Objective		Date to be achieved by
	Concentration	Measured as	
Particles (PM ₁₀) (gravimetric)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 µg/m ³	Annual mean	31.12.2004
Sulphur dioxide	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 µg/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

The Council completed the first round of the review and assessment process and declared an Air Quality Management Area (AQMA) for Nitrogen Dioxide (NO₂) and (PM₁₀). This included a number of residential properties adjacent to the A1184 Cambridge Road in Sawbridgeworth from the junction with Crest North to the junction with Station Road/West Street on both sides of the road, and from the same junction north to 98 Cambridge Road on the east side of the road only.

The air quality monitoring site known as East Herts Roadside (located at Cutforth Road) was installed in 2001 to monitor PM₁₀ and NO₂ levels in this area. As a result of this monitoring the Air Quality Management Area was revoked in September 2004.

Two temporary monitoring sites were installed during 2004 as a result of the findings and recommendations detailed in the Updating Screening Assessment - Netcen (2003), both of these continuously monitored for NO₂. The first, on Viaduct Road in Ware, was closed at the end of the year as results showed that the objective levels would be achieved in this location. The second, on London Road in Bishop's Stortford continued to operate for approximately 11 months.

In August 2005 East Herts District Council submitted an Air Quality Progress Report to Defra. This report included the monitoring undertaken from the temporary continuous monitors in addition to the information submitted in the detailed investigation mentioned above (January 2005). The aim of this investigation was to establish the levels of Nitrogen Dioxide in Viaduct Road, Ware and London Road, Bishop's Stortford to identify if there was a legal requirement to declare Air Quality Management Areas in Ware (Viaduct Road) and Bishop Stortford (Hockerill Street/London Road junction). As a result of this report East Herts Council has declared an AQMA in Bishops Stortford.

In April 2006 East Herts District Council reviewed the air quality across the district to establish if there were any areas previously unidentified that would need further investigation. This report considers the conclusions drawn in previous reporting; any new source of pollution since the last round of Review and Assessment and establishes the risk of exceedences of the Air Quality Objectives in areas of public exposure. The report concluded there was no need for any further detailed assessments.

The further assessment submitted in April 2008 confirmed that East Herts District Council was right in declaring the crossroads known as Hockerill junction in Bishop Stortford as an AQMA. A source apportionment study concluded that HGVs were mainly responsible for the exceedence in NO₂ at the junction. Proposals to reduce the number of HGVs and other vehicles at the junction are outlined in Hertfordshire County Council's County & District Air Quality Action Plan.

In April 2008, East Herts District Council submitted a Progress Report; the report concluded that the Air Quality Management Area should remain at the Hockerill Junction. The diffusion tube at West Street, Hertford exceeded the objective level. It was therefore recommended that diffusion tubes should be collocated in triplicate at this location. The information gathered should then be reviewed and reported in the Updating Screening Assessment in April 2009, and if necessary proceed to a detailed assessment of the area in 2011.

The 2009 Updating and Screening Assessment required detailed assessments to be carried out at Gascoyne Way, Hertford and Viaduct Road Ware. These assessments concluded that an AQMA needed to be declared at Gascoyne Way (see figure 1.1). However it was noted that the sole diffusion tube on Viaduct Road was located next to a heating vent and therefore the results and conclusions were unreliable. East Herts Council decide to undertake further monitoring at alternative locations to ascertain whether or not the vent was artificially elevating the results at this monitoring point.

The 2010 progress report concluded that a detailed assessment was required in the area of Ware Road and Old Cross, Hertford. It was decided to carry out this work as part of the further assessment on the already declared AQMA at Gascoyne Way. It was also considered necessary to install additional diffusion tubes in the vicinity of EH14 – London Road, Sawbridgeworth. Further monitoring is required to try to determine why there is such a discrepancy between the diffusion tube data and the roadside continuous monitoring in the area.

The 2010 results from the continuous air quality monitoring stations showed that the air quality objectives were achieved. Diffusion tube data for this year showed that the air quality objectives were unlikely to be met at 10 locations (27 tubes) in the district, most of which were already subject to detailed assessment or were located within an Air Quality Management Area (AQMA). As a result of the 2011 progress report a detailed assessment was undertaken on London Road, Sawbridgeworth.

In April 2011 East Herts Council commissioned a consultancy known as AQC to carry out a Further Assessment on the Gascoyne Way, Hertford AQMA. This assessment considered the need to expand the AQMA to include the following diffusion tubes located at Old Cross, Hertford and Ware Road, Hertford which failed the annual objective in 2009.

The 2011 annual mean concentrations for nitrogen dioxide and PM₁₀ at both continuous monitoring sites were below the 40 µg/m³ objective. The hourly mean objectives for both pollutants were also met. The annual mean objective of 40µg/m³ was exceeded at 11 nitrogen dioxide diffusion tube locations, 6 of these are already

in an AQMA and 2 are in a proposed extension. A distance from road calculation concluded that the concentration of NO₂ at the nearest relevant receptor at 2 locations was below the 40 µg/m³ threshold. A detailed assessment was undertaken in respect of London Road, Sawbridgeworth, but not to the same extent as concluded in the Progress Report 2011.

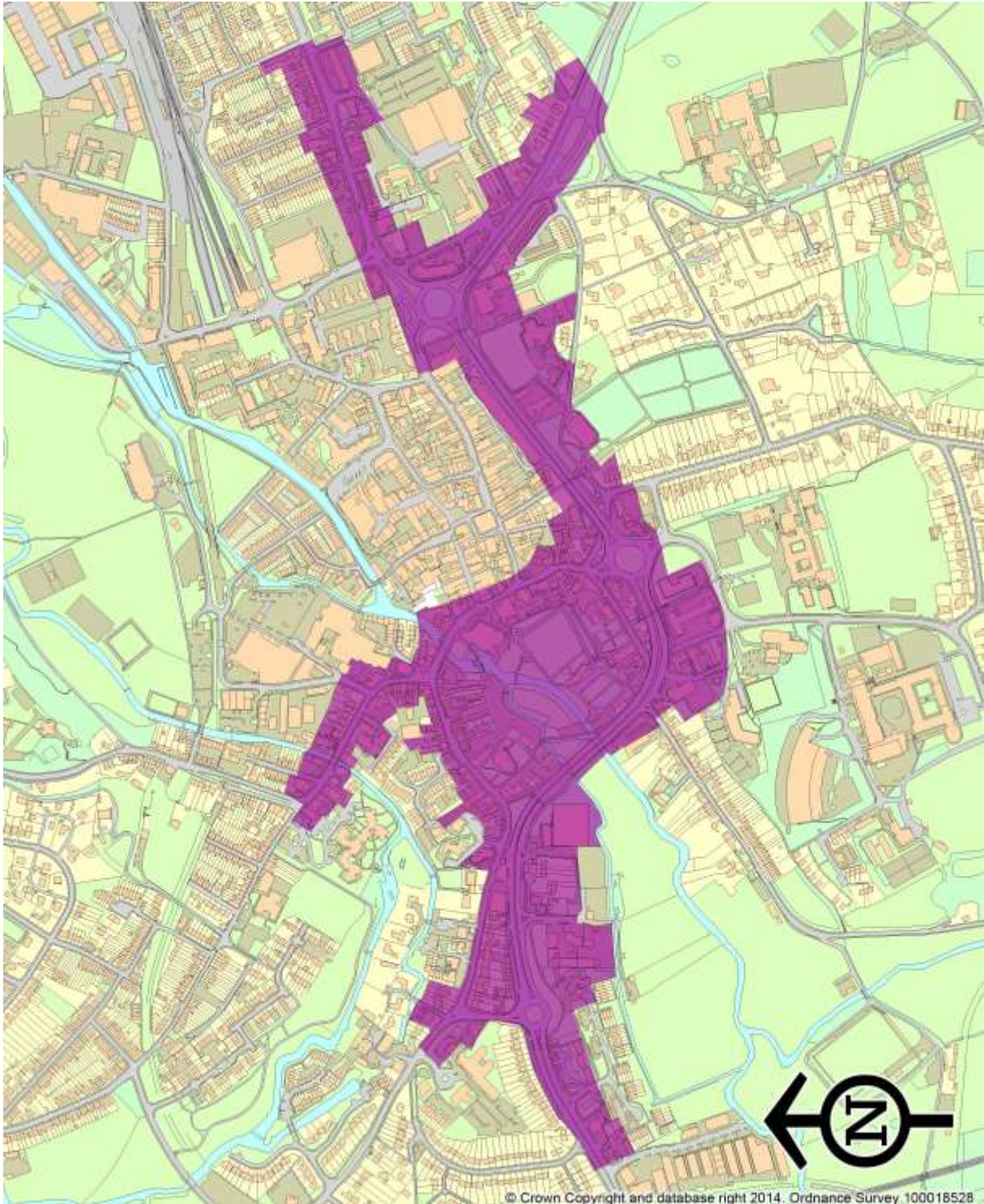
A Detailed Assessment was undertaken for Sawbridgeworth to determine the extent of the area affected by nitrogen dioxide in excess of the objective level. This identified parts of London road, Cambridge road, West road and Station Road as being exposed to elevated levels of nitrogen dioxide. The assessment identified this area as having an annual mean nitrogen dioxide as in excess of 36µg/m³. This level was considered appropriate as a precautionary measure. The Council then proceeded to consultation prior to the formal declaration of an Air Quality Management Area here.

The results from the 2013 Progress Report show that the background continuous air quality monitoring station met the required objectives for both nitrogen dioxide and PM₁₀. Whilst meeting the PM10 objective, the Roadside monitoring station failed the annual objective for Nitrogen Dioxide. Nitrogen dioxide diffusion tubes at 8 of the 16 locations exceeded the annual mean objective of 40µg/m³. Most of these have already been subject to detailed assessment or are located within an Air Quality Management Area (AQMA). The remaining diffusion tubes are located at London Road, Sawbridgeworth where AQC have undertaken a detailed assessment on behalf of East Herts Council. A further location at Viaduct road in Ware recorded an annual mean of 40µg/m³. It was considered to be appropriate to keep a watching brief on this location as it has tended to fluctuate just below the objective level and many other tubes measured an increase in concentrations in 2013. As this tube recorded 40µg/m³ at 1.83m from the road, the nearest receptor at 3.1m from the road would not be exposed to nitrogen dioxide levels above the objective level.

