

2017 Air Quality Annual Status Report (ASR)

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

July 2017

Local Authority Officer	Ann Lee-Moore
Department	Environmental Health
Address	Council Offices London Road Saffron Walden CB11 4ER
Telephone	01799 510588
E-mail	aleemoore@uttlesford.gov.uk
Report Reference number	UTT/ASR2017
Date	24 th July 2017
Written by	Tim Savage
Scientific Team Public Health & Protection Services Chelmsford City Council Duke Street Chelmsford Essex Cm1 1JE	 <p>The logo for Chelmsford City Council features a stylized graphic on the left consisting of a green leaf, a blue wave, and a purple arc. To the right of the graphic, the word "Chelmsford" is written in a large, bold, purple font, and "City Council" is written in a smaller, purple font below it.</p>

Executive Summary: Air Quality in Our Area

The 2017 Annual Status Report is designed to provide the public with information relating to local air quality in Uttlesford, to fulfil Uttlesford District Council's statutory duty to review and assess air quality within its area, and to determine whether or not the air quality objectives are likely to be achieved.

In 2016, five monitoring locations exceeded the $40\mu\text{g}/\text{m}^3$ Air Quality Objective for Nitrogen Dioxide however it is predicted that there are only two locations that exceed this level at relevant exposure (façade of residential property).

These locations are UT004 Saffron Walden YHA at $41.24\mu\text{g}/\text{m}^3$ and UT028 London Road at $42.55\mu\text{g}/\text{m}^3$, both of which are inside of the declared AQMA.

Air Quality in Uttlesford

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.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion¹.

Uttlesford is considered to be rural in nature and has the principal town of Saffron Walden as its administrative centre. Uttlesford is dissected by the M11 motorway and A120 trunk road which support Stansted International Airport in the south of the district.

Traffic emissions are the most significant source of air pollution within the district and within Saffron Walden, the historic layout of the town results in problems with traffic flow and congestion particularly at peak times.

Uttlesford has one Air Quality Management Area (AQMA) within the Saffron Walden town centre, declared for Nitrogen Dioxide (NO₂) exceedances.

The Council has developed a new Action Plan which was consulted upon in 2016 and approved by the Cabinet Committee. However, the plan was 'called in' to be reviewed by the Scrutiny Committee with a view to aligning the Action Plan to recent developments in the emerging Local Plan.

¹ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

In 2016 there has been an upwards spike in nitrogen dioxide concentrations monitored across the district. This can be seen in Figure A.2 in Appendix A. However, it is important to view air quality over the long term as bias adjustment and meteorological variation can influence pollutant concentrations significantly.

Actions to Improve Air Quality

The draft Action Plan for the Saffron Walden AQMA included measures to develop planning policies and an Air Quality Technical Planning Guidance document to support the draft policies, both of which reflect the National Planning Policy Framework guidance on air pollution. This document was produced in 2016 and will remain in draft until the Local Plan is finalised, at which point it will also become a final document. The guidance has been circulated for comment to the planning officers involved in the development of the Local Plan and will form part of the documentation for the public consultation phase of the Local Plan.

Air quality issues are routinely considered in response to planning consultations within the existing policy framework and where appropriate planning conditions are included to require electric vehicle charging points into new developments and provision for safe storage of cycles. Sec 106 agreements are secured where possible for Travel Plans and contributions to off-site mitigation to minimise emissions.

Partnership working

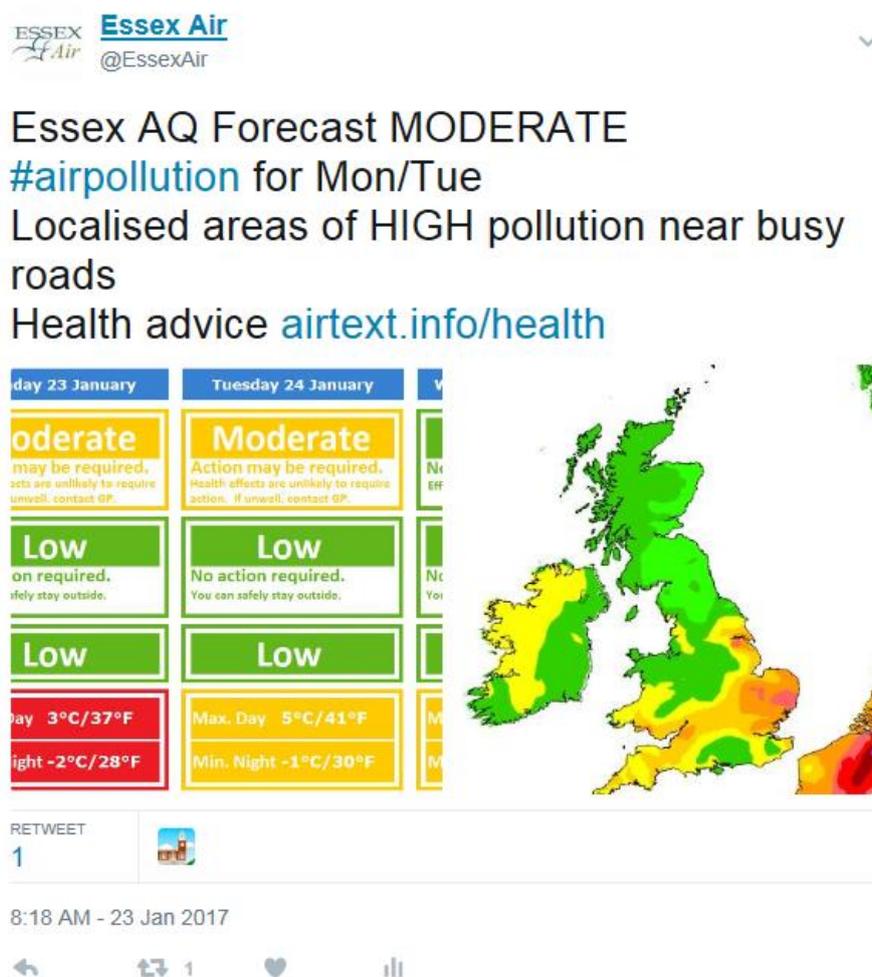
Essex County Council: The Council continues to engage with the highways team to ensure options for appropriate traffic infrastructure alterations are developed to reduce congestion and support the draft Local Plan.

Public Health: The inclusion of air quality by Department of Health as an indicator for public health is intended to encourage action to improve air quality nationally and to raise awareness of its effects on how well people live at all stages of life. Public health colleagues have been involved with development of draft local plan policies aimed to ensure the health impact of development is fully considered, and with promoting non-car travel. Increasing the number of walking and cycling journeys to access school, workplaces or amenities would have wider benefits for an individual's health and wellbeing associated with increased activity

Local Engagement and How to get Involved

Uttlesford District Council is a member of the Essex Air Quality consortium. The purpose of the Essex Air is to promote improvements in air quality related issues. The Essex Air [web site](#) provides a daily forecast of air pollution. Also, the [@EssexAir](#) twitter feed provides localised weekly air pollution forecasts.

Figure i.1 - Essex Air Twitter Air Quality Notifications



Links to Defra recommended actions and health advice are provided when air pollution is likely to be moderate or higher. This will enable those with heart or lung conditions, or other breathing problems to make informed judgements about their levels of activity or exposure.

