Uttlesford District Council

2015 LAQM Updating and Screening Assessment

May 2015

Amec Foster Wheeler Environment
& Infrastructure UK Limited

Report for

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Document revisions

No.	Details	Date
1	Draft Report	06/05/15
2	Final	08/05/15
3	Final v2	27/05/15

Executive summary

Part IV of the Environment Act 1995 places a statutory duty on local authorities to review and assess the air quality within their area and take account of Government Guidance when undertaking such work. This Updating and Screening Assessment (USA) is a requirement of the Review and Assessment process and is a requirement for all local authorities. The Report has been undertaken in accordance with the Technical Guidance LAQM.TG (09) and associated tools.

This USA considers all new monitoring data and assesses the data against the Air Quality Strategy objectives. It also considers any changes that may have an impact on air quality.

The monitoring undertaken within the Council has shown that there are no exceedences of the air quality objectives for nitrogen dioxide at relevant locations.

The assessment of sources has concluded that there are no new or significantly changed sources identified that require a Detailed Assessment to be undertaken.

The next action for Uttlesford Council will be to submit a 2016 LAQM Progress Report.

Contents

1. Introduction

1.1 Description of local authority area

Uttlesford District Council (UDC) covers an area in the western part of Essex. It is a mainly rural district, with the population mainly spread between 50 hamlets and villages. The District's largest towns are Saffron Walden and Great Dunmow. Smaller towns in the District include Stansted Mountfitchet and Thaxted. The smaller settlements of Felsted, Takeley and Canfield are also growing.

The main source of air pollutants in the District is from transport. The M11 and A120 run through the District and the District is also home to Stansted Airport. Nitrogen dioxide (NO_2) and particulate matter (PM_{10}) are therefore the pollutants of main concern.

1.2 Purpose of report

This report fulfils the requirements of the Local Air Quality Management (LAQM) 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 micrograms per cubic metre μgm^{-3} (milligrams per cubic metre, mgm^{-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	Concentration	Measured as	Date to be achieved by
Benzene	16.25 μgm^{-3}	Running annual mean	31.12.2003
	5.00 μgm^{-3}	Running annual mean	31.12.2010
1,3-Butadiene	2.25 μgm^{-3}	Running annual mean	31.12.2003
Carbon monoxide	10.0 mgm^{-3}	Running 8-hour mean	31.12.2003
Lead	0.5 μgm^{-3}	Annual mean	31.12.2004
	0.25 μgm^{-3}	Annual mean	31.12.2008
Nitrogen dioxide	200 μgm^{-3} not to be exceeded more than 18 times a year	1-hour mean	31.12.2005
	40 μgm^{-3}	Annual mean	31.12.2005
Particles (PM_{10}) (gravimetric)	50 μgm^{-3}, not to be exceeded more than 35 times a year	24-hour mean	31.12.2004
	40 μgm^{-3}	Annual mean	31.12.2004
Sulphur dioxide	350 μgm^{-3}, not to be exceeded more than 24 times a year	1-hour mean	31.12.2004
	125 μgm^{-3}, not to be exceeded more than 3 times a year	24-hour mean	31.12.2004
	266 μgm^{-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

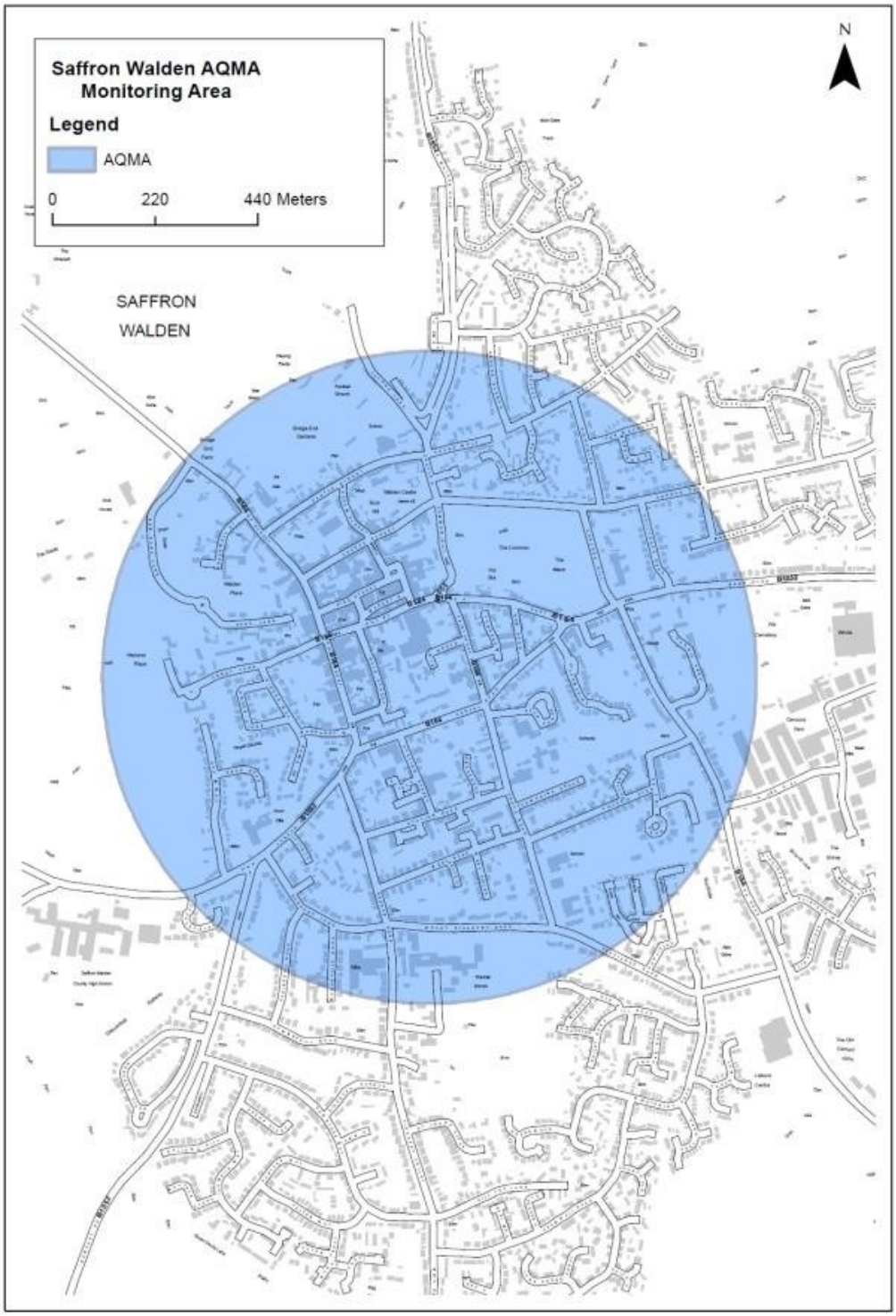
Table 1.2 Outcomes from previous review and assessments