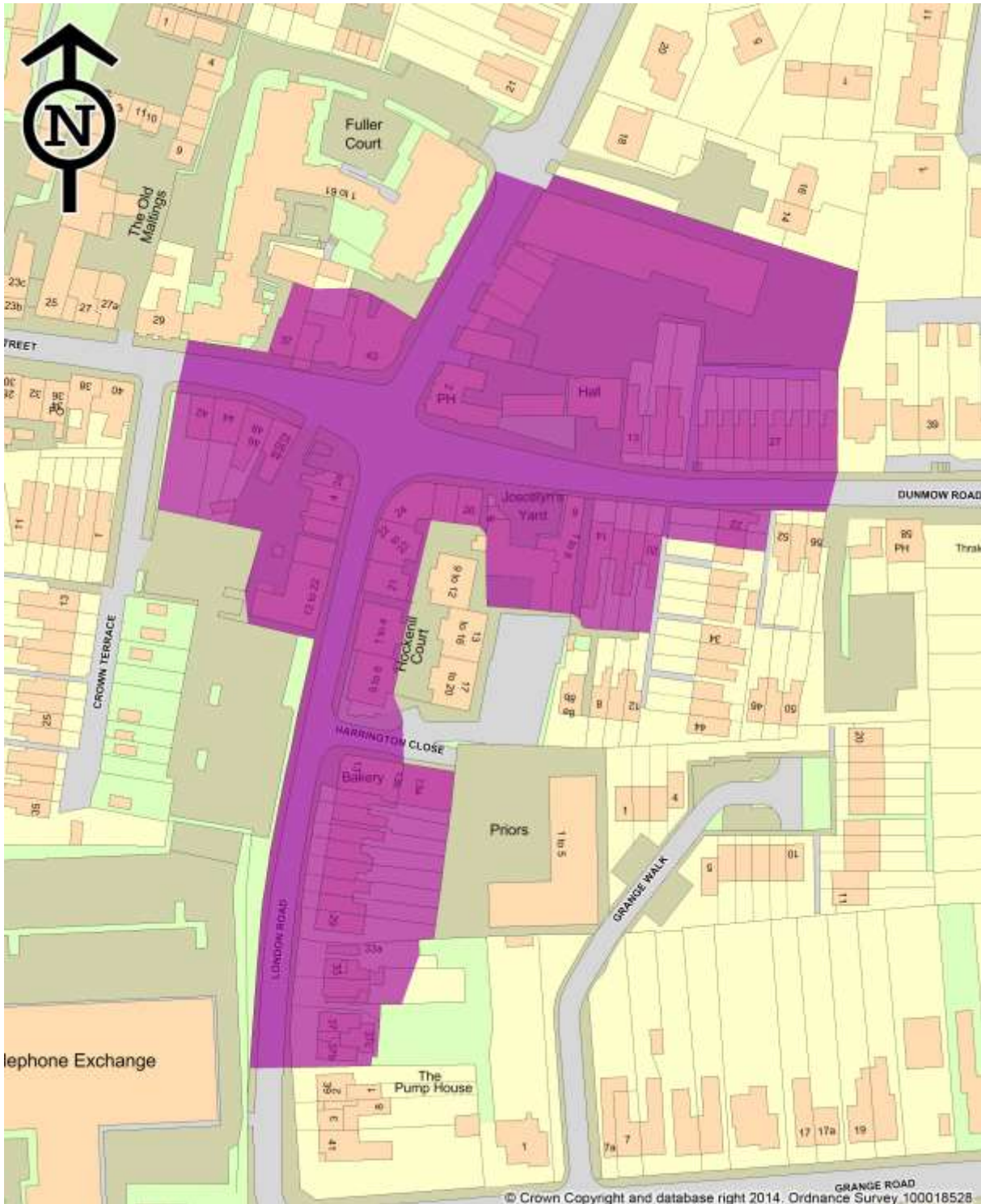
The results from the continuous air quality monitoring stations show that the air quality objectives that Local Authorities are required to meet were achieved at both the Background and Roadside monitors. East Herts Council has a network of 42 diffusion tubes, located at 19 different sites. Diffusion tubes at 11 of these sites

recorded an annual mean above the objective of $40\mu\text{g}/\text{m}^3$. These have either already been subject to detailed assessment and are awaiting the declaration of an Air Quality Management Area (AQMA), or are located within an existing AQMA. The diffusion tube located on Viaduct Road Ware recorded nitrogen dioxide equal to the Annual Mean Objective.

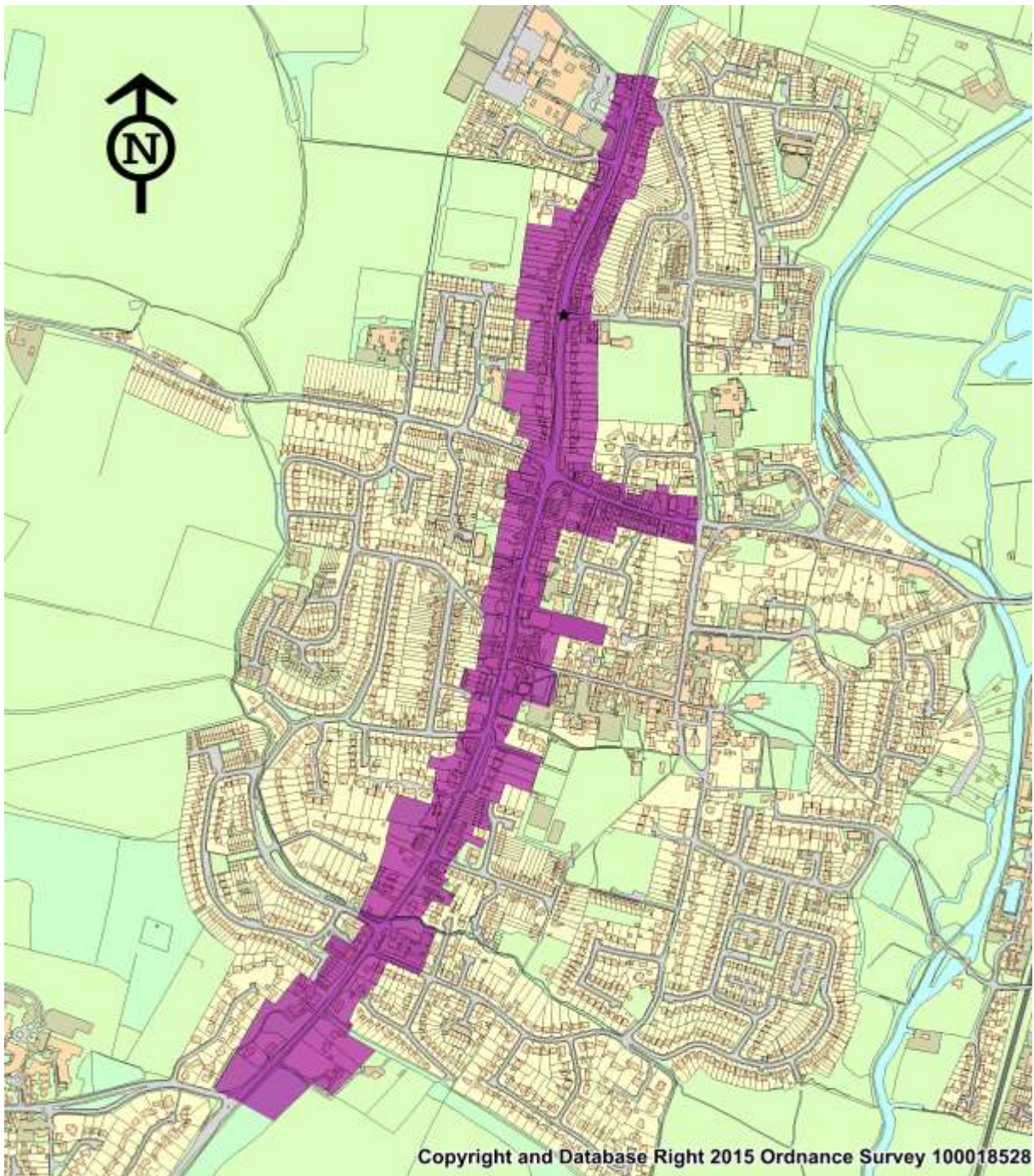
Figure 1.1 Maps of AQMA Boundaries



Hertford AQMA, Gascoyne Way



Bishop's Stortford AQMA, Hockerill Junction



Sawbridgeworth AQMA, Cambridge Road extending through London Road to Bonks Hill

2 New Monitoring Data

2.1 Summary of Monitoring Undertaken

2.1.1 Automatic Monitoring Sites

East Herts Council has three air quality monitoring sites in its district as detailed in table 2.1 below.