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Uttlesford	i
Actions to Improve Air Quality	ii
Local Engagement and How to get Involved	iii
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
2.1 Air Quality Management Areas.....	2
2.2 Progress and Impact of Measures to address Air Quality in Uttlesford	3
2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations.....	5
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	6
3.1 Summary of Monitoring Undertaken	6
3.1.1 Automatic Monitoring Sites	6
3.1.2 Non-Automatic Monitoring Sites.....	6
3.2 Individual Pollutants	7
3.2.1 Nitrogen Dioxide (NO ₂).....	7
3.2.2 Particulate Matter (PM ₁₀).....	8
3.2.3 Particulate Matter (PM _{2.5})	8
Appendix A: Monitoring Results	9
Appendix B: Full Monthly Diffusion Tube Results for 2016	21
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	23
Appendix D: Map(s) of Monitoring Locations and AQMAs	26
Appendix E: Summary of Air Quality Objectives in England	29
Glossary of Terms	30
References	31

List of Tables

Table 2.1 – Declared Air Quality Management Areas.....	2
Table 2.2 – Progress on Measures to Improve Air Quality	4
Table 3.1 - Monitored Exceedances	7
Table A.1 - Details of Automatic Monitoring Sites.....	9
Table A.2 - Details of Non-Automatic Monitoring Sites	10
Table A.3 - Annual Mean NO ₂ Monitoring Results.....	12
Table A.4 - 1-Hour Mean NO ₂ Monitoring Results	16
Table A.5 - Annual Mean PM ₁₀ Monitoring Results	17
Table A.6 - 24-Hour Mean PM ₁₀ Monitoring Results.....	19
Table A.7 - PM _{2.5} Monitoring Results.....	19
Table B.1 - NO ₂ Monthly Diffusion Tube Results - 2016.....	21
Table C.1 - AIR PT Results 2016	24
Table C.2 - UTT2 NO ₂ Annualisation.....	25
Table C.3 - UTT3 NO ₂ Annualisation.....	25
Table C.4 - UTT4 NO ₂ Annualisation.....	25
Table E.1 - Air Quality Objectives in England.....	29

List of Figures

Figure i.1 – Essex Air Twitter Air Quality Notifications	iii
Figure A.1 - Trends in Annual Mean NO ₂ Concentrations at Automatic Monitoring Stations.....	14
Figure A.2 - Trends in Annual Mean NO ₂ Concentrations at 2016 Exceedance Sites	15
Figure A.3 – Trends in Annual Mean PM ₁₀ Concentrations	18
Figure A.4 - Trends in Annual Mean PM _{2.5} Concentrations at UTT129.....	20
Figure C.1 – Local Bias Adjustment Calculation.....	24
Figure D.1 - Saffron Walden AQMA and Monitoring Locations.....	26
Figure D.2 – Newport Monitoring Location	27
Figure D.3 – Other Monitoring Locations.....	28

1 Local Air Quality Management

This report provides an overview of air quality in Uttlesford during 2016. 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 Uttlesford District 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 (AQMA) 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 the current AQMA declared by Uttlesford District Council can be found in Table 2.1. A map of the current AQMA can be found in Appendix D along with monitoring locations within the area.

Further information related to declared or revoked AQMA, including maps of AQMA boundaries are available [online](#).

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan (inc. date of publication)
						At Declaration	Now	
Saffron Walden AQMA	Declared 01/08/2007 Amended 12/09/2012	NO ₂ annual mean	Saffron Walden	Circle of radius 1400m radius centred on Elm Grove in Saffron Walden Town Centre. Revokes and replaces 3 previous Uttlesford AQMA	No	42.90µg/m ³	44.76µg/m ³	The Action Plan will be posted on UDC website once adopted Uttlesford DC Air Quality web page

Uttlesford District Council confirm the information on UK-Air regarding their AQMA(s) is up to date

2.2 Progress and Impact of Measures to address Air Quality in Uttlesford

Details of all measures in progress or planned are set out in Table 2.2.

Uttlesford District Council's priorities for the coming year are:

- Adoption of the new AQAP
- Work towards delivering measures set out within the new AQAP

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Developing Air Quality Action Plan	Policy guidance and development control	Air Quality and Policy Guidance	Uttlesford District Council	2016	2017	Adoption of AQAP	Under development	In progress	2017	
2	Member of Essex Air	Policy guidance and development control	Regional Groups Co-ordinating programs to develop Area-wide Strategies to reduce emissions and improve air quality	Local Authorities within Essex	N/A	N/A	N/A	N/A	Ongoing	N/A	
3	Essex Liftshare	Alternatives to private vehicle use	Car & lift sharing schemes	Essex County Council	N/A	2014	Number of Users	Unknown	Ongoing	N/A	
4	Developing air quality policies for draft Local Plan	Policy Guidance and Development	Air Quality and Policy Guidance	Uttlesford District Council	2016	2017	Policies contained in the Local Plan once adopted. Use of sec 106 funds to implement action plan	In development	In Progress	2017	
5	Developing air quality technical guidance for developers to support draft Local Plan	Policy Guidance and Development Control	Air Quality Technical Guidance	Uttlesford District Council	2016	2017	Publicly available by December 2017	N/A	Available for consultation	2017	
6	Partnership working with Public Health and ECC	Traffic Management, Public Information	Congestion management	Uttlesford District Council Essex County Council	N/A	N/A	N/A	N/A	Ongoing	N/A	

2.3 PM_{2.5} – 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_{2.5} (particulate matter with an aerodynamic diameter of 2.5µm or less). There is clear evidence that PM_{2.5} has a significant impact on human health, including premature mortality, allergic reactions, and cardiovascular diseases.

Uttlesford District Council monitors PM_{2.5} concentrations within Saffron Walden. Monitored levels (annual mean) are below 20µg/m³.

The Council notes the Public Health Outcomes Framework indicator 3.01 – Fraction of mortality attributable to particulate (PM_{2.5}) air pollution which for 2015 gave a value of 5.2% which has reduced from 5.5% in 2013. These values are broadly similar to other authorities within the region.

Uttlesford District Council is taking the following measures to address PM_{2.5}:

- Regular inspections of industrial processes permitted by Uttlesford District Council where combustion and non-combustion processes could lead to anthropogenic emissions of PM_{2.5}
- Working with Essex County Council (highway authority) to deliver Major improvement schemes. In addition to reduced exhaust emissions, these schemes will reduce non-exhaust emissions from brake and tyre wear by making traffic flows smoother.
- An Action Plan has been prepared in respect of the Saffron Walden AQMA. Whilst the action plan measures are primarily aimed at reducing the exposure of residents within the AQMA to NO₂, the initiatives within it will have a positive effect on the reduction of PM_{2.5}.

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.

Uttlesford District Council undertook automatic (continuous) monitoring at three sites during 2016. Table A.1 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 how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Uttlesford District Council undertook non-automatic (passive) monitoring of NO₂ at 26 sites during 2016. Table A.2 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D.

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 bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO₂)

Exceedances of the Air Quality Objectives occurred at the diffusion tube monitoring sites of UT001, UT004, UT005, UT009 and UT028 in 2016. With the exception of UT009 Burton End these sites are within the AQMA.

The following table 3.1 identifies the exceedances;

Table 3.1 – Monitored Exceedances

Site	Annual Mean (Bias Adjusted & Annualised where appropriate)	Estimation of Concentration at the Receptor.
UT001 PO High Street	40.04 µg/m³	27.73 µg/m ³
UT004 YHA Saffron Walden	46.90 µg/m³	41.24 µg/m³
UT005 Thaxted Road Saffron Walden	47.52 µg/m³	37.92 µg/m ³
UT009 Burton End	43.04 µg/m³	35.31 µg/m ³
UT028 London Road	44.76 µg/m³	42.55 µg/m³

Estimating the concentration at the receptor by making a NO₂ fall off calculation shows that there were no exceedances found at the receptor outside of an AQMA.

Details of the NO₂ fall off calculations can be found in Appendix C.

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 6 years with the air quality objective of 40µg/m³.

Table A.4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 6 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year. There have been no exceedances of the 1-hr mean objective or annual mean objective in excess of 60µg/m³, which is an indication that an exceedance of the 1-hour mean objective could have occurred.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B including estimated concentrations at the receptor.

3.2.2 Particulate Matter (PM₁₀)

Uttlesford District Council monitors for PM₁₀ at two locations.

Table A.1 in Appendix A provides details of these sites.

Table A.5 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 6 years with the air quality objective of 40µg/m³.