Title	Date	Outcome
First Round of Review and Assessment	1998 – 2002	Reports concluded that the AQOs would be achieved for all pollutants and there were no AQMAs declared. The M11 and A120 were the main sources of emissions of NO_2 and PM_{10}.
Updating and Screening Assessment 2003	2003	The USA concluded that the AQOs would be achieved for all pollutants and there were no AQMAs declared.
Progress Report 2004	2004	The Progress Report confirmed the findings of the USA that the AQOs would be achieved for all pollutants and there were no AQMAs declared.
Progress Report 2004	2005	The Progress Report confirmed the findings of the previous report that the AQOs would be achieved for all pollutants and there were no AQMAs declared.
Updating and Screening Assessment 2006	2006	The USA concluded that the annual mean NO_2 AQO would be exceeded at three junctions in Saffron Walden and a Detailed Assessment would be required.
2007 Detailed Assessment	2007	The Detailed Assessment confirmed the findings of the USA and three AQMAs were declared for the three junctions for annual mean NO_2 exceedences.

Table 1.2 (continued) Outcomes from previous review and assessments

Title	Date	Outcome
Progress Report 2008	2008	The Progress Report for 2008 concluded that the AQOs for all pollutants would be met outside of the newly declared AQMAs.
Updating and Screening Assessment 2009	2009	The USA concluded that the AQOs for all pollutants would be met outside of the newly declared AQMAs.
Progress Report 2010	2010	The Progress Report concluded that exceedences of annual mean NO_2 AQO had occurred at five monitoring locations in 2009. Two locations (Debden Road and Burton End) were located outside of the AQMAs. Additional monitoring was undertaken to confirm the extent of the exceedences outside the AQMAs.
Progress Report 2011	2011	The Progress Report concluded that AQOs would be met for all pollutants outside of the AQMAs except at the location of the additional tubes on Debden Road and Burton End. The additional tubes had confirmed that there were exceedences of the annual mean NO_2 AQO and a Detailed Assessment was recommended to be undertaken for London Road / Burton End.
Updating and Screening Assessment 2012	2012	The USA for Uttlesford District Council concluded that a Detailed Assessment or any additional monitoring is not required for any pollutant. Exceedences of the annual mean Nitrogen Dioxide Air Quality Objectives occurred at two non-automatic monitoring sites within the District but both of these sites are located within an existing AQMA. The monitoring undertaken within the District has shown that there were no other exceedences of the Air Quality Objectives.
Progress Report 2013	2013	The Progress Report identified three exceedences of the annual mean Nitrogen Dioxide Air Quality Objectives. These were located within the AQMA. Further monitoring undertaken within the District has shown that there were no other exceedences of Air Quality Objectives.
Progress Report 2014	2014	Automatic monitoring identified no exceedences of the nitrogen dioxide annual mean air quality objective of 40 μgm^{-3} or 1 hour mean air quality objective of 200 μgm^{-3} not to be exceeded more than 18 times per year at locations of public exposure within the existing Saffron Walden AQMA in 2013. Non-automatic monitoring identified two exceedences of the nitrogen dioxide annual mean air quality objective of 40 μgm^{-3} in 2013. Concentrations predicted at locations of relevant exposure were within the air quality objectives although it should be noted that they were still above 36 μgm^{-3}.

Figure 1.1 AQMA



Source: Map provided by Environmental Health Officer at Uttlesford District council.

2. New monitoring data

2.1 Summary of monitoring undertaken

Automatic monitoring sites

UDC operates three automatic monitoring sites, all of which monitor NO_2 concentrations.