Quality Assurance / Quality Control of Automatic Monitoring sites

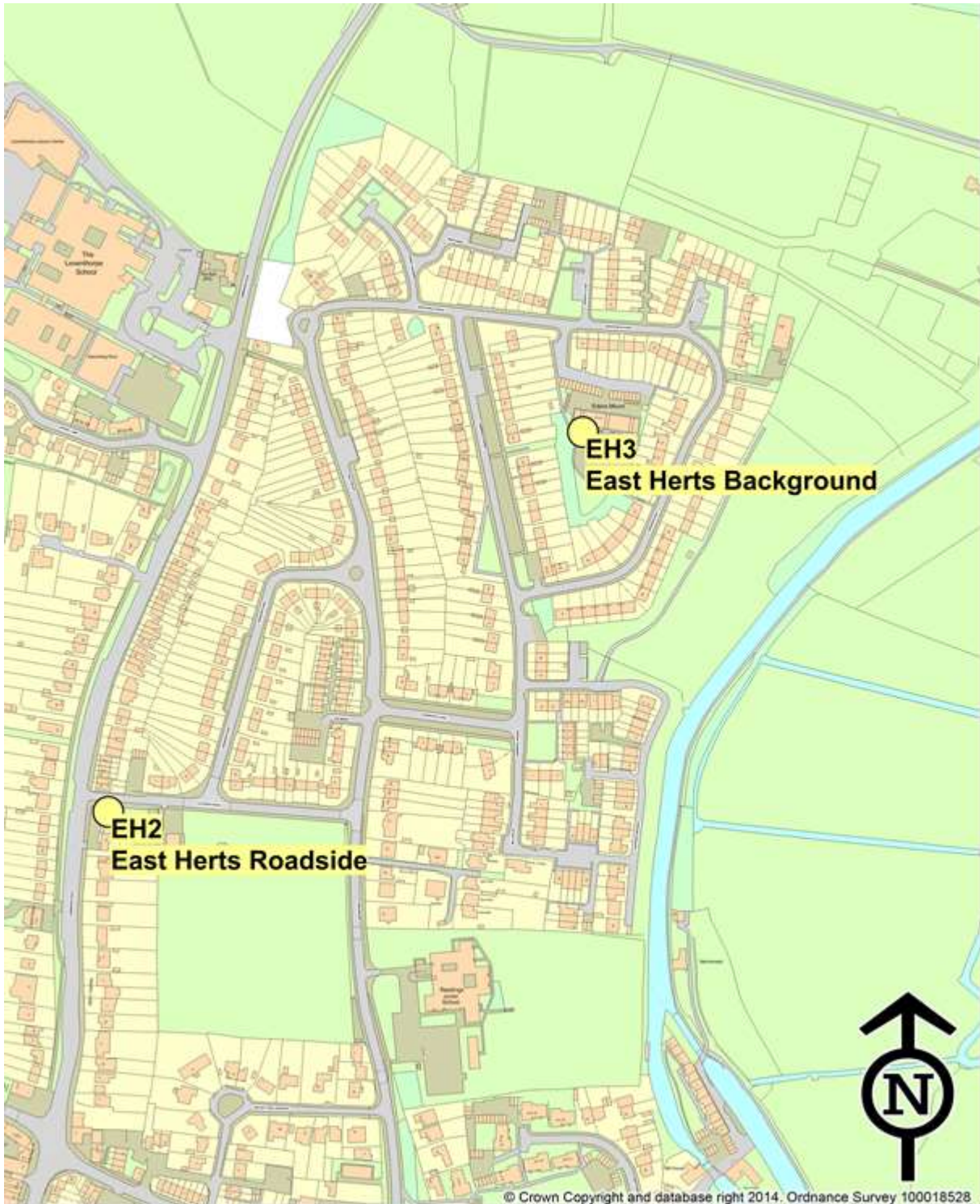
The sites are calibrated by the Local Authority (Local Site Operator) on a fortnightly basis. The analysers were covered by a service and maintenance contract with SupportingU. However SupportingU went into liquidation on November 26th 2014 and since this date the analysers have not been covered by a service and maintenance contract.

The data from the Air Quality Management Stations was ratified by a company known as AQDM according to the Automatic Urban Rural Network (AURN) standard. The data undergoes 'daily sensibility' checks 365 days per year. It is then further ratified on a monthly basis, taking Local Site Operator and Engineer visits into account. It is reviewed again as an annual dataset at the end of the year. The data is then compared to data collected from other local network monitoring sites. Further information on the QA/QC of automatic monitoring can found in Appendix A3

Correction of TEOM data

East Herts Council monitors PM₁₀ at 2 locations using a TEOM monitor. The volatile correction model (VCM) has been used to correct the data. The model allows the correction of TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by this instrument. The resulting corrected measurements have been demonstrated as equal to the gravimetric reference equivalent. AQDM has applied the correction model to all PM₁₀ data listed in this document (see appendix A2).

Figure 2.1 Map of Automatic Monitoring Sites



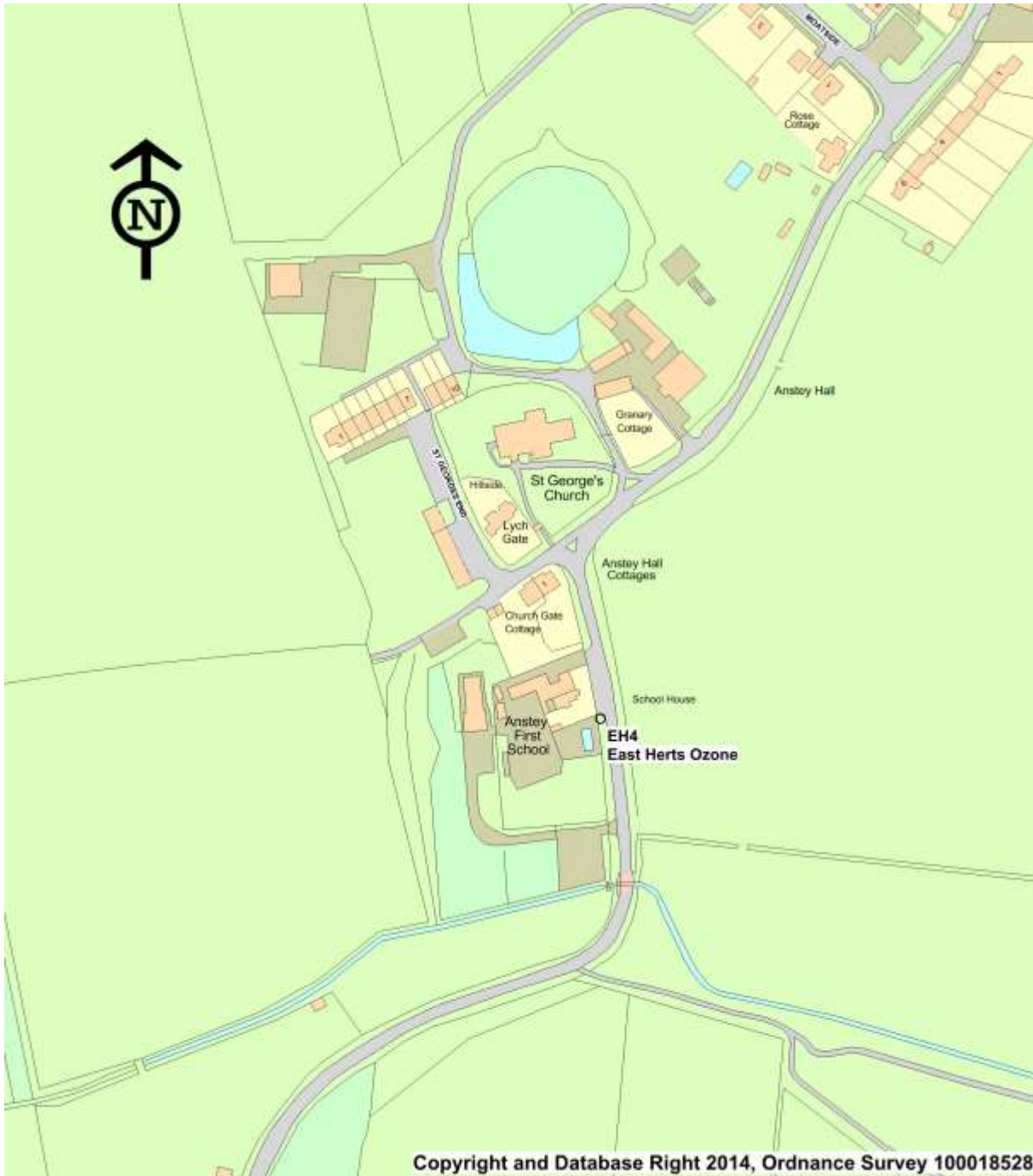


Table 2.1 Details of Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	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?
EH2 : East Herts Roadside	Roadside	548222	215395	NO ₂ PM ₁₀	Y	Chemiluminescence Analysers TEOM	N	2m	N
EH3 : East Herts Background	Urban Background	548550	215646	NO ₂ PM ₁₀	N	Chemiluminescence Analysers TEOM	N	N/A	N
EH4 ; Anstey	Rural	540449	232777	O ₃	N	Chemiluminescence Analyser	N	N/A	N

2.1.2 Non-Automatic Monitoring Sites

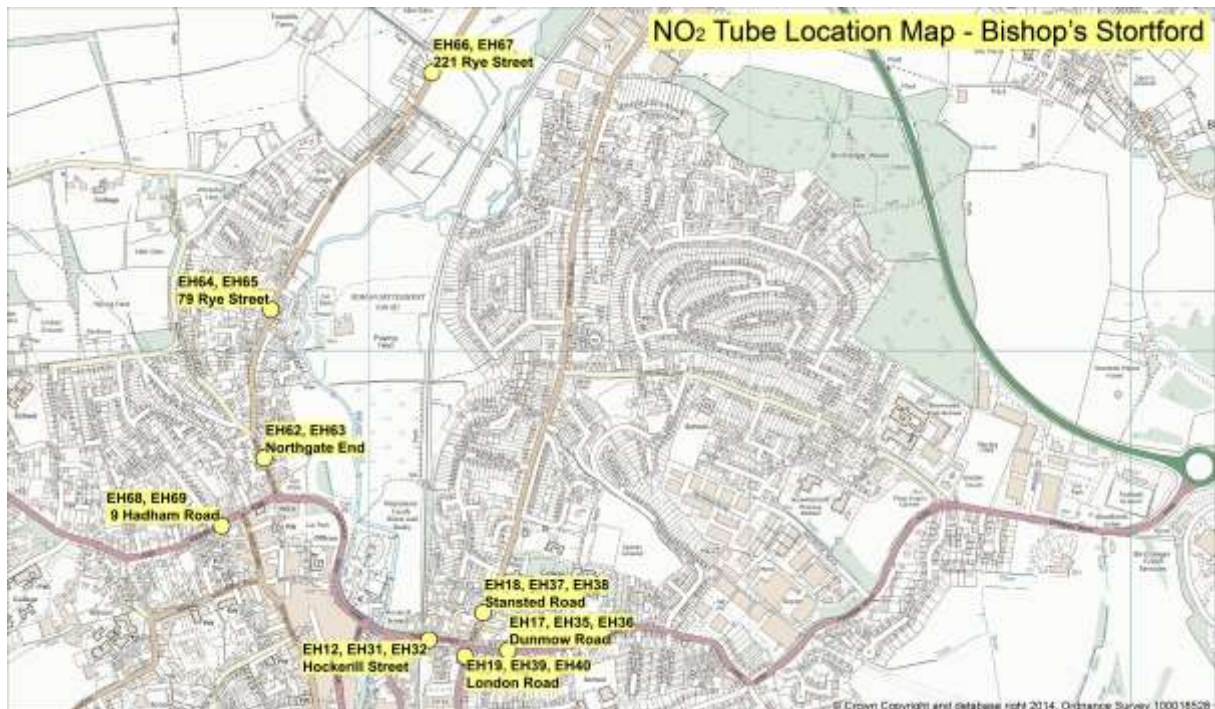
East Herts Council currently has a network of 42 diffusion tubes, a number of which are collocated in duplicate or triplicate as mentioned in Table 2.2. In April 2009 East Herts changed their diffusion tube supplier from Lambeth Scientific Services (using the 50% TEA in acetone method) to Gradko, using the 20% TEA in Water to improve on the precision of the results.