Table A.6 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 6 years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

No exceedances of the PM₁₀ annual or daily objective have been identified.

3.2.3 Particulate Matter (PM_{2.5})

Uttlesford District Council monitors for PM_{2.5} within the Saffron Walden AQMA.

Table A.7 in Appendix A presents the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past 3 years.

Monitored levels (annual mean) are routinely below 20µg/m³.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
UTT1	Saffron Walden Hill St	Roadside	553825	238409	NO _x , NO, NO ₂ ; PM _{2.5}	Y	Chemiluminescent; BAM (with Smart Heater)	25	4.1	2.0
UTT2	Takeley	Urban Background	556234	221496	NO _x , NO, NO ₂ ; PM ₁₀	N	Chemiluminescent, BAM	15	50	2.0
UTT3	Mobile Unit London Road Saffron Walden	Roadside	551496	222208	NO _x , NO, NO ₂ ; PM ₁₀	N	Chemiluminescent, BAM	6	3	2.8

Notes:

(1) 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).

(2) N/A if not applicable.

UTT2 – Relevant exposure is 21m nearer the road than the monitoring location – This is used as a negative value for the purposes of estimating the drop off of concentrations over distance

Table A.2 – Details of Non-Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
UT001	High Street	Urban Centre	553709	238417	NO ₂	Yes	15	1.5	No	2.0
UT002	Airport 1 Thatched Cottage	Roadside	552706	221403	NO ₂	No	1	10	No	2.0
UT003	Gibson Gardens	Urban Background	553554	238218	NO ₂	Yes	5.1	1.5	No	2.0
UT004	YHA	Kerbside	553598	238595	NO ₂	Yes	0.8	0.4	No	2.0
UT005	Thaxted Road	Kerbside	554336	238454	NO ₂	Yes	2.4	0.5	No	2.0
UT006	Stansted, Norman Ct	Urban Background	551358	225452	NO ₂	No	0	3.9	No	2.0
UT007	Airport 2 Rose Cottage	Roadside	556186	223724	NO ₂	No	0	7.5	No	2.0
UT008	Hallingbury	Roadside	551189	217438	NO ₂	No	69	20	No	2.0
UT009	Burton End	Roadside	552403	223965	NO ₂	No	17	27	No	2.0
UT010	Newport	Kerbside	551246	233649	NO ₂	No	40	0.1	No	2.0
UT011	33 High Street	Urban Centre	553697	238452	NO ₂	Yes	0	2.7	No	2.0
UT012	Town Hall	Urban Background	553879	238510	NO ₂	Yes	20	0.1	No	2.0
UT013/ 014 / 027	Fire Station Co-located	Roadside	553825	238409	NO ₂	Yes	25	4.1	Yes	2.0
UT024	Takeley Hill	Rural	554671	221010	NO ₂	No	N/A	118	No	2.0
UT025	Elman's Green	Rural	553271	221072	NO ₂	No	N/A	271	No	2.0
UT026	South Gate	Rural	553141	218694	NO ₂	No	N/A	139	No	2.0
UT028	London Rd	Roadside	553755	238092	NO ₂	Yes	0.8	2	No	2.0

Uttlesford District Council

UT029	Debden Road	Roadside	553770	238076	NO ₂	Yes	0.5	0.5	No	2.0
UT030	Friends School	Kerbside	553875	237764	NO ₂	Yes	10	0.5	No	2.0
UT031	Mount Pleasant Road	Roadside	554178	237767	NO ₂	Yes	2	1.5	No	2.0
UT032	Borough Lane	Roadside	553625	237856	NO ₂	Yes	0	7	No	2.0
UT033	Chapel Hill	Roadside	551377	224913	NO ₂	No	0	3	No	2.0
UT034	Four Ashes	Roadside	556101	221243	NO ₂	No	8	1.5	No	2.0
UT036	Church Street	Urban Centre	553718	238530	NO ₂	Yes	0	1	No	2.0
UT037	Castle Street	Kerbside	553923	238770	NO ₂	Yes	1	1	No	2.0
UT038	Oak Cottage Hatfield Broad Oak	Kerbside	554691	216558	NO ₂	No	0	1	No	2.0

Notes:

- (1) 0m if the monitoring site is at a location of exposure (e.g. installed on/adjacent to the façade of a residential property).
- (2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Address	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾					
						2011	2012	2013	2014	2015	2016
UTT1	Saffron Walden Fire Station	Roadside	Automatic	91.26	91.26	22.30	22.90	23.70	22.90	22.13	25.66
UTT2	Takeley	Roadside	Automatic	68.51	68.51	19.60	19.00	18.80	17.80	15.93	17.50
UTT3	Mobile Station, London Road	Roadside	Automatic	97.97	49.25	N/A	N/A	N/A	N/A	N/A	23.95
UT001	High Street	Roadside	Diffusion Tube	91.67	91.67	36.65	36.13	38.94	33.06	36.35	40.04
UT002	Airport 1 Thatched Cottage	Roadside	Diffusion Tube	91.67	91.67	N/A	24.63	23.82	20.69	21.41	26.69
UT003	Gibson Gardens	Urban Background	Diffusion Tube	83.33	83.33	14.08	13.51	16.04	13.66	12.26	16.22
UT004	YHA	Kerbside	Diffusion Tube	100.00	100.00	38.36	42.57	42.74	37.34	42.17	46.90
UT005	Thaxted Road	Kerbside	Diffusion Tube	100.00	100.00	43.08	41.12	36.24	38.59	41.17	47.52
UT006	Stansted, Norman Ct	Urban Background	Diffusion Tube	100.00	100.00	15.28	14.57	15.94	15.06	14.13	16.68
UT007	Airport 2 Rose Cottage	Roadside	Diffusion Tube	100.00	100.00	21.23	21.34	24.84	19.99	22.69	27.08
UT008	Hallingbury	Roadside	Diffusion Tube	91.67	91.67	26.89	25.52	29.71	26.22	25.15	29.88
UT009	Burton End	Roadside	Diffusion Tube	100.00	100.00	36.85	36.05	38.73	33.61	35.51	43.04
UT010	Newport	Kerbside	Diffusion Tube	100.00	100.00	25.37	25.06	25.96	23.80	25.10	31.02
UT011	33 High Street	Roadside	Diffusion Tube	100.00	100.00	30.71	31.00	34.35	30.63	32.90	38.57
UT012	Town Hall	Urban Background	Diffusion Tube	83.33	83.33	18.23	19.46	20.99	19.01	18.52	20.48
UT013/014/027	Fire Station Co-located	Roadside	Diffusion Tube	100.00	100.00	21.26	20.41	23.77	22.1	21.44	25.84
UT024	Takeley Hill	Rural	Diffusion Tube	75.00	75.00	13.61	20.63	15.73	13.49	14.73	17.01
UT025	Elman's Green	Rural	Diffusion Tube	100.00	100.00	13.85	13.39	15.80	13.62	13.55	17.84
UT026	South Gate	Rural	Diffusion Tube	100.00	100.00	12.62	12.16	13.28	11.86	12.29	13.52
UT028	London Rd	Roadside	Diffusion Tube	100.00	100.00	40.73	41.42	41.33	35.01	37.96	44.76
UT029	Debden Road	Roadside	Diffusion Tube	91.67	91.67	23.04	27.11	26.51	25.04	21.58	26.50
UT030	Friends School	Kerbside	Diffusion Tube	91.67	91.67	25.28	24.36	29.75	27.16	29.01	35.27
UT031	Peaslands Rd	Roadside	Diffusion Tube	91.67	91.67	N/A	19.78	23.79	22.03	22.00	26.22

Uttlesford District Council

Site ID	Site Address	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾					
						2011	2012	2013	2014	2015	2016
UT032	Borough Lane	Roadside	Diffusion Tube	100.00	100.00	N/A	18.42	19.51	16.92	16.79	19.71
UT033	Chapel Hill	Roadside	Diffusion Tube	100.00	100.00	N/A	25.72	29.79	26.91	27.61	36.18
UT034	Four Ashes	Roadside	Diffusion Tube	100.00	100.00	N/A	N/A	N/A	26.41	26.08	35.15
UT036	Church Street	Kerbside	Diffusion Tube	100.00	100.00	N/A	N/A	N/A	22.24	21.63	27.09
UT037	Castle Street	Kerbside	Diffusion Tube	100.00	100.00	N/A	N/A	N/A	25.73	24.19	29.08
UT038	Oak Cottage Hatfield Broad Oak	Kerbside	Diffusion Tube	91.67	91.67	N/A	N/A	N/A	N/A	21.25	25.80

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

Historic data has not been distance corrected for relevant exposure. 2016 data has been distance corrected and can be found in Table B.1 in Appendix B.