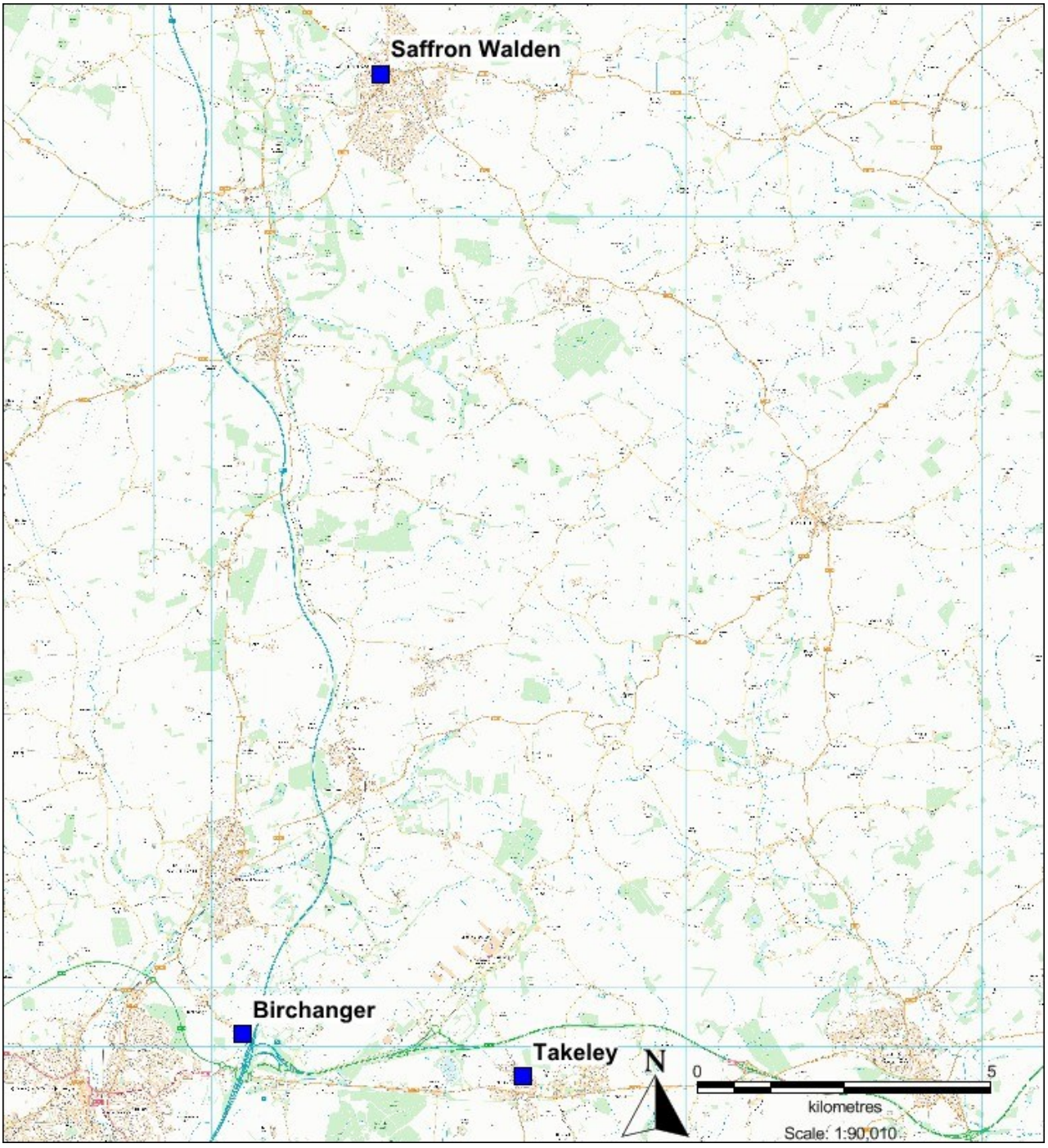
Table 2.1 Automatic monitoring site

Site ID	Site Name	X	Y	Pollutants Monitored	Distance from road to relevant exposure (m)	Distance to kerb (m)	In AQMA?
Saffron Walden	Urban Centre	553823	238408	NO_2, $PM_{2.5}$	25	5	Y
Takeley	Urban background	556234	221496	NO_2, PM_{10}, O_3	15	50	N
Birchanger	Rural	551496	222208	NO_2, PM_{10} VOC's	12	35	N

Periods of low data capture have been identified where necessary. A log of faults with the automatic monitors is provided in Appendix E.

Monitoring locations are provided in Figure 2.1.

Figure 2.1 Location of automatic monitoring sites



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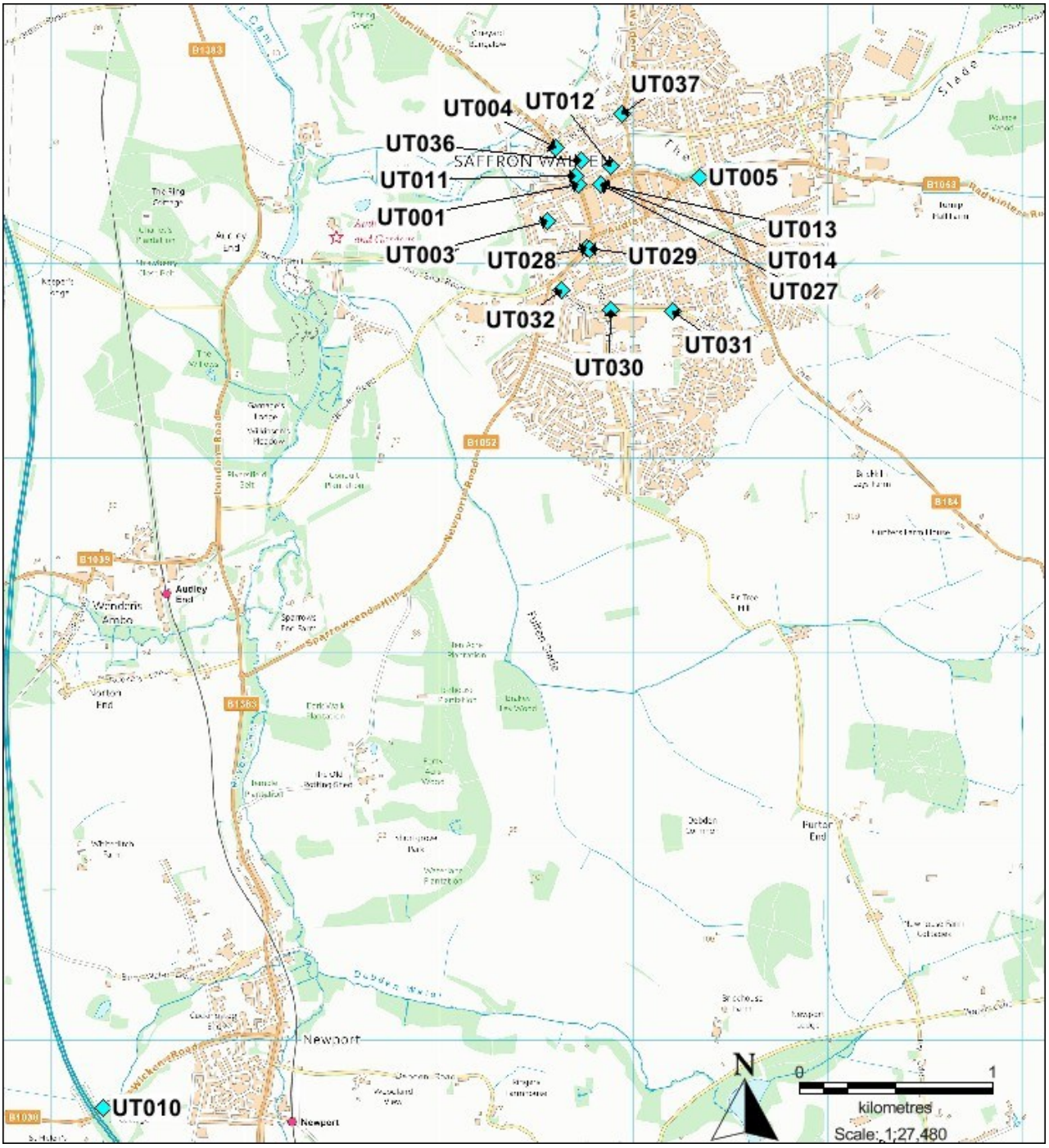
Automatic Sites