In 2014 Gradko scored a 100% in the all three rounds of the WASP scheme. Gradko were also determined good in the results of the laboratory precision scheme.

Collocation Study and Bias Adjustment

East Herts undertook a collocation study, in accordance with the reference method at the roadside continuous monitoring site located at Cutforth road, Sawbridgeworth. However there had been some problems with the service and maintenance of the monitoring equipment at Cutforth Road it was decided to take the precautionary approach and use the National Bias Adjustment factor. The National Bias Adjustment Factor was calculated as 0.91 (see Appendix A1).

Figure 2.2 Maps of Non-Automatic Monitoring Sites



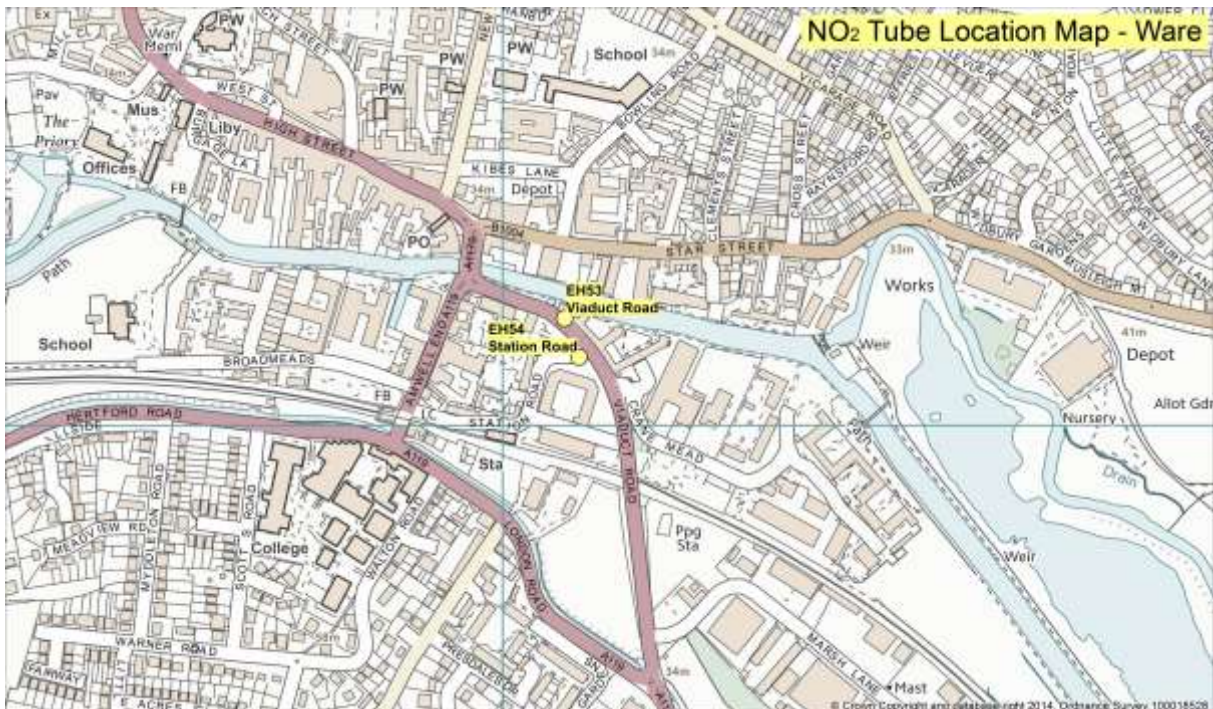
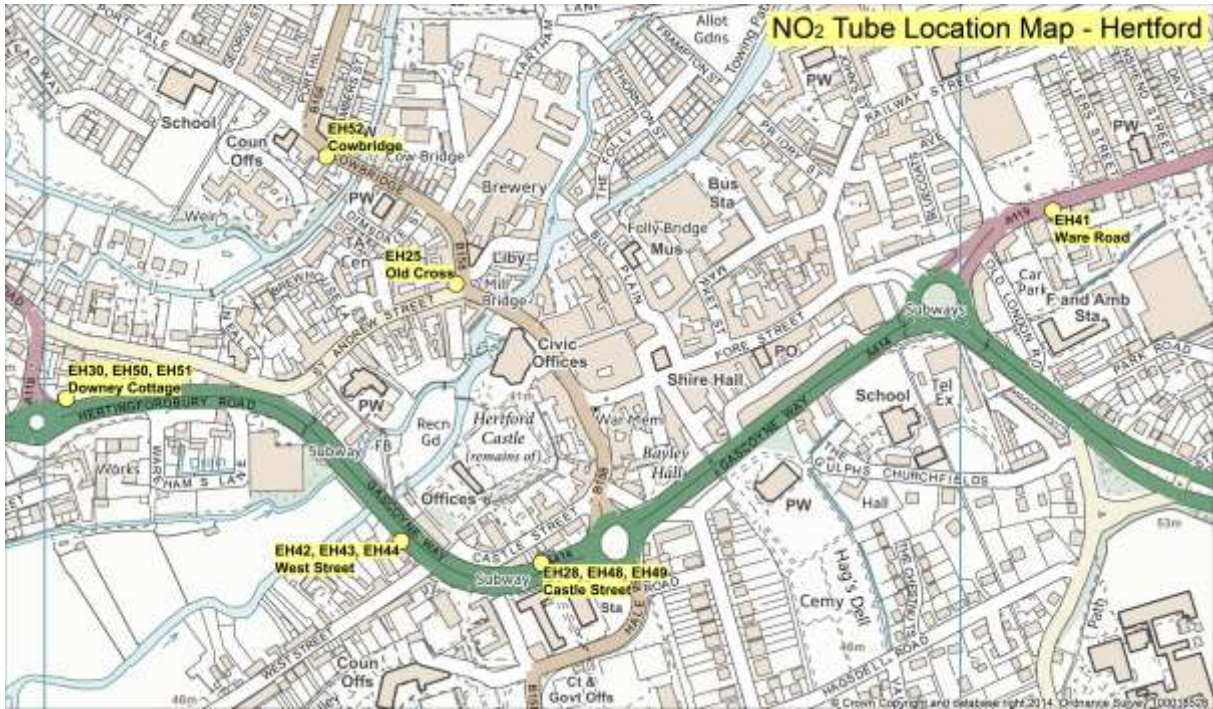


Table 2.2 Details of Non-Automatic Monitoring Sites

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
EH12 : Hockerill Street, Bishop's Stortford	Roadside	549156	221242	NO ₂	Y	N	Y (0.9)	1.38	Y
EH31 : Hockerill Street, Co-located with EH12	Roadside	549156	221242	NO ₂	N	N	Y (0.9)	1.38	Y
EH32 : Hockerill Street, Co-located with EH12	Roadside	549156	221242	NO ₂	N	N	Y (0.9)	1.38	Y
EH14 : London Road, Sawbridgeworth	Roadside	548065	214711	NO ₂	N*	N	Y (0.6)	2.6	Y
EH55 ; London Road Sawbridgeworth co-located with EH14	Roadside	548065	214711	NO ₂	N*	N	Y (0.6)	2.6	Y
EH56 ; London Road Sawbridgeworth co-located with EH14	Roadside	548065	214711	NO ₂	N*	N	Y (0.6)	2.6	Y

East Herts Council

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
EH17 : Dunmow Road, Bishop's Stortford	Roadside	549364	221215	NO ₂	N	N	Y (7.4)	1.8	Y
EH35 ; Dunmow Road, Bishops Stortford Co- located with EH17	Roadside	549100	221215	NO ₂	N	N	Y (7.4)	1.8	Y
EH36 ; Dunmow Road, Bishops Stortford Co- located with EH17	Roadside	549364	221215	NO ₂	N	N	Y (7.4)	1.8	Y
EH18: Stansted Road, Bishop's Stortford	Roadside	549298	221313	NO ₂	N	N	Y (2.7)	1.43	Y
EH37 ; Stansted Road, Co-located with EH18	Roadside	549298	221313	NO ₂	N	N	Y (2.7)	1.43	Y
EH38 : Stansted Road, Co-located with EH18	Roadside	549298	221313	NO ₂	N	N	Y (2.7)	1.43	Y
EH19: London Road, Bishop's Stortford	Roadside	549250	221200	NO ₂	Y	N	Y (0.4)	1.05	Y

East Herts Council

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
EH39 : London Road Co-located with EH19	Roadside	549250	221200	NO ₂	Y	N	Y (0.4)	1.05	Y
EH40 ; London Road Co-located with EH19	Roadside	549250	221200	NO ₂	Y	N	Y (0.4)	1.05	Y
EH25 : Old Cross, Hertford	Roadside	532449	212675	NO ₂	Y	N	Y (3.1)	0.92	Y
EH28 : Castle Street, Hertford	Roadside	532542	212370	NO ₂	Y	N	Y (12.5)	2.39	Y
EH48 : Castle Street, Hertford Co-located with EH28	Roadside	532542	212370	NO ₂	Y	N	Y (12.5)	2.39	Y
EH49 ; Castle Street, Hertford Co-located with EH28	Roadside	532542	212370	NO ₂	Y	N	Y (12.5)	2.39	Y
EH30 ; Downey Cottage, Hertford	Roadside	532023	212550	NO ₂	Y	N	Y (1.8)	0.5 \$	Y

East Herts Council

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
EH50 ; Downey Cottage, Hertford Co-located with EH30	Roadside	532023	212550	NO ₂	Y	N	Y (1.8)	0.5 \$	Y
EH51 ; Downey Cottage, Hertford Co-located with EH30	Roadside	532023	212550	NO ₂	Y	N	Y (1.8)	0.5 \$	Y
EH41 ; Ware Road, Hertford	Roadside	533101	212755	NO ₂	Y	N	Y (2.1)	1.08	Y
EH42 ; West Street Hertford	Roadside	532389	212394	NO ₂	Y	N	Y (4.8)	2.75	Y
EH43 ; West Street Hertford Co-located with EH42	Roadside	532389	212394	NO ₂	Y	N	Y (4.8)	2.75	Y
EH44 ; West Street, Hertford Co-located with EH42	Roadside	532389	212394	NO ₂	Y	N	Y (4.8)	2.75	Y
EH52 ; Cowbridge, Hertford	Roadside	532307	212814	NO ₂	Y	N	Y (1.5)	3.2	Y