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

UTT3 Mobile has taken up a new monitoring location in London Road, Saffron Walden after moving from Birchanger

Figure A.1 – Trends in Annual Mean NO₂ Concentrations at Automatic Monitoring Stations

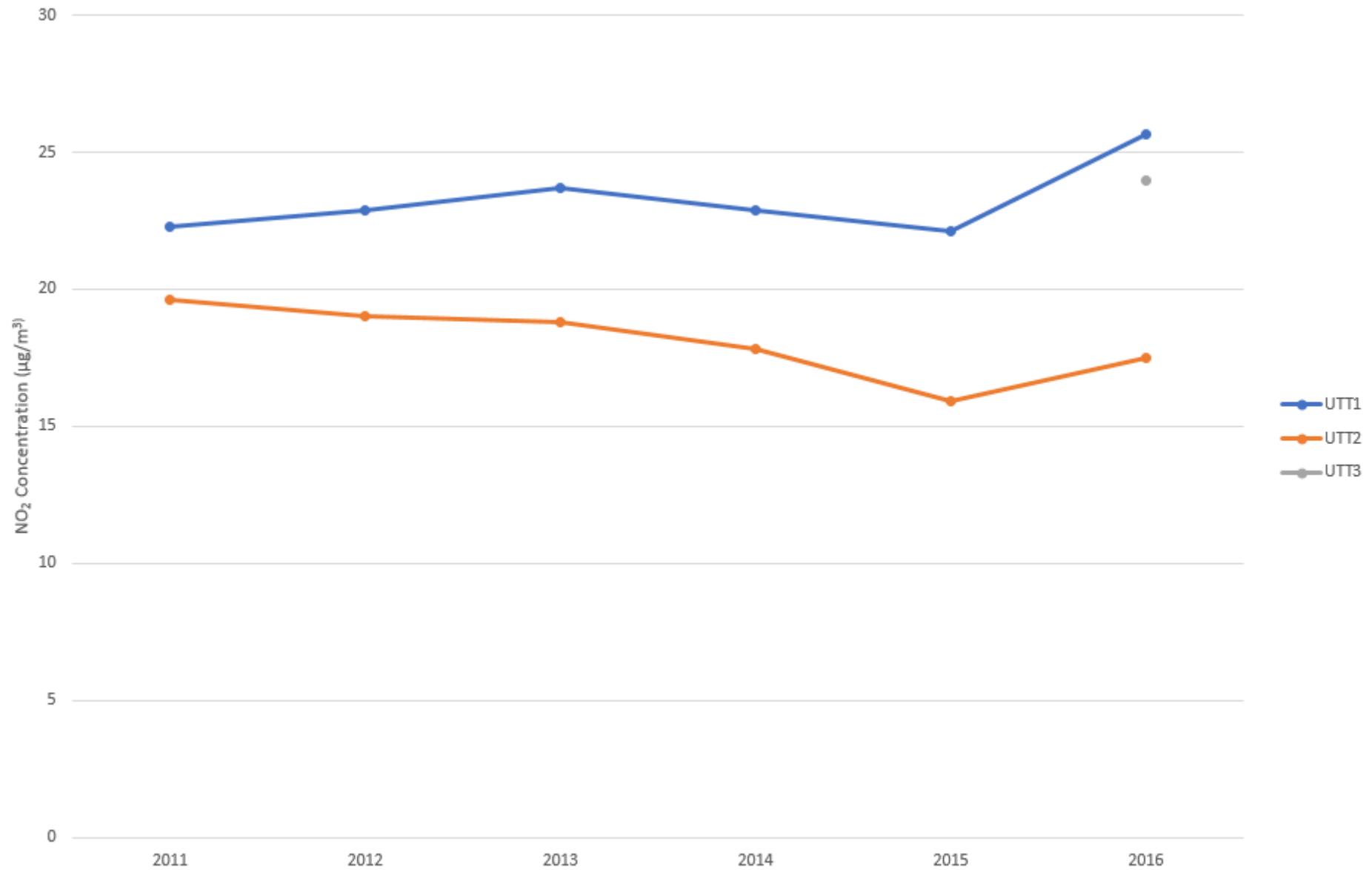


Figure A.2 – Trends in Annual Mean NO₂ Concentrations at 2016 Exceedance Sites

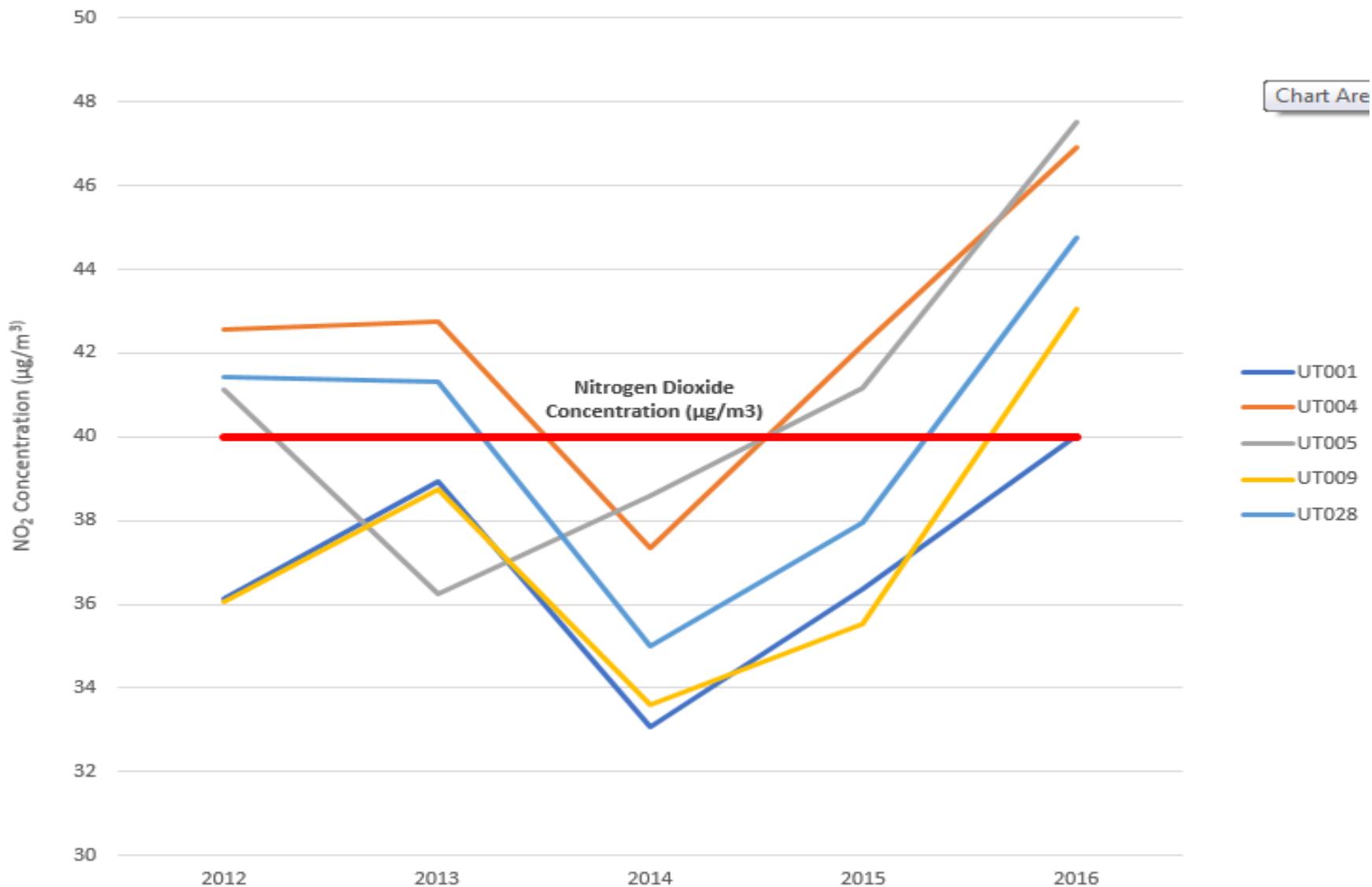


Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾					
					2011	2012	2013	2014	2015	2016
UTT1	Roadside	Automatic	91.26	91.26	0	0	0	0	0 (78.91)	1
UTT2	Roadside	Automatic	68.51	68.51	0	0	0	0	0 (70.2)	0 (97.78)
UTT3	Roadside	Automatic	97.97	49.25	N/A	N/A	N/A	0	0 (103.2)	0 (133.57)

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 99.8th percentile of 1-hour means is provided in brackets.

UTT3 Mobile has taken up a new monitoring location in London Road, Saffron Walden after moving from Birchanger

Table A.5 – Annual Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾					