Non-automatic monitoring sites

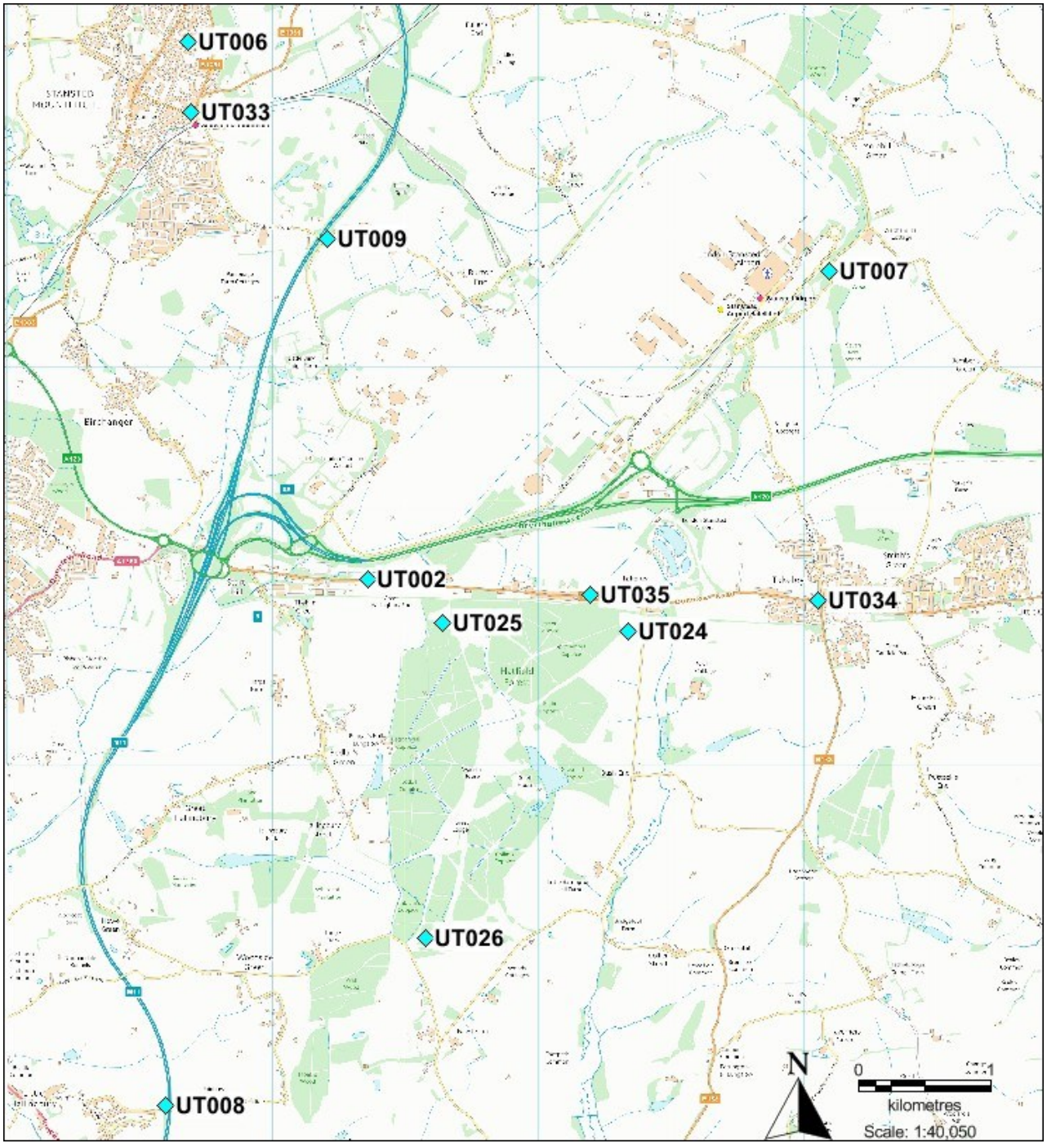
Monitoring for NO_2 is undertaken using passive diffusion tubes at twenty-seven sites throughout the District. The locations of these monitoring sites are shown in Figure 2.2 and details of these sites in Table 2.2. Annual mean concentrations for the past four years are provided in Table 2.2. Trends in annual mean concentrations since 2011 are provided in Figure 2.3.