East Herts Council

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
EH53 ; Viaduct Road, Ware	Roadside	536068	214120	NO ₂	N	N	Y (3.1)	1.83	Y
EH54 ; Station Road, Ware	Roadside	536085	214077	NO ₂	N	N	Y (20.7)	1.75	Y
EH57 ; Junction between Bell Street and London Road Sawbridgeworth	Roadside	548123	214903	NO ₂	N*	N	Y (0.6)	2.75	Y
EH58 ; Junction between Bell Street and London Road Sawbridgeworth Co-located with EH57	Roadside	548123	214903	NO ₂	N*	N	Y (0.6)	2.75	Y
EH59: Cutforth Road Sawbridgeworth	Kerbside	548222	215395	NO ₂	N*	N	Y (1.5) £	3.0	Y
EH60 ; Cutforth Road Sawbridgeworth Co-located with EH59	Kerbside	548222	215395	NO ₂	N*	N	Y (1.5) £	3.0	Y

East Herts Council

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
EH61 ; Cutforth Road Sawbridgeworth Co-located with EH59	Kerbside	548222	215395	NO ₂	N*	N	Y (1.5) £	3.0	Y
EH62 ; Northgate End Bishops Stortford	Roadside	548723	221719	NO ₂	N	N	Y (6.0)	2.5	Y
EH63 : Northgate End Bishops Stortford Co- located with EH62	Roadside	548723	221719	NO ₂	N	N	Y (6.0)	2.5	Y
EH64 ; 79 Rye Street Bishops Stortford	Roadside	548741	222109	NO ₂	N	N	Y (3.9)	1.5	Y
EH65 : 79 Rye Street Bishops Stortford Co- located with EH64	Roadside	548741	222109	NO ₂	N	N	Y (3.9)	1.5	Y
EH66 ; 221 Rye Street Bishops Stortford	Roadside	549163	222731	NO ₂	N	N	Y (0.5) £	1.2	Y

East Herts Council

Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Is monitoring collocated with a Continuous Analyser (Y/N)	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?
221 Rye Street Bishops Stortford Co-located with EH66	Roadside	549163	222731	NO ₂	N	N	Y (0.5) £	1.2	Y
9 Hadham Road Bishops Stortford	Roadside	548611	221541	NO ₂	N	N	Y (0.5)	1.5	Y
9 Hadham Road Bishops Stortford Co-located with EH68	Roadside	548611	221541	NO ₂	N	N	Y (0.5)	1.5	Y

2.2 Comparison of Monitoring Results with Air Quality Objectives

2.2.1 Nitrogen Dioxide

Automatic Monitoring Data

Both the East Herts Background and East Herts Roadside continuous monitoring stations recorded annual mean concentrations below the $40 \mu\text{g}/\text{m}^3$ threshold. In addition, neither sites measured any hourly means in excess of the $50 \mu\text{g}/\text{m}^3$ objective. A graph showing hourly means can be found in Appendix B.

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

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2014 % ^b	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
					2010* ^c	2011* ^c	2012* ^c	2013* ^c	2014 ^c
EH2	East Herts Background	N	100	99.6	16	16	12	17	19
EH3	East Herts Roadside	Y	100	90.2	31	30	41	31	33

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

^c Means should be “annualised” as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

*Annual mean concentrations for previous years are optional.

Figure 2.3 Trends in Annual Mean Nitrogen Dioxide Concentrations measures at Automatic Monitoring Sites

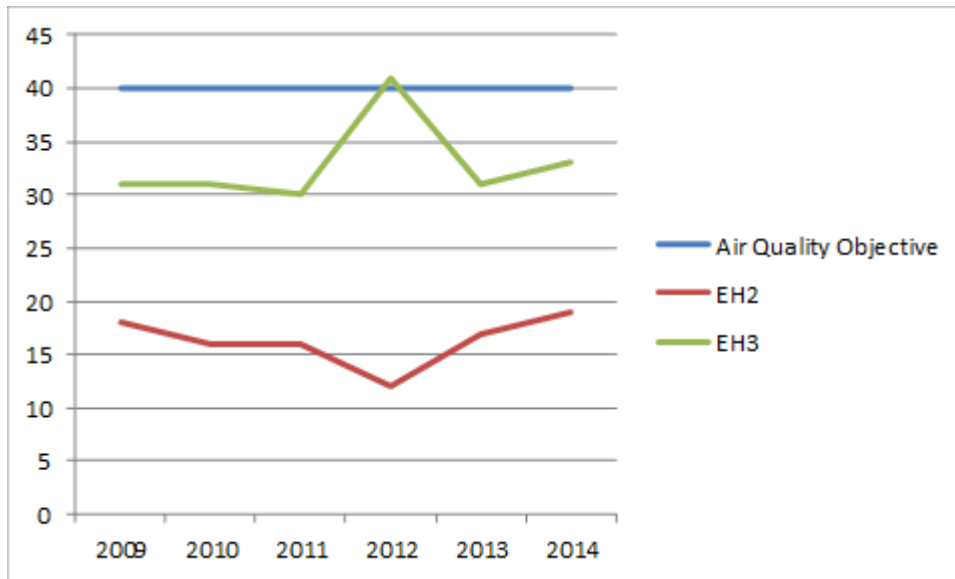


Table 2.4 Results of Automatic Monitoring for Nitrogen Dioxide: Comparison with 1-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for period of monitoring % ^a	Valid Data Capture 2014 % ^b	Number of Exceedences of Hourly Mean (200 µg/m ³)				
					2010* ^c	2011* ^c	2012* ^c	2013* ^c	2014 ^c
EH2	East Herts Background	N	100	96.7	0	0	0	0	0
EH3	East Herts Roadside	Y	100	49.6	0	0	0	0	0

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

^c If the period of valid data is less than 90%, include the 99.8th percentile of hourly means in brackets

*Number of exceedences for previous years are optional.

Diffusion Tube Monitoring Data

East Herts currently have a network of 42 nitrogen dioxide diffusion tubes (in 19 locations), 11 of these locations exceed the annual mean objective of $40\mu\text{g}/\text{m}^3$. All 11 of these locations are already in an AQMA. 4 of the 11 locations in the AQMA recorded annual means in excess of $60\mu\text{g}/\text{m}^3$ 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. Where diffusion tubes are located in duplicate or triplicate, the results presented in Table 2.5 have been averaged. However the result for each individual diffusion tube has been given in Appendix C.

Table 2.5 Results of Nitrogen Dioxide Diffusion Tubes in 2014

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 Number of Months	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91)
								2014 ($\mu\text{g}/\text{m}^3$)
EH12 EH31 EH32	Hockerill Street, Bishops Stortford	roadside	Y	Triplicate	12	N		48
EH14 EH55 EH56	London Road, Sawbridgeworth	roadside	N	Triplicate	12	N		51
EH17 EH35 EH36	Dunmow Road, Bishops Stortford	kerbside	Y	Triplicate	12	N		68
EH18 EH37 EH38	Stansted Road, Bishops Stortford	roadside	Y	Triplicate	12	N		41
EH19 EH39 EH40	London Road Bishops Stortford	roadside	Y	Triplicate	12	N		76
EH25	Old Cross Hertford	kerbside	Y		12	N		41
EH28 EH48 EH49	Castle St Hertford	roadside	Y	Triplicate	12	N		43
EH30 EH50 EH51	Downey Cottage Hertingfordbury Rd	roadside	Y	Triplicate	11 12 12	N		45

East Herts Council

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 Number of Months	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91)
								2014 ($\mu\text{g}/\text{m}^3$)
EH41	Ware Rd Hertford	roadside	Y		12	N		54
EH42 EH43 EH44	West St Hertford	roadside	Y	Triplicate	10 11 10	N		68
EH52	Cowbridge Hertford	roadside	N		12	N		31
EH53	Viaduct Road Ware	roadside	N		12	N		38
EH54	Station Road Ware	roadside	N		12	N		31
EH57 EH58	Opposite Bell Street Sawbridgeworth at crossing	roadside	Y	Duplicate	11	N		68
EH59 EH60 EH61	Cutforth Road Sawbridgeworth	Kerbside	Y	Triplicate	12	N		33
EH62 EH63	Northgate End Bishops Stortford	Roadside	N	Duplicate	11	N		36
EH64 EH65	79 Rye Street Bishops Stortford	Roadside	N	Duplicate	12	N		39

Site ID	Location	Site Type	Within AQMA?	Triplicate or Collocated Tube	Data Capture 2014 Number of Months	Data with less than 9 months has been annualised (Y/N)	Confirm if data has been distance corrected (Y/N)	Annual mean concentration (Bias Adjustment factor = 0.91)
								2014 ($\mu\text{g}/\text{m}^3$)
EH66 EH67	209 Rye Street Bishops Stortford	Roadside	N	Duplicate	12	N		22
EH68 EH69	9 Hadham Road Bishops Stortford	Roadside	N	Duplicate	12	N		38

Table 2.6 Results of Nitrogen Dioxide Diffusion Tubes (2010 to 2014)

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2010 (Bias Adjustment Factor = 0.96)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.97)	2013 (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.91)
EH12	roadside	Y	45	46	46	49	49
EH14	roadside	N	46	42	47	52	51
EH17	kerbside	Y	66	59	60	74	69
EH18	roadside	Y	39	36	41	39	42
EH19	roadside	Y	69	66	67	75	76
EH25	kerbside	Y	41	40	39	44	41
EH28	roadside	Y	40	42	38	50	44
EH30	roadside	Y	41	42	40	45	44
EH31	roadside	Y	46	N/A	46	50	50
EH32	roadside	Y	45	44	48	48	45
EH35	kerbside	Y	68	59	65	74	68
EH36	kerbside	Y	64	61	59	73	67
EH37	roadside	Y	40	37	38	42	41
EH38	roadside	Y	41	35	38	41	41
EH39	roadside	Y	69	65	66	77	76
EH40	roadside	Y	72	67	65	77	76
EH41	roadside	Y	44	44	47	52	54
EH42	roadside	N	51	56	59	66	69
EH43	roadside	N	55	60	56	65	68
EH44	roadside	N	59	55	61	61	68
EH48	roadside	Y	40	38	38	46	42
EH49	roadside	Y	41	39	38	47	42
EH50	roadside	Y	40	39	39	46	46
EH51	roadside	N	40	38	39	45	44
EH52	roadside	N	31	32	31	32	31
EH53	roadside	N	38	36	38	40	38