				2011	2012	2013	2014	2015	2016
UTT2	Roadside	91.84	91.84	N/A	N/A	21.00	26.80	20.63	20.32
UTT3	Roadside	91.94	46.22	N/A	N/A	N/A	N/A	N/A	24.50

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

UTT3 Mobile has taken up a new monitoring location in London Road, Saffron Walden after moving from Birchanger

Figure A.3 – Trends in Annual Mean PM₁₀ Concentrations

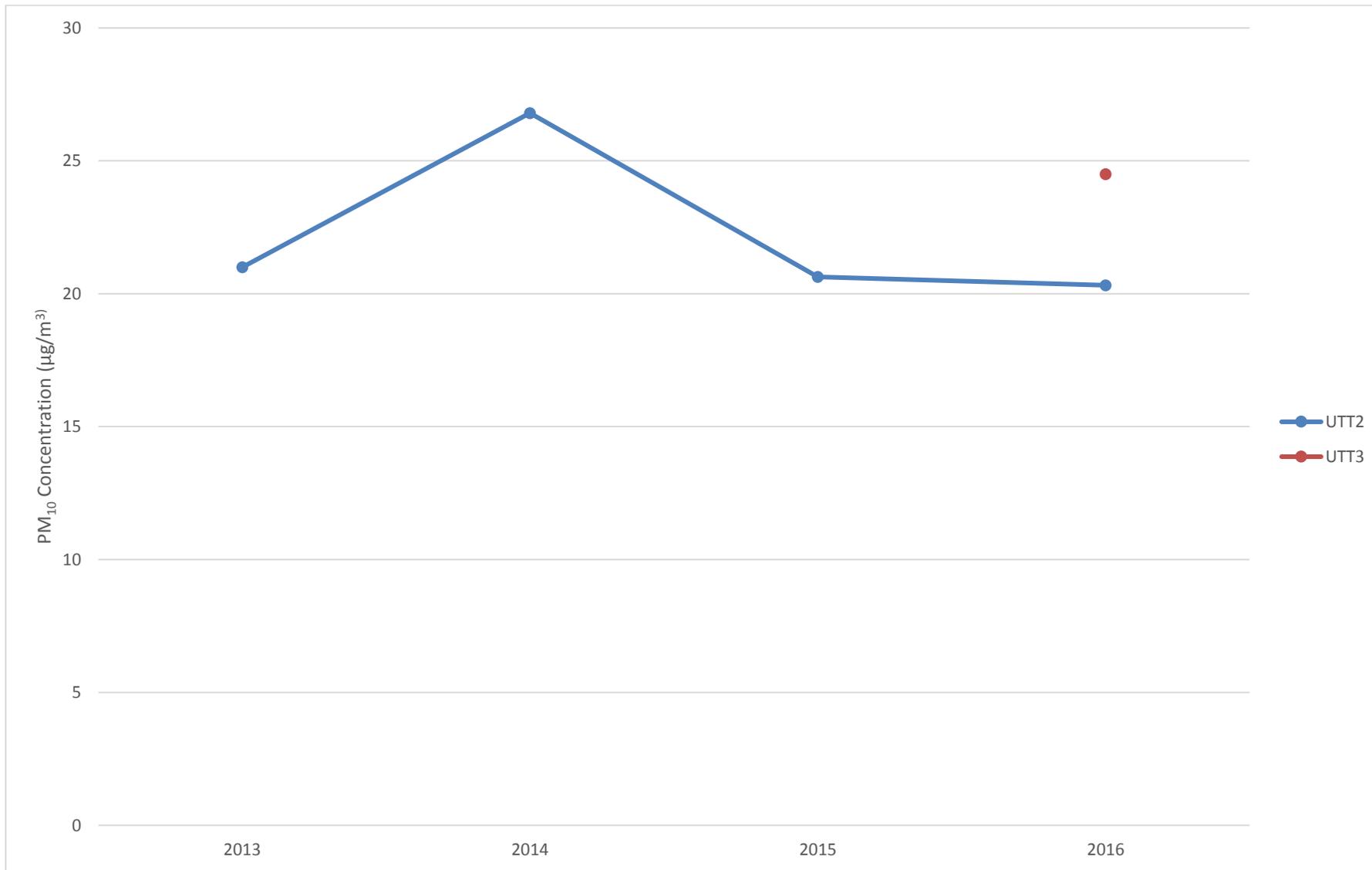


Table A.6 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾					
				2011	2012	2013	2014	2015	2016
UTT2	Roadside	91.84	91.84	N/A	N/A	0	0	2	0
UTT3	Roadside	91.94	46.22	N/A	N/A	N/A	N/A	N/A	6 (43.47)

Notes: Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

(1) data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) If the period of valid data is less than 85%, the 90.4th percentile of 24-hour means is provided in brackets.

Table A.7 – PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾					
				2011	2012	2013	2014	2015	2016
UTT1	Roadside	91.40	91.40	N/A	N/A	N/A	19.6	19.3	17.27