Quality control procedures, including bias adjustment, are discussed in Appendix B.

Figure 2.2 Location of non-automatic monitoring sites
Northern sites



Southern sites



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Diffusion Tubes

Table 2.2 Non-automatic monitoring sites

Site ID	Site Name	Site Type*	X	Y	Distance from diffusion tube to relevant exposure (m)**	Distance to kerb (m)	In AQMA?
UT001	Walden 1 PO High Street	Roadside	553710	238415	15.0	1.5	Y
UT002	Airport 1 Thatched Cottage	Roadside	552706	221403	1.0	10.0	N
UT003	Walden 3 Gibson Gardens	Urban Background	553552	238219	5.1	1.5	Y
UT004	Walden 4 YHA	Roadside	553594	238599	0.8	1.4	Y
UT005	Walden 5 Thaxted Road	Kerbside	554332	238450	2.4	0.5	Y
UT006	Stansted, Norman Ct	Urban Background	551358	225452	0	3.9	N
UT007	Airport 2 Rose Cottage	Roadside	556186	223724	0	7.5	N
UT008	Hallingbury	Roadside	551189	217438	95.0	29.1	N
UT009	Burton End	Roadside	552403	223965	142.0	9.3	N
UT010	Newport	Kerbside	551255	233649	34.6	0.0	N
UT011	Walden 11 33 High Street	Roadside	553697	238452	0	2.7	Y
UT012	Walden 12 Town Hall	Urban Background	553878	238509	20.0	0.2	Y
UT013	Fire Station 1 Co-located	Roadside	553823	238408	25.0	4.1	Y
UT014	Fire Station 2 Co-located	Roadside	553823	238408	25.0	4.1	Y
UT024	Takeley Hill Hatfield Forest	Urban Background	554671	221010	196.0	117.5	N
UT025	Elman's Green Hatfield Forest	Urban Background	553271	221072	265.0	183.1	N
UT026	South Gate Hatfield Forest	Urban Background	553141	218694	763.0	138.0	N
UT027	Fire Station 3 Co-located	Roadside	553823	238408	25.0	4.1	Y
UT028	Walden 16 London Road	Roadside	553751	238086	0.8	2.0	Y
UT029	Walden 17 Debden Road	Roadside	553770	238076	0.8	2.0	Y

Table 2.2 (continued) Non-automatic monitoring sites

Site ID	Site Name	Site Type*	X	Y	Distance from diffusion tube to relevant exposure (m)**	Distance to kerb (m)	In AQMA?
UT030	Walden 18 Friends School	Kerbside [a]	553875	237763	15.0	0.5	Y
UT031	Walden Peaslands Rd	Roadside	554193	237756	2.0	1.5	Y
UT032	Walden Borough Lane	Urban Background	553619	237869	0	7.0	Y
UT033	Stansted Chapel Hill	Roadside	551377	224913	0	1.5	N
UT034	Four Ashes	Roadside	556101	221243	10.0	1.5	N
UT035	Takeley Street	Roadside	554390	221279	9.0	1.5	N
UT036	Church Street	Roadside	553720	238532	0	1.0	Y
UT037	Walden Castle Street	Roadside	553921	238774	1.0	1.0	Y

- Data not available
* Site types were estimated using LAQM.TG(09).
** Distances from diffusion tube to relevant exposure were estimated using http://www.gridreferencefinder.com/#
[a] Diffusion tube UT030 was moved to a kerbside location during 2014 due to new street furniture.

2.2 Comparison of monitoring results with AQ objectives

Nitrogen Dioxide

Automatic monitoring data

All three automatic monitors in Uttlesford monitored NO_2 concentrations in 2014. The results are shown in Table 2.3.

Table 2.3 Automatic NO_2 monitoring results in Uttlesford 2011 - 2014

Site ID	2011	2012	2013	2014	2014 Data Capture
Saffron Walden	22.3 (0)	22.9 (0)	23.7 (0)	22.9 (0)	95 %
Takeley	19.6 (0)	19.0 (0)	18.8 (0)	17.8* (0)	45 %
Birchanger	-	-	-	15.3 (0)	78 %

Concentrations were converted from ppb to μgm^{-3} using Box A1.5 "Conversion Factors for Gaseous Pollutants at 20ºC and 101.3 kPa" in LAQM TG.09 (Defra, 2009)
Exceedences of hourly mean AQO shown in ( ).
*Data capture was only 45% for Takeley station in 2014 so data shown is annualised.

Diffusion tube monitoring data

The 2011-2014 annual mean NO_2 concentrations recorded at the passive diffusion tube sites in the District are shown in Table 2.4. Data capture for some sites were below the recommended 75%, therefore annualisation was undertaken, in accordance with the guidance in Box 3.2 of LAQM.TG(09) (Defra, 2009).