Site ID	Site Type	Within AQMA?	Annual mean concentration (adjusted for bias) $\mu\text{g}/\text{m}^3$				
			2010 (Bias Adjustment Factor = 0.96)	2011 (Bias Adjustment Factor = 0.89)	2012 (Bias Adjustment Factor = 0.97)	2013 (Bias Adjustment Factor = 0.95)	2014 (Bias Adjustment Factor = 0.91)
EH54	roadside	N	34	28	29	30	31
EH55	roadside	N	44	43	47	53	50
EH56	roadside	N	49	43	46	50	51
EH57	roadside	Y	67	56	61	66	69
EH58	roadside	Y	N/A	55	59	65	68
EH59	roadside	Y	N/A	N/A	N/A	34	33
EH60	roadside	Y	N/A	N/A	N/A	34	33
EH61	roadside	Y	N/A	N/A	N/A	33	34
EH62	roadside	N	N/A	N/A	N/A	33	38
EH63	roadside	N	N/A	N/A	N/A	37	35
EH64	roadside	N	N/A	N/A	N/A	38	40
EH65	roadside	N	N/A	N/A	N/A	40	38
EH66	roadside	N	N/A	N/A	N/A	22	22
EH67	roadside	N	N/A	N/A	N/A	22	23
EH68	roadside	N	N/A	N/A	N/A	38	39
EH69	roadside	N	N/A	N/A	N/A	39	37

2.2.2 PM₁₀

East Herts Council met the annual objective and the 24 hour mean objective for PM₁₀ at all locations monitored.

Table 2.7 Results of Automatic Monitoring of PM₁₀: Comparison with Annual Mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2014 % ^b	Confirm Gravimetric Equivalent (Y or NA)	Annual Mean Concentration $\mu\text{g}/\text{m}^3$				
						2010* ^c	2011* ^c	2012* ^c	2013* ^c	2014 ^c
EH2	East Herts Background	N	96.7	96.7	Y	17	14	13	18	17
EH3	East Herts Roadside	Y	49.6	49.6	Y	23	21	25	24	N/A

^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

^c Means should be “annualised” as in Box 3.2 of TG(09), if monitoring was not carried out for the full year.

* Optional

Table 2.8 Results of Automatic Monitoring for PM₁₀: Comparison with 24-hour mean Objective

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period % ^a	Valid Data Capture 2014 % ^b	Confirm Gravimetric Equivalent	Number of Exceedences of 24-Hour Mean (50 µg/m ³)				
						2010* ^c	2011* ^c	2012* ^c	2013* ^c	2014 ^c
EH2	East Herts Background	N	96.7	96.7	Y	0	0	14	2	5
EH3	East Herts Roadside	Y	49.6	49.6	Y	0	0	4	6	4

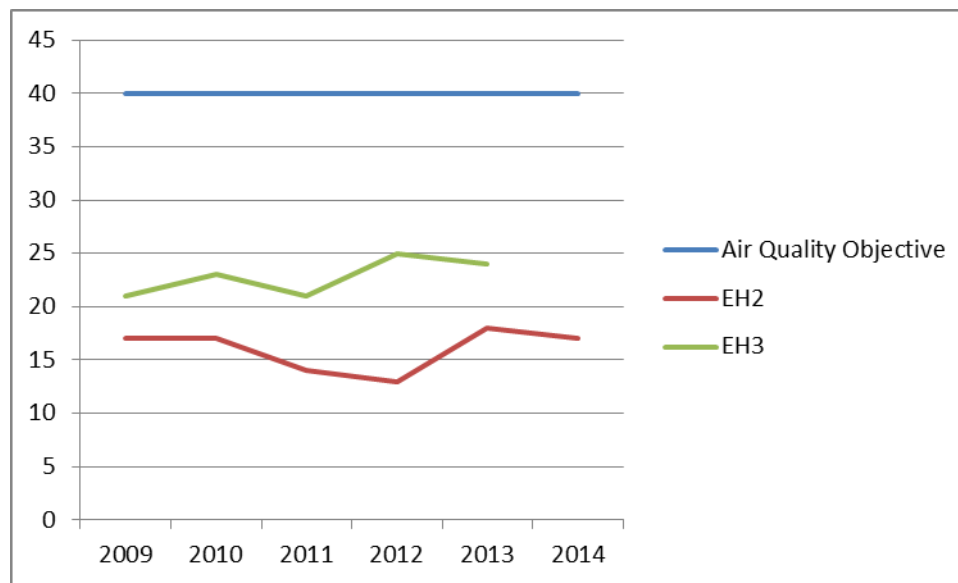
^a i.e. data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

^b i.e. data capture for the full calendar year (e.g. if monitoring was carried out for six months the maximum data capture for the full calendar year would be 50%).

^c if data capture is less than 90%, include the 90th percentile of 24-hour means in brackets

* Optional

Figure 2.5 Trends in Annual Mean PM₁₀ Concentrations



2.2.3 Sulphur Dioxide

East Herts Council does not monitor Sulphur Dioxide.

2.2.4 Benzene

East Herts Council does not monitor Benzene

2.2.5 Other pollutants monitored

Ozone has been monitored in a rural school in Anstey since January 2011. Ozone is not emitted directly from any man made source in significant quantities, but is formed by a complex set of reactions involving nitrogen oxides and hydrocarbons in the presence of light from the sun. Once formed, ozone can remain in atmosphere for many days and is often transported over long distances. It is for this reason that a real reduction in ozone levels can only be achieved through global action by everyone. Ozone is therefore not a pollutant currently in the Air Quality Regulations. It is however still considered when looking at air quality. The results of the ozone monitoring for 2014 are given below. They have been compared to the Air Quality (England) Regulations 2000 & (Amendment) Regulations 2002. Where the daily maximum running 8 hour mean should not exceed $100 \mu\text{g}/\text{m}^3$ more than 10 days per year

Table 2.9 Results of Automatic Monitoring for Ozone

Site ID	Site Type	Within AQMA?	Valid Data Capture for monitoring Period %	Valid Data Capture 2014 %	No of Days >100µg/m ³	Daily maximum running 8 hour mean(µg/m ³)
Anstey Junior School	Rural	N	69.2	69.2	8	118

2.2.6 Summary of Compliance with AQS Objectives

East Herts Council has examined the results from monitoring in the district. Concentrations outside of the AQMA are all below the objectives at relevant locations, therefore there is no need to proceed to a Detailed Assessment.

3 Road Traffic Sources

3.1 Narrow Congested Streets with Residential Properties Close to the Kerb

In 2009 as recommended in TG (09) a rudimentary 5 minute count in the middle of the day was carried out on a number of narrow congested streets with residential properties within 2m of the kerb. A count of 35 vehicles or more within 5 minutes indicates whether or not the traffic flow will exceed 5000 vehicles per day. No roads were identified using this method. Another count was done in 2014 on the High Street in Buntingford and the same result was reached.

East Herts confirms that there are no new/newly identified congested streets with a flow above 5,000 vehicles per day and residential properties close to the kerb, that have not been adequately considered in previous rounds of Review and Assessment.

3.2 Busy Streets Where People May Spend 1-hour or More Close to Traffic

In 2009 the procedure outlined in TG (09) was followed in areas where outdoor seating is provided near traffic. No areas met the specified criteria. There has been no change in the district 2009 that would require further assessment to be made.

East Herts confirms that there are no new/newly identified busy streets where people may spend 1 hour or more close to traffic.

3.3 Roads with a High Flow of Buses and/or HGVs.

Traffic data has been supplied by Hertfordshire County Council and can be found in Appendix C.

East Herts Council confirms that there are no new/newly identified roads with high flows of buses/HGVs.

3.4 Junctions

Traffic data has been supplied by Hertfordshire County Council and can be found in Appendix C.

East Herts Council confirms that there are no new/newly identified busy junctions/busy roads.

3.5 New Roads Constructed or Proposed Since the Last Round of Review and Assessment

No new roads have been constructed since the USA in 2012. However a road is proposed to by-pass Little Hadham. This should reduce congestion in Little Hadham and improve air quality in the area. Hertfordshire Highways will be carrying out monitoring to confirm this.

East Herts confirms that there are no new/proposed roads.

3.6 Roads with Significantly Changed Traffic Flows

Traffic data has been supplied by Hertfordshire County Council and can be found in Appendix B.

East Herts Council confirms that there are no new/newly identified roads with significantly changed traffic flows.

3.7 Bus and Coach Stations

No new bus or coach stations have been developed since the USA in 2012.

East Herts Council confirms that there are no relevant bus stations in the Local Authority area.

4 Other Transport Sources

4.1 Airports

There are no airports in East Hertfordshire, London Stansted Airport in neighbouring Uttlesford district is very close to the border and so required investigation. However, there is no relevant exposure in East Hertfordshire within 1km of the airport boundary (Road traffic to and from the airport are included in the assessment of road traffic sources).

East Herts confirms that there are no airports in the Local Authority area.

4.2 Railways (Diesel and Steam Trains)

4.2.1 Stationary Trains

East Herts Council have looked at areas where diesel trains could possibly be stationary with its engine running for 15 minutes or more on a regular basis. East Herts have not identified areas within 15m of the stationary locomotives where regular risk of exposure to individuals would occur.

East Herts confirms that there are no locations where diesel or steam trains are regularly stationary for periods of 15 minutes or more, with potential for relevant exposure within 15m.

4.2.2 Moving Trains

Technical Guidance LAQM.TG(09) identifies train lines with a substantial number of passenger trains per day. These train lines are not in East Herts.

East Herts Council confirms that there are no locations with a large number of movements of diesel locomotives, and potential long-term relevant exposure within 30m.

4.3 Ports (Shipping)

East Herts Council confirms that there are no ports or shipping that meet the specified criteria within the Local Authority area.

5 Industrial Sources

5.1 Industrial Installations

5.1.1 New or Proposed Installations for which an Air Quality Assessment has been Carried Out

East Herts Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

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

East Herts Council confirms that there are no industrial installations with substantially increased emissions or new relevant exposure in their vicinity within its area or nearby in a neighbouring authority.