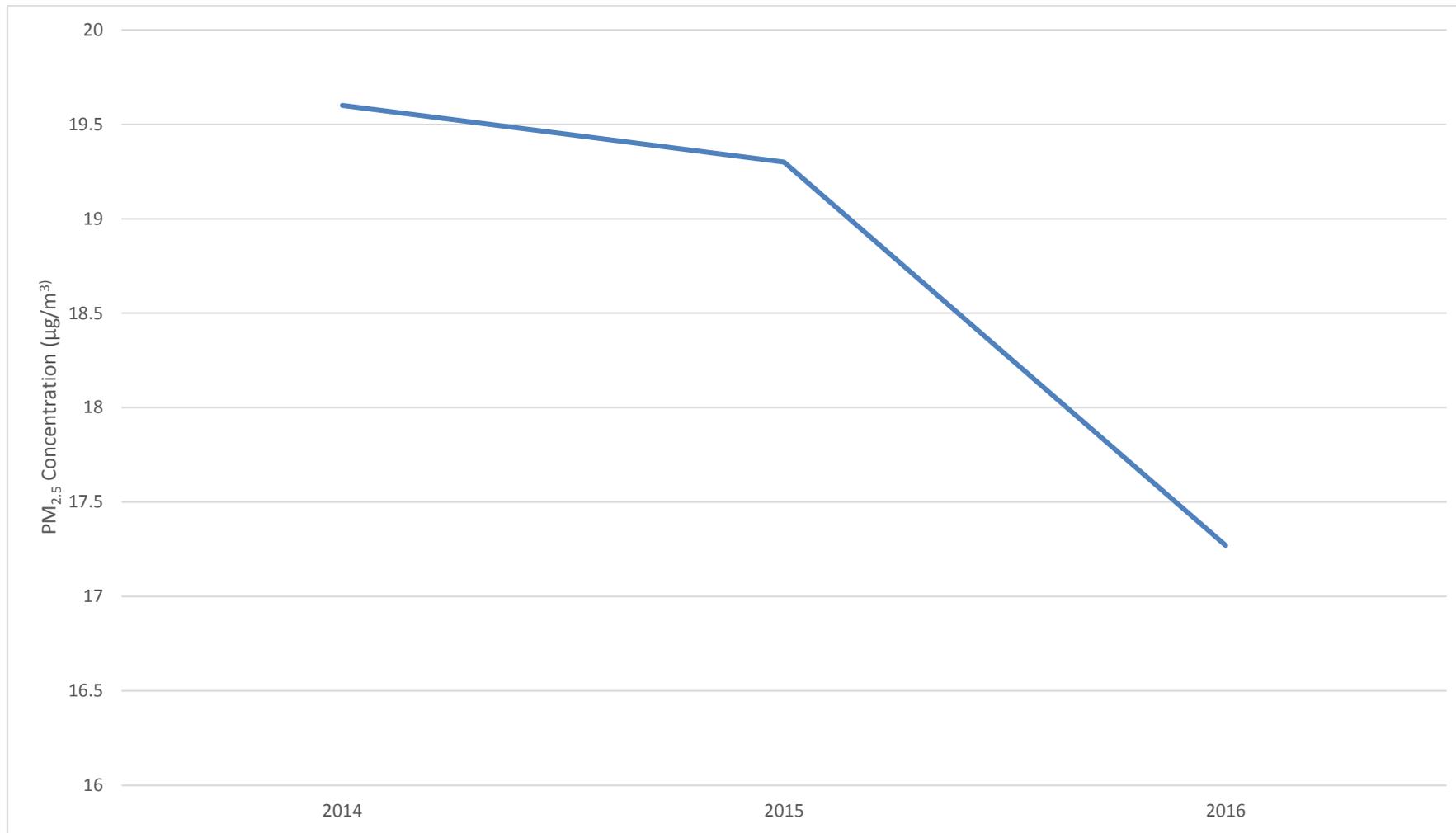
Notes:

(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(2) Data capture for the full calendar year (e.g. if monitoring was carried out for 6 months, the maximum data capture for the full calendar year is 50%).

(3) All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16, valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.4 – Trends in Annual Mean PM_{2.5} Concentrations at UTT1



Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2016

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.94) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
UT001	45.40	51.90	40.40	42.1	36.90	40.00	39.90	34.50	49.10	37.40	48.30	45.30	42.60	40.04	27.73
UT002	30.50	30.50	35.00	26.70	25.30	25.90	20.90	20.10	28.10	25.60	34.30	37.80	28.39	26.69	26.33
UT003	24.00	22.70	21.20	15.10	14.30	9.00	9.40	10.90	14.40	15.20	21.00	29.80	17.25	16.22	16.36
UT004	57.60	58.00	50.50	37.30	47.10	44.60	47.20	43.00	Missing	42.30	58.70	62.50	49.89	46.90	41.24
UT005	50.70	56.20	55.20	44.10	49.20	42.90	46.60	42.60	49.00	52.20	60.80	57.10	50.55	47.52	37.92
UT006	20.70	20.30	18.70	15.60	15.10	12.00	10.80	9.70	18.50	15.00	23.20	33.30	17.74	16.68	16.68
UT007	26.10	30.70	30.50	28.00	24.70	22.30	24.00	24.30	29.30	24.30	36.60	44.90	28.81	27.08	27.08
UT008	33.50	37.20	29.80	32.20	32.40	29.00	18.40	22.80	33.20	31.90	34.00	47.00	31.78	29.88	19.83
UT009	47.70	55.60	50.20	47.20	43.20	39.30	39.70	34.80	45.60	42.30	44.30	59.60	45.79	43.04	35.31
UT010	45.90	41.40	32.70	34.60	29.00	25.10	26.70	22.60	36.50	21.70	36.14	43.70	33.00	31.02	19.16
UT011	42.30	44.90	42.90	44.40	39.20	36.10	Cap Split	34.10	42.20	33.80	44.70	46.80	41.04	38.57	38.57
UT012	34.30	26.30	25.60	18.50	18.80	14.80	14.80	13.60	19.10	18.40	24.30	32.90	21.78	20.48	17.68
UT013	34.90	35.70	33.50	27.20	24.00	20.20	20.00	18.50	25.90	24.40	32.80	42.50	28.30	26.60	21.11
UT014	30.50	35.30	32.50	27.20	23.40	20.20	19.40	17.90	24.90	22.50	34.40	44.80	27.75	26.09	20.88
UT024	19.40	24.00	22.00	15.20	15.60	12.30	9.30	11.60	16.90	Missing	21.60	31.20	18.10	17.01	17.01

Uttlesford District Council

UT025	19.60	24.50	22.10	15.00	17.80	18.80	11.20	11.50	16.60	17.80	22.60	30.30	18.98	17.84	17.84
UT026	24.20	19.60	14.50	12.20	12.10	9.50	11.10	9.40	16.20	Damaged	14.10	15.30	14.38	13.52	13.52
UT027	33.60	32.90	31.00	24.60	24.40	19.00	19.40	17.30	24.50	23.50	27.00	39.80	26.42	24.83	20.32
UT028	49.30	50.80	54.30	43.70	Cap Split	38.60	39.30	36.80	47.30	41.00	59.90	62.80	47.62	44.76	42.55
UT029	35.00	32.30	32.40	24.00	23.40	21.10	23.50	20.90	28.20	24.80	36.80	35.90	28.19	26.50	25.29
UT030	37.70	37.50	41.70	37.80	38.00	Missing	23.30	24.90	37.50	36.70	45.20	52.40	37.52	35.27	25.24
UT031	29.70	31.90	29.60	23.70	26.20	22.10	19.50	18.80	28.60	25.10	35.00	44.50	27.89	26.22	24.44
UT032	27.60	21.50	25.60	18.80	14.90	14.30	10.60	13.90	20.20	20.10	28.90	35.20	20.97	19.71	19.71
UT033	36.00	36.70	48.50	36.30	Missing	34.50	Missing	32.40	33.80	37.30	41.10	48.30	38.49	36.18	36.18
UT034	44.00	40.20	42.30	39.00	36.60	30.50	29.00	30.30	37.80	36.00	44.60	52.70	37.39	35.15	27.65
UT036	33.30	33.20	33.30	25.60	25.30	19.90	22.00	20.20	31.70	22.80	36.50	39.70	28.82	27.09	27.09
UT037	38.00	35.80	33.60	28.40	29.00	21.70	21.80	21.70	32.40	26.80	34.20	48.70	30.93	29.08	27.34
UT038	25.90	37.40	31.10	24.40	26.20	21.70	20.90	19.50	25.30	24.80	32.50	41.70	27.45	25.80	25.80

Local bias adjustment factor used

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

(1) See Appendix C for details on bias adjustment and annualisation.

(2) Distance corrected to nearest relevant public exposure.

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

Uttlesford District Council operates three automatic monitoring stations and monitors for NO₂, PM₁₀ and PM_{2.5}.

The monitoring assets consist of three chemiluminescence (NO/NO₂/NO_x) gas analysers, two Met One BAM PM₁₀ analysers and one Met One Smart Heated BAM PM_{2.5} analyser.