Table 2.4 Results of 2011 - 2014 NO_2 diffusion tubes

Site ID	Site Name	2011 (Bias adjustment factor = 0.80)	2012 (Bias adjustment factor = 0.90)	2013 (Bias adjustment factor = 0.97)	2014 (Bias adjustment factor = 0.87)	2014 Data Capture (%)
UT001	Walden 1 PO High Street	36.6	38.7	38.9	33.1	100.0
UT002	Airport 1 Thatched Cottage	19.8	27.3	23.8	20.7	91.7
UT003	Walden 3 Gibson Gardens	14.1	15.7	16.0	13.7	100.0
UT004	Walden 4 YHA	38.4	**47.5**	**42.7** (39.6b)	37.3 (34.9b)	91.7
UT005	Walden 5 Thaxted Road	**43.1**	**46.1**	36.2	38.6	91.7
UT006	Stansted, Norman Ct	15.3	16.3	15.9	15.1	100.0
UT007	Airport 2 Rose Cottage	21.2	23.5	24.8	20.0	100.0
UT008	Hallingbury	26.9	27.8	29.7	26.2	100.0
UT009	Burton End	36.9	38.9	38.7	33.6	100.0
UT010	Newport	25.4	27.0	26.0	23.8	100.0
UT011	Walden 11 33 High Street	30.7	33.6	34.4	30.6	100.0
UT012	Walden 12 Town Hall	18.2	21.1	21.0	19.0	100.0
UT013/014/027	Fire Station Co-located	21.2	22.7	25.0	22.1	100.0
UT024	Takeley Hill Hatfield Forest	13.6	14.5	15.7	13.5	83.3
UT025	Elman's Green Hatfield Forest	13.8	15.6	15.8	13.6	91.7
UT026	South Gate Hatfield Forest	12.6	13.7	13.3	11.9	100.0
UT028	Walden 16 London Road	**40.7**	**45.9**	**41.3** (39.3b)	35.0 (33.0b)	100.0
UT029	Walden 17 Debden Road	23	30.0	27.3	25.0	100.0
UT030	Walden 18 Friends School	25.3	26.9	30.7	27.2	75.0
UT031	Walden Peaslands Rd	-	19.8	23.8	22.0	100.0

Table 2.4 (continued) Results of 2011 - 2014 NO_2 diffusion tubes

Site ID	Site Name	2011 (Bias adjustment factor = 0.80)	2012 (Bias adjustment factor = 0.90)	2013 (Bias adjustment factor = 0.97)	2014 (Bias adjustment factor = 0.87)	2014 Data Capture (%)
UT032	Walden Borough Lane	-	20.5*	19.5	16.9	100.0
UT033	Stansted Chapel Hill	-	25.7	29.8	26.9	100.0
UT034	Four Ashes	-	-	-	27.4a	75.0
UT035	Takeley Street	-	-	-	21.2a	58.3
UT036	Church Street	-	-	-	20.8a	41.7
UT037	Walden Castle Street	-	-	-	24.1a	41.7

Exceedences of the AQO are shown in **bold**.

a Concentrations annualised due to having lower than 75% data capture.

b Adjusted with NO_2 Falloff with distance calculator for diffusion tube location.

- No data available

There were no exceedences of the AQO of 40 μgm^{-3} for NO_2 recorded in Uttlesford in 2014.

Diffusion tubes at UT004 and UT028 both showed exceedences of the AQO of 40 μgm^{-3} in 2013 and previous years, but recorded decreases in concentrations in 2014.

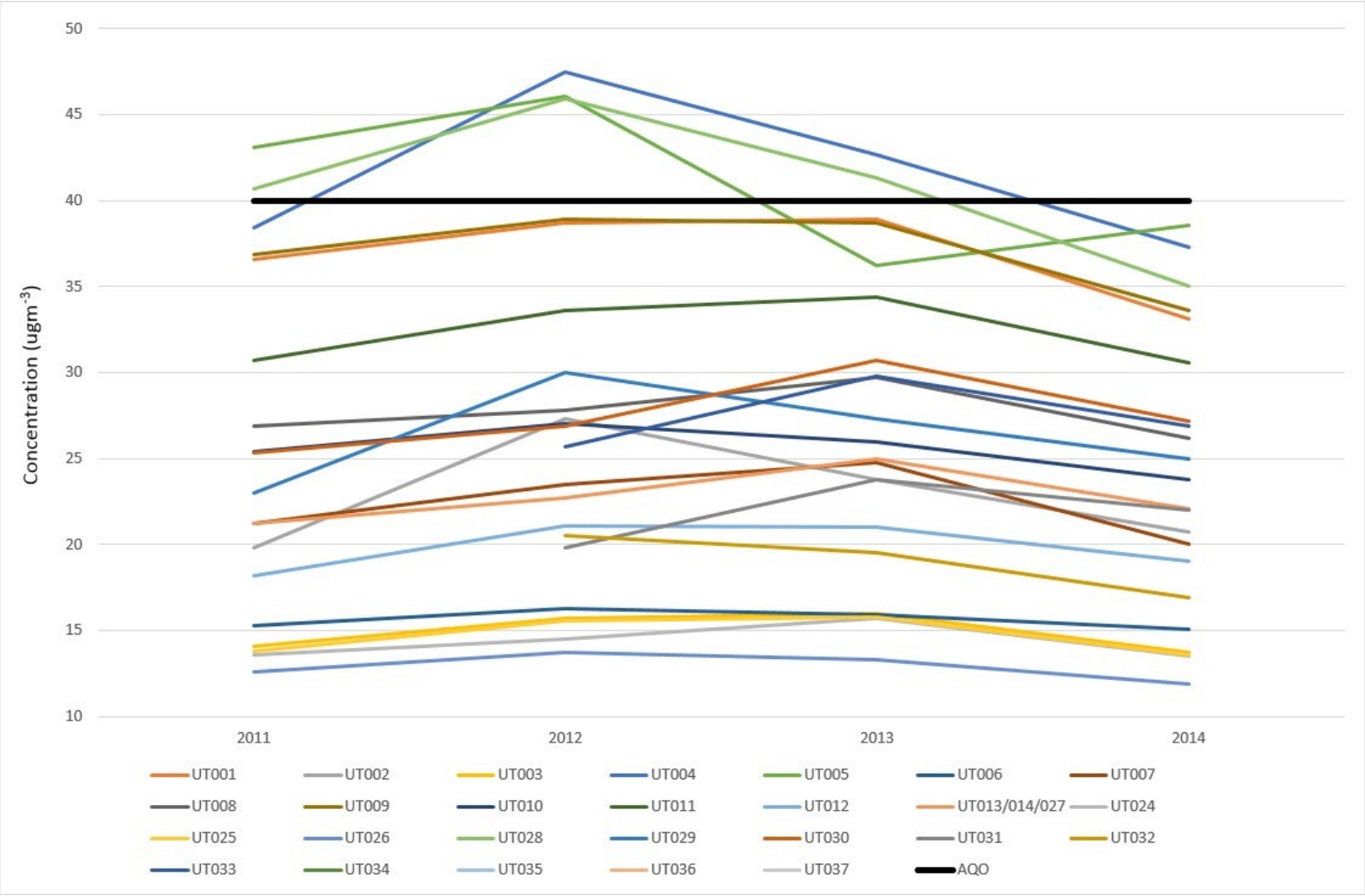
The monitoring site UT005 at Walden 5 Thaxted Road recorded the highest annual mean NO_2 concentration of 38.6 μgm^{-3} in 2014, within 10% of the AQO. This site recorded an increase in annual mean of 2.4 μgm^{-3} between 2013 and 2014. The 2014 Progress Report identified that road works were in place for 30 weeks of 2013 which set queuing traffic back around 18m from the location of the UT005 diffusion tube (Uttlesford District Council, 2014). It is believed that the AQO may have been exceeded in 2013 if the road works had not been in place. An exceedance of the AQO has not been recorded at the site since 2012.