5.1.3 New or Significantly Changed Installations with No Previous Air Quality Assessment

East Herts Council confirms that there are no new or proposed industrial installations for which planning approval has been granted within its area or nearby in a neighbouring authority.

5.2 Major Fuel (Petrol) Storage Depots

There are no major fuel (petrol) storage depots within the Local Authority area.

5.3 Petrol Stations

There are no petrol stations in East Herts which have an annual throughput of more than 2 million litres and are situated next to a road with more than 30, 000 vehicles per day.

East Herts Council confirms that there are no petrol stations meeting the specified criteria.

5.4 Poultry Farms

East Herts Council recognise that there are no poultry farms within the district which house

- 400,000 birds with mechanical ventilation.
- 200,000 birds with natural ventilation
- 100,000 turkeys.

East Herts Council confirms that there are no poultry farms meeting the specified criteria.

6 Commercial and Domestic Sources

6.1 Biomass Combustion – Individual Installations

East Herts has not received a notification regarding biomass combustion plant since the USA in 2012.

East Herts Council confirms that there is no new biomass combustion plant in the Local Authority area.

6.2 Biomass Combustion – Combined Impacts

East Herts has not received a notification regarding biomass combustion plant since the USA in 2012.

East Herts Council confirms that there are no biomass combustion plants in the Local Authority area.

6.3 Domestic Solid-Fuel Burning

The 2004 housing stock condition survey states that 0.8% of the domestic dwellings in East Herts use solid fuel for their main heating system. A worst case scenario would be to consider 0.8% of dwellings in a 500m x 500m area, burning coal in a fireplace. The source is significantly below the threshold in the nomogram provided in TG (09). Consequently a large proportion of the surface area would have to be heated using solid fuel to consider an exceedance. The 2009 housing stock condition survey did not indicate a significant increase in the number of dwellings that use solid fuel for their main heating system.

East Herts Council confirms that there are no areas of significant domestic fuel use in the Local Authority area.

7 Fugitive or Uncontrolled Sources

East Herts Council confirms that there are no potential sources of fugitive particulate matter emissions in the Local Authority area.

8 Conclusions and Proposed Actions

8.1 Conclusions from New Monitoring Data

The annual mean concentration at both monitoring sites is below the 40 µg/m³ threshold. The daily mean did not exceed 50µg/m³ at any time in 2014. The annual mean objective of 40µg/m³ was exceeded at 11 locations. All 11 are already in an AQMA. A detailed assessment is not required as a consequence of this report.

8.2 Conclusions from Assessment of Sources

The assessment of new or significantly changed sources, where applicable, did not identify any potential exceedences outside existing AQMAs.

8.3 Proposed Actions

The next course of action is

- Work with Herts County Council to
 - Update Air Quality Action Plans for Hertford and Bishop's Stortford AQMA
 - Develop an Action plan for the newly declared AQMA in Sawbridgeworth
- Submit 2016 Progress Report
- Close the air quality monitors stations at Sawbridgeworth and Anstey
- Open a new air quality monitoring station in Hertford to monitor Nitrogen Dioxides, and Particulate Matter.

9 References

1. Part IV of Environment Act 1995: Local Air Quality Management. Technical Guidance LAQM.TG (09). Defra, February 2009.
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.

Appendices

Appendix A: QA/QC Data

A1 - Diffusion Tubes Bias Adjustment Factor

The National Diffusion Tube Bias Adjustment Spreadsheet calculated 0.91 as the Bias Adjustment figure for 2014 where tubes are provided by Gradko and use a 20% TEA in Water preparation.

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/15			
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 at the end of June 2015 Local Air Quality Management			
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 If a laboratory is not shown, we have no data for this laboratory.		Select a Preparation Method from the Drop-Down List If a preparation method is not shown, we have no data for this method at this laboratory.	Select a Year from the Drop-Down List If a year is not shown, we have no data.	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 shown in blue at the foot of the final column. 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 LAQM/Helpdesk@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 w ater	2014	UC	Belfast City Council	11	33	32	5.6%	G	0.95
Gradko	20% TEA in w ater	2014	R	Borough Council of King's Lynn & West Norfolk	12	29	21	37.7%	G	0.73
Gradko	20% TEA in w ater	2014	R	Brighton & Hove City Council	12	55	48	15.2%	G	0.87
Gradko	20% TEA in w ater	2014	R	Brighton & Hove City Council	11	60	57	6.2%	G	0.94
Gradko	20% TEA in w ater	2014	R	Cheshire West and Chester	11	40	40	-1.0%	G	1.01
Gradko	20% TEA in w ater	2014	R	Dudley MBC	12	36	31	18.1%	G	0.85
Gradko	20% TEA in w ater	2014	UB	Dudley MBC	12	26	23	11.2%	G	0.90
Gradko	20% TEA in w ater	2014	R	Dudley MBC	12	41	35	15.2%	G	0.87
Gradko	20% TEA in w ater	2014	R	Dudley MBC	12	52	60	-12.6%	G	1.14
Gradko	20% TEA in w ater	2014	R	Gateshead Council	10	35	32	10.8%	G	0.90
Gradko	20% TEA in w ater	2014	R	Gateshead Council	12	36	36	-0.1%	G	1.00
Gradko	20% TEA in w ater	2014	R	Gateshead Council	12	34	32	6.4%	G	0.94
Gradko	20% TEA in w ater	2014	UB	Luton Borough Council	9	36	37	-4.0%	G	1.04
Gradko	20% TEA in w ater	2014	KS	Marylebone Road Intercomparison	12	115	80	42.8%	G	0.70
Gradko	20% TEA in w ater	2014	R	Monmouthshire County Council	10	42	38	10.1%	G	0.91
Gradko	20% TEA in w ater	2014	R	NOTTINGHAM CITY COUNCIL	12	44	39	14.9%	G	0.87
Gradko	20% TEA in w ater	2014		Overall Factor⁵ (16 studies)					Use	0.91

A2 - PM Monitoring Adjustment

Results obtained from the TEOM analysers were corrected using the Kings College Volatile correction model (VCM). This model allows the correction of TEOM measurements for the loss of volatile components of particulate matter that occur due to the high sampling temperatures employed by this instrument. The resulting corrected measurements have been demonstrated as equal to gravimetric reference equivalent.

A3 - QA/QC of Automatic Monitoring

Officers from East Herts Council undertook calibrations of the analysers in 2013. SupportingU were contracted to undertake 6 monthly calibration and maintenance all analysers.

Results were validated and ratified by Air Quality Data Management (AQDM) who has provided this information regarding the procedures used:

Air quality measurements from automatic instruments are ratified to the standards described in the Local Air Quality Management – Technical Guidance LAQM TG(09).

Validation

This process operates on data during the data collection stage. All data are continually screened algorithmically and manually for anomalies. There are several techniques designed to discover spurious and unusual measurements within a very large dataset. These anomalies may be due to equipment failure, human error, power failures, interference or other disturbances Automatic screening can only safely identify spurious results that need further manual investigation.

Raw data from the gaseous instruments (e.g. NO_x, O₃, SO₂ and CO) are scaled into concentrations using the latest values derived from the manual and automatic calibrations. These instruments are not absolute and suffer drifts. Both the zero baseline (background) and the sensitivity change with time. Regular calibrations with certified gas standards are used to measure the zero and sensitivity. However, these

are only valid for the moment of the calibration since the instrument will continue to drift. Raw measurements from particulate instruments (e.g. PM10 and PM2.5) generally do not require scaling into concentrations. The original raw data are always preserved intact while the processed data are dynamically scaled and edited.

Ratification

This is the process that finalises the data to produce the measurements suitable for reporting. All available information is critically assessed so that the best data scaling is applied and all anomalies are appropriately edited. Generally this operates at three, six or twelve month intervals. However, unexpected faults can be identified during the instrument routine services or independent audits which are often at 6-monthly intervals. In practice, therefore, the data can only be fully ratified in 12-month or annual periods. The data processing performed during the three and six monthly cycles helps build a reliable dataset that is finalised at the end of the year.

There is a diverse range of additional information that can be essential to the correct understanding and editing of data anomalies. These may include