Analysers are serviced in-line with manufacturer guidelines biannually. NO₂ analysers have a LSO calibration fortnightly to check against a certified calibration gas bottle.

Data has been ratified according to LAQM TG16 procedures to identify erroneous data and to account for instrument drift.

For Nitrogen Dioxide, the calibration and ratification process corrected the raw dataset for any drift in the zero baseline and upper range of the instrument. This was carried out using a Enviman Reporter software based process that incorporates zero and span check information from the calibration visits.

The Met One PM₁₀ measurements are corrected for slope by dividing the data by 1.2.

The Met One PM_{2.5} measurements are not adjusted due to the presence of the smart heated.

Diffusion Tubes QA/QC

Uttlesford District Council undertook monitoring at 28 nitrogen dioxide diffusion tubes sites in 2016.

The diffusion tubes were supplied by Environmental Scientifics Group (ESG Didcot) (UKAS Testing Laboratory number 1015) with a preparation method of 50% triethanolamine (TEA) in Acetone.

The AIR NO₂ proficiency testing scheme found that the laboratory achieved the following percentage of results determined as satisfactory for 2016:

Table C.1 – AIR PT Results 2016

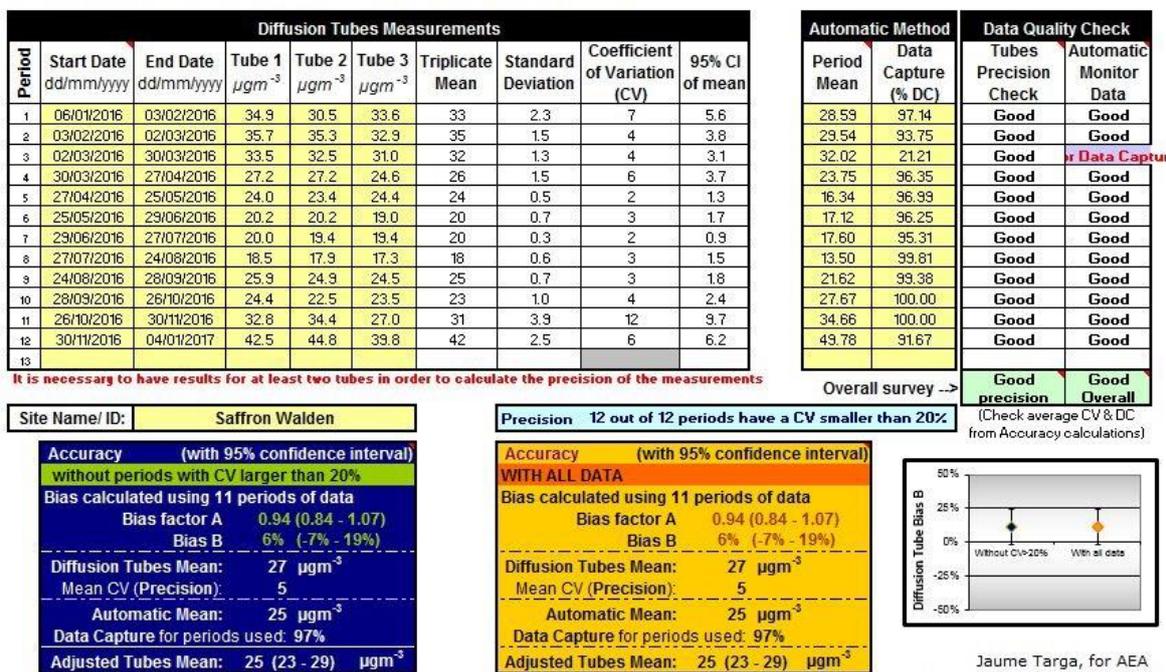
AIR PT Round	AIR PT AR006	AIR PT AR007	AIR PT AR009	AIR PT AR010
Round conducted in the period	January – February 2016	April – May 2016	July – August 2016	September – October 2016
ESG Didcot	100%	75%	75%	100%

Diffusion tube Bias Adjustment Factors

Uttlesford District Council uses a locally calculated bias adjustment figure produced at the Saffron Walden automatic analyser UTT1 for calculating diffusion tube results. For 2016 the locally calculated bias adjustment figure was 0.94.

Figure C.1 Local Bias Adjustment Calculation

Checking Precision and Accuracy of Triplicate Tubes



Annualisation Techniques

Where the valid data capture rate is below the appropriate threshold, data has been annualised according to LAQM TG16 procedures in order to estimate an annual average from a part year average.

Table C.2 - UTT2 NO₂ Annualisation

Background Site	Annual Mean 2016 (Am)	Period Mean 2015 (Pm)	Ratio (Am/Pm)
Chignal	14.24	14.41	0.9879
St Osyth	13.10	13.48	0.9721
Average (Ra)			0.9800
UTT2 Monitored Average			17.86
UTT2 Annualised Average Concentration			17.50

Table C.3 - UTT3 NO₂ Annualisation

Background Site	Annual Mean 2016 (Am)	Period Mean 2015 (Pm)	Ratio (Am/Pm)
Chignal	14.24	14.96	0.9518
St Osyth	13.10	13.37	0.9801
Average (Ra)			0.9660
UTT3 Monitored Average			24.79
UTT3 Annualised Average Concentration			23.95

Table C.4 - UTT3 PM₁₀ Annualisation

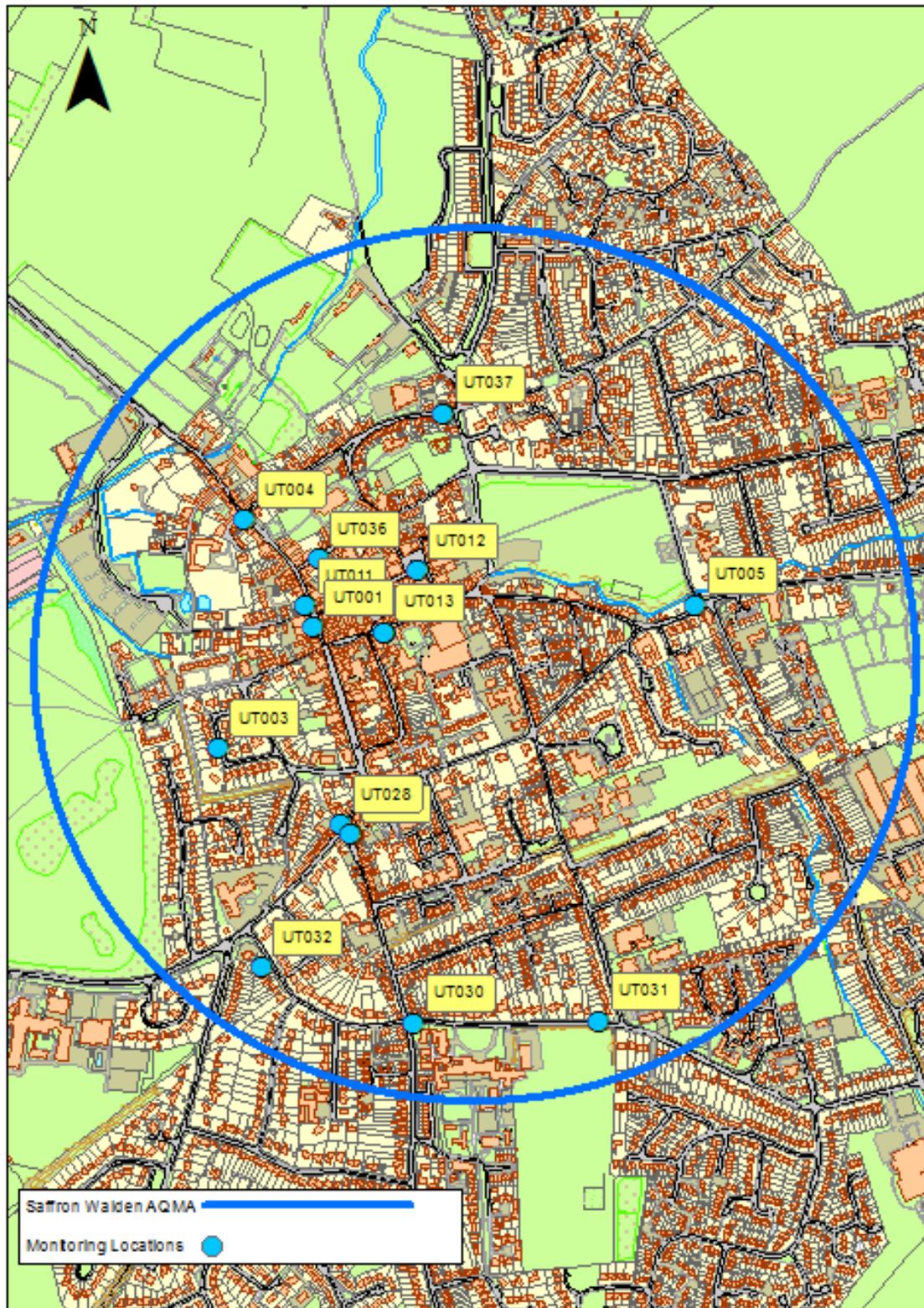
Background Site	Annual Mean 2016 (Am)	Period Mean 2015 (Pm)	Ratio (Am/Pm)
Chignal	15.79	16.16	0.9767
Rochford Stoke	15.81	15.58	1.0147
Thurrock	17.27	17.61	0.9957
Average (Ra)			0.9957
UTT3 Monitored Average			24.61
UTT3 Annualised Average Concentration			24.50