The monitoring site UT004 at Walden 4 YHA annual mean NO_2 concentration of 38.6 μgm^{-3} in 2014, also within 10% of the AQO. When the distance was corrected to estimate the concentration at the nearest sensitive receptor location, the estimated concentration is 34.9 μgm^{-3}. This adjustment is detailed in Appendix B.

The monitoring site UT028 at Walden 16 London Road recorded annual mean concentrations exceeding the AQO in recent years. When the distance was corrected to estimate the concentrations at the nearest sensitive receptor location, the estimated concentration in 2014 is 33.0 μgm^{-3}.

Trends in annual mean NO_2 concentrations since 2011 are shown in Figure 2.2. This data indicates that concentrations have been reasonably stable in recent years, although decreases were observed at almost every location in 2014. In particular, concentrations at UT001 and UT028 showed reductions in concentrations of 5.8 μgm^{-3} and 6.3 μgm^{-3} respectively. However, an increase of 2.4 μgm^{-3} was recorded at Walden 5 Thaxted Road, which has shown exceedences of the AQO in 2011 and 2012.

Figure 2.3 Trends in NO_2 concentrations measured at diffusion tube monitoring sites



Analysis of UK continuous NO_2 monitoring data has shown that it is unlikely that the hourly mean NO_2 objective, of 18 hourly means over 200 μgm^{-3}, would be exceeded where the annual mean objective is below 60μgm^{-3} (Defra, 2009). All sites diffusion tube sites in Uttlesford have measured concentrations below the 60 μgm^{-3}, therefore, the NO_2 hourly mean AQS objective is expected to be met at all relevant locations.

PM_{10}

PM_{10} monitoring is undertaken in the Uttlesford District Council area at the Takeley and Birchanger monitors. The concentrations recorded between 2013 and 2014 are provided in Table 2.5. No exceedences of the annual mean AQO were recorded.

Table 2.5 PM_{10} monitoring results in Uttlesford 2013 - 2014

Site ID	2013	2014	2014 Data Capture (%)
Takeley	21.0* (0)	26.8 (0)	95
Birchanger	-	31.2 (0)	79

Concentrations were converted from ppb to μgm^{-3} using Box A1.5 "Conversion Factors for Gaseous Pollutants at 20ºC and 101.3 kPa" in LAQM TG.09 (Defra, 2009)
- Data not available
Exceedences of hourly mean AQO shown in ( ).
*Data capture was less than 50% at Takeley station in 2013.

Sulphur dioxide

No SO_2 monitoring is undertaken in the Uttlesford District Council area.

Benzene

Benzene monitoring was undertaken at one location in the Uttlesford District Council area in 2014. The monitoring of VOCs resumed at the Birchanger automatic station on the 6th May 2014 due to complaints from nearby residents concerning aviation fuel odours. The results of the 2014 monitoring are provided in Table 2.6.

Table 2.6 Benzene monitoring results in Uttlesford in 2014 (μgm^{-3})

Site ID	2014	2014 Data Capture (%)
Birchanger	1.6	66

Concentrations were converted from ppb to μgm^{-3} using Box A1.5 "Conversion Factors for Gaseous Pollutants at 20ºC and 101.3 kPa" in LAQM TG.09 (Defra, 2009)
Exceedences of hourly mean AQO shown in ( ).

The running annual mean for benzene for 2014 is well below the AQO of 5 μgm^{-3}, but the main purpose of the monitoring is to identify peaks in concentrations corresponding with complaints. Monitoring of benzene should be continued to ensure peaks in concentrations are recorded.

Other pollutants

$PM_{2.5}$

UDC also monitor $PM_{2.5}$ at the Saffron Walden automatic monitor. Concerns from the EHO were raised regarding the validity of the data and a smart heater was fitted to the inlet in April to try to address this.

The results of the 2014 monitoring are provided in Table 2.7.

Table 2.7 $PM_{2.5}$ monitoring results in Uttlesford in 2014

Site ID	2014	Data Capture 2014 (%)
Saffron Walden	19.6	92

Concentrations were converted from ppb to μgm^{-3} using Box A1.5 "Conversion Factors for Gaseous Pollutants at 20ºC and 101.3 kPa" in LAQM TG.09 (Defra, 2009)

Ozone

Ozone has historically been monitored at Takeley in Uttlesford, due to its proximity to the National Trust Hatfield Forest. The results of the 2014 monitoring are provided in Table 2.8.