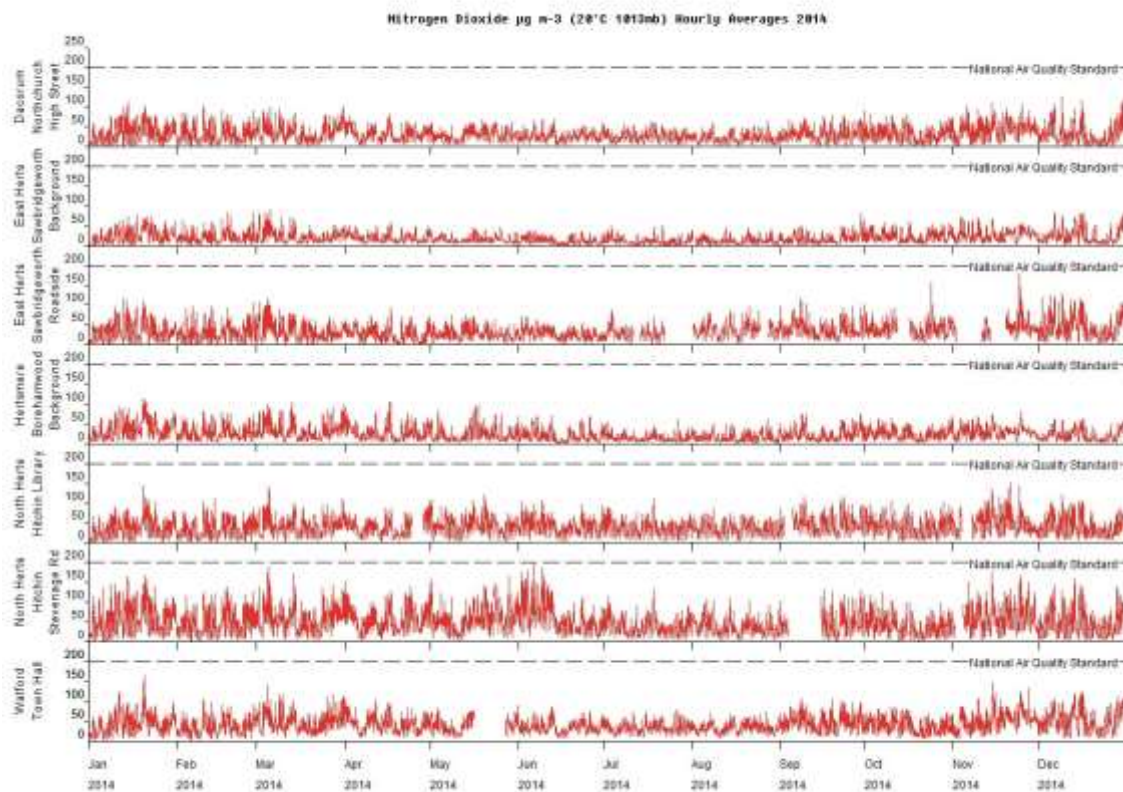
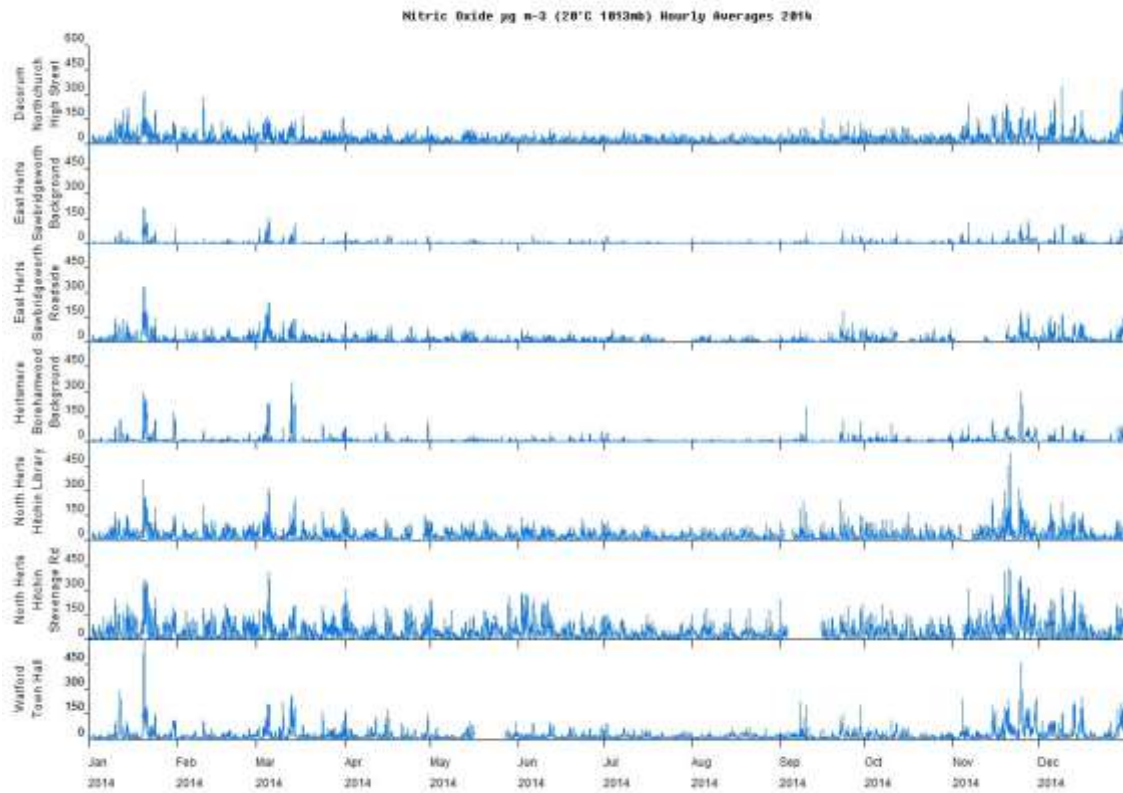
- the correct scaling of data
- ignoring calibrations that were poor e.g. a spent zero scrubber
- closely tracking rapid drifts or eliminating the data
- comparing the measurements with other pollutants and nearby sites
- corrections due to span cylinder drift
- corrections due to flow drifts for the particulate instruments
- corrections for ozone instrument sensitivity drifts
- eliminating measurements for NO₂ conversion inefficiencies
- eliminating periods where calibration gas is in the ambient dataset
- identifying periods where instruments are warming-up after a power cut
- identification of anomalies due to mains power spikes
- correcting problems with the date and time stamp
- observations made during the sites visits and services

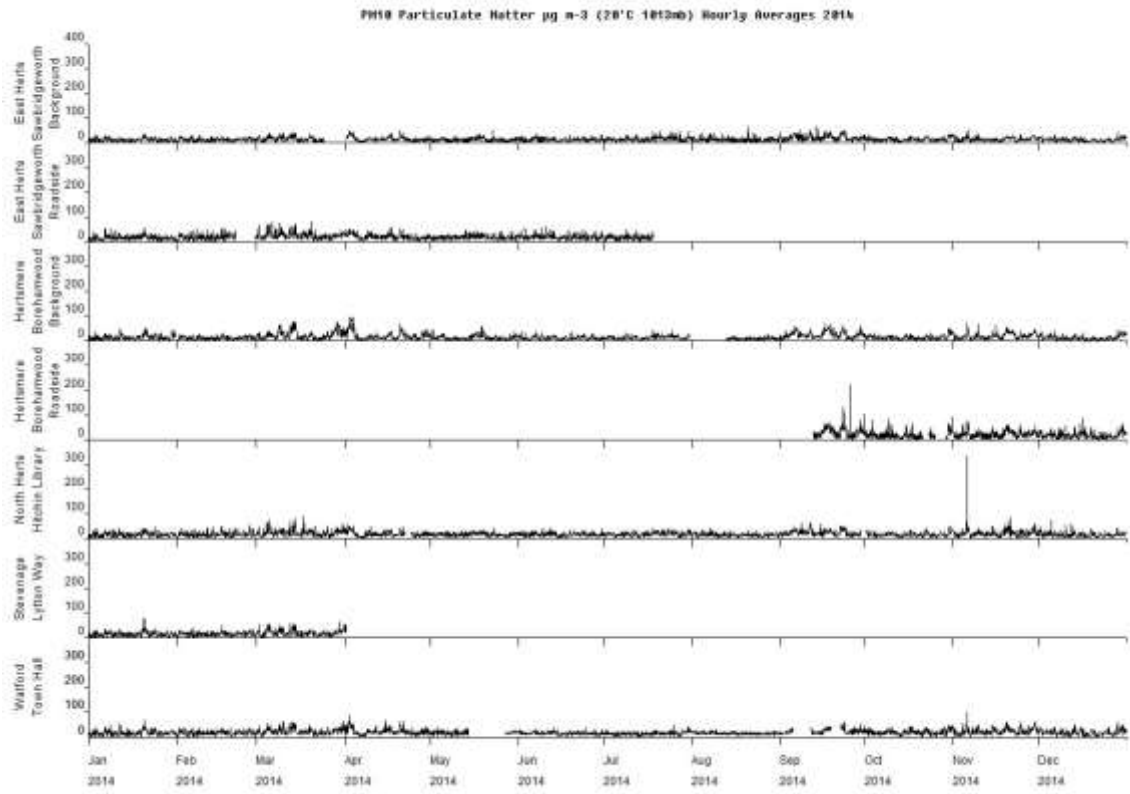
The identification of data anomalies, the proper understanding of the effects and the application of appropriate corrections requires expertise gained over many years of operational experience. Instruments and infrastructure can fail in numerous ways that

significantly and visually affect the quality of the measurements. There are rarely simple faults that can be discovered by computer algorithms or can be understood without previous experience.

Further information about air quality data management, expert data ratification and examples of bad practices are given on the Air Quality Data Management (AQDM) website <http://www.aqdm.co.uk>.

Appendix B: Graphs from Automatic Monitoring Stations





Appendix C: Hertfordshire County Council Traffic Data

Site	Location	Road	Road Type Name	Easting	Northing	AAWD 2010	AAWD 2011	AAWD 2012	AAWD 2013	% Change 2012-2013
140	Ware Road, Hailey	A1170	Other A	537130	211030	15,936	14,848	15,003	14,863	-0.93%
144	By Pass, Hay Street	A10	Primary A	538180	225900	17,142	17,251	16,174	17,160	6.10%
147	Cambridge Road, Harlow	A1184	Other A	547150	213000	18,337	18,154	18,504	18,325	-0.97%
149	London Road, Spellbrook	A1184	Other A	548700	217770	18,095	17,773	17,808	17,771	-0.21%
150	Stanstead Road, Bishop's Stortford	B1383	B Road	549650	222700	11,411	11,407	11,244	11,933	6.13%
201	Hertford Road, Ware	A119	Other A	535317	213924	10,081	10,086	10,163	10,154	-0.09%
204	Stortford Rd, Lt Hadham	A120	Primary A	545300	222320	15,578	15,706	15,197	15,296	0.65%
205	Dunmow Rd, B Stortford	A1250	Other A	550900	221540	17,166	17,045	17,669	17,749	0.45%
228	Eastwick Road, Eastwick	A414	Primary A	543320	211460	28,439	28,522	28,121	28,772	2.31%
229	High Wych Road, High Wych	C161	C Road	547170	214190	10,291	9,966	9,965	10,308	3.44%
311	Birchall Lane, Cole Green	B195	B Road	527459	211578	11,404	13,029	12,721	14,017	10.19%
338	Paynes Hall, Ware	A602	Primary A	533750	216450	22,216	21,445	21,510	22,625	5.18%
536	Wadesmill Bypass	A10	Primary A	537302	220081	23,872	25,062	23,970	23,840	-0.54%
558	RUSH GREEN	A10	Primary A	536130	212230	45,536	45,874	44,750	42,833	-4.28%
599	Bishops Stortford Bypass	A120	Primary A	548900	223400	18,987	19,133	18,642	18,259	-2.05%
608	Bypass North Cole Green	A414	Primary A	528053	211922	26,454	26,559	26,613	27,315	2.64%
610	St James Way, Bishops Stortford	A1184	Other A	548298	218686	8,952	9,248	8,862	9,234	4.20%
709	High Wych Road, High Wych	C161	C Road	546390	214120	11,162	11,073	8,908	10,674	19.82%
724	Cambridge Road, Sawbridgeworth	A1184	Other A	548212	215377	19,219	19,251	18,318	18,863	2.98%