Nitrogen Dioxide Fall Off with Distance Calculator

Using the formula from the NO₂ fall off with distance calculator version 4.1, concentrations have been estimated at relevant exposure. Results are shown in Table B.1 of Appendix B.

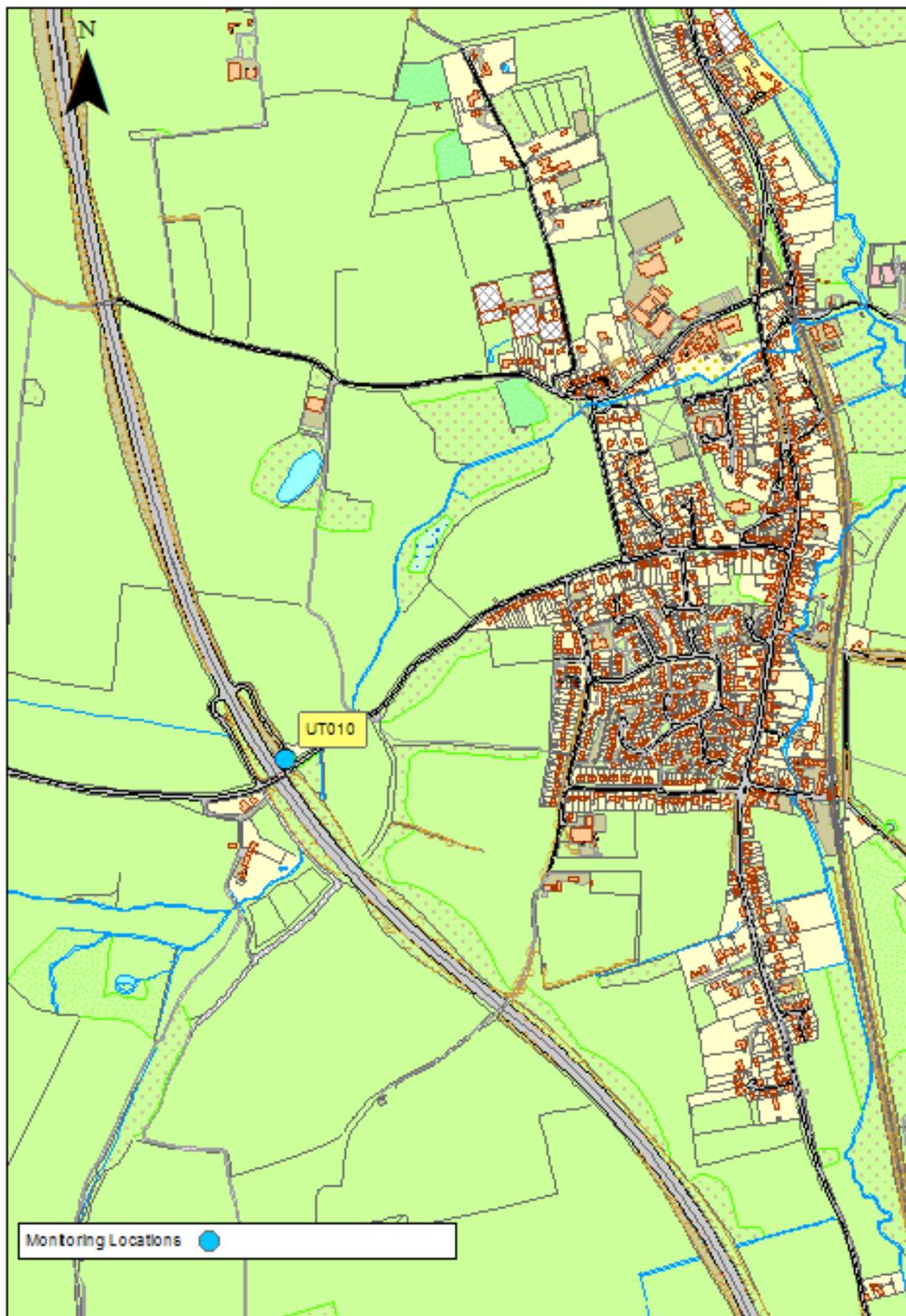
Appendix D: Map(s) of Monitoring Locations and AQMAs

Figure D.1 – Saffron Walden AQMA and Monitoring Locations



© Crown copyright and database rights 2017 Ordnance Survey 100023562

Figure D.2 – Newport Monitoring Location



© Crown copyright and database rights 2017 Ordnance Survey 100023562

Figure D.3 – Other Monitoring Locations



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

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

² The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

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
Defra	Department for Environment, Food and Rural Affairs
LAQM	Local Air Quality Management
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Airborne particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
TEA	Triethanolamine – substance used in diffusion tubes for absorbing nitrogen dioxide
UKAS	United Kingdom Accreditation Service

References

AQMAs Declared by Uttlesford District Council available at; https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=289

Defra LAQM Summary of Laboratory Performance in AIR NO₂ PT Scheme available at; [http://laqm.defra.gov.uk/documents/LAQM-AIR-PT-Rounds-1-12-\(April-2014-February-2016\)-NO2-report.pdf](http://laqm.defra.gov.uk/documents/LAQM-AIR-PT-Rounds-1-12-(April-2014-February-2016)-NO2-report.pdf)

Defra LAQM Policy Guidance LAQM.PG16 available at; <http://laqm.defra.gov.uk/documents/LAQM-PG16-April-16-v1.pdf>

Defra LAQM Technical Guidance LAQM.TG16 available at; <http://laqm.defra.gov.uk/documents/LAQM-TG16-April-16-v1.pdf>

Defra Nitrogen Dioxide Fall-Off with Distance Calculator available at; <http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html>

Essex Air Quality Consortium available at; <http://www.essexair.org.uk>

EssexCarShare.com available at; <https://essex.liftshare.com/>

Essex Air Twitter Feed available at; <https://twitter.com/essexair>

Essex County Council Local Transport Plan available at; <http://www.essexhighways.org/Transport-and-Roads/Highway-Schemes-and-Developments/Local-Transport-Plan.aspx>

Public Health Outcomes Framework Indicator 3.01 available at; <http://www.phoutcomes.info/>

Uttlesford District Council Draft Action Plan available at; <http://www.uttlesford.gov.uk/aqconsultation>

Uttlesford District Council Local Plan available at; <http://www.uttlesford.gov.uk/localplan>