Table 2.8 Ozone monitoring results in Uttlesford in 2014 (μgm^{-3})

Site ID	2014	Data Capture 2014 (%)
Takeley	48.7	80

Concentrations were converted from ppb to μgm^{-3} using Box A1.5 "Conversion Factors for Gaseous Pollutants at 20ºC and 101.3 kPa" in LAQM TG.09 (Defra, 2009)
Exceedences of hourly mean AQO shown in ( ).

Summary of compliance with AQS objectives

Concentrations at relevant locations are below the objectives for all pollutants monitored, 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

Monitoring of annual mean NO_2 concentrations commenced in 2014 in two narrow streets in Saffron Walden, to inform local trends in the light of committed development to the east of the town. Castle Street and Church Street, have been considered in previous round of Review and Assessment and are within the AQMA declared in the area. Both streets have slow moving one-way traffic with frequent stopping to exit at junctions and residential properties within 2m of the kerb and tall buildings either side of the road.

Uttlesford Council 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

Uttlesford Council 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.

Uttlesford Council confirms that there are no new/newly identified roads with high flows of buses/HDVs.

3.4 Junctions

Uttlesford 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

Woodside Road, the Dunmow NE bypass, opened over its full length in 2014. It links Beaumont Hill B184 to Stortford Road B1256 and was constructed in sections as a planning agreement with the developer of nearby housing. The closest existing receptors to the newly constructed road are residential properties located at Cedar Close on the Woodlands Park development, at 31m from the road.

An air quality assessment undertaken as part of a planning application for a mixed-use development at Great Dunmow predicted annual mean NO_2 concentrations of 18 μgm^{-3} at Cedar Close in 2026, when the development opens (Karis Ltd, 2013). AADT provided in the air quality assessment was used to undertake a DMRB assessment to estimate concentrations of NO_2 and PM_{10} at the nearest receptor to Woodside Road in 2014.

The assessment concluded that predicted annual mean concentrations of NO_2 and PM_{10} are both below objective value of 40 μgm^{-3}. Additionally the annual mean NO_2 concentration is well below 60 μgm^{-3}, the

value above which exceedences of the 1-hour mean objective are likely. As a result, the air quality objectives are not likely to be breached at this location, and no further assessment is required.

Full details of the DMRB assessment are included in Appendix C.

Uttlesford Council has assessed new/newly identified roads with significantly changed traffic flows, and concluded that it will not be necessary to proceed to a Detailed Assessment.

3.6 Roads with significantly changed traffic flows

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

3.7 Bus and coach stations

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

4. Other transport sources

4.1 Airports

Stansted International Airport lies within Uttlesford District Council's local authority area and therefore requires assessment.

Uttlesford District Council currently operate two NO_2 diffusion tube monitoring sites at relevant receptors close to the airport (Airport 1, Thatched Cottage and Airport 2, Rose Cottage). The results of this monitoring, displayed in Table 2.2, indicate that the annual mean NO_2 air quality objective is being met at these sites.

Additionally, Ricardo-AEA published an air quality monitoring report in 2014 of concentrations at nearby automatic and passive monitors around Stanstead airport in 2013. Automatic continuous monitoring was carried out at two locations, referred to as Stansted 3 and Stansted 4. Diffusion tubes were co-located with the continuous monitor at Stansted 3 and also used at four other sites, to the north, south, east and west of the airport. Stansted 3 met this objective, with no hourly means recorded above the objective, Stansted 4 had 34 exceedences recorded and therefore did not meet the AQS objective. However, 32 of these occasions were during a two-day period when the site was affected by emissions from a nearby generator (Ricardo-AEA, 2014).

The annual mean AQO was met at Stansted 3, Stansted 4, and at all four of the diffusion tube monitoring sites. At Stansted 4, particularly high concentrations of NO_x were recorded on 11th and 12th October. It is likely that these high levels arose because of a generator, operating near to the monitoring apparatus (Ricardo-AEA, 2014). Average NO_2 concentrations are broadly similar to those from comparable urban background monitoring sites and have remained lower than those for London Heathrow Airport.

The passenger throughput of Stansted Airport rose during 2014 to reach 20mmpa by the end of the year. However, current NO_2 monitoring suggests that the annual mean air quality objective will be met at relevant receptors close to Stansted airport therefore there is no need to proceed to a Detailed Assessment.

Uttlesford District Council confirms that Stansted Airport lies within the Local Authority area and no changes to the airport which could affect air quality have occurred in 2013.

Stansted Airport has already been considered in a previous round of Review and Assessment and therefore there is no requirement to proceed to a Detailed Assessment.

4.2 Railways (diesel and steam trains)

Uttlesford Council 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.

4.3 Stationary trains

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

4.4 Moving trains

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

4.5 Ports (shipping)

Uttlesford 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

A list of prescribed industrial processes can be found in Appendix D. Uttlesford Council has identified no industrial sources that require assessment under the specified criteria.

New or proposed installations for which an air quality assessment has been carried out

Uttlesford 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.

Existing installations where emissions have increased substantially or new relevant exposure has been introduced

Uttlesford 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.

New or significantly changed installations with no previous air quality assessment

Uttlesford 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 is a permitted petrol station adjacent to the A120 which has a PVR stage II permit, therefore the throughput would be over 2000m^3, but no relevant exposure within 10m.

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

5.4 Poultry farms

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

6. Commercial and domestic sources

6.1 Biomass combustion – individual installations

There is a 2MW biomass combustion plant operating at Stansted Airport which burns virgin wood. Previous Rounds of Review and Assessment identified a need to undertake a screening assessment of the process (Uttlesford District Council, 2009).

The assessment found that the process is emitting NO_2 and PM_{10} rates below the target emission rates identified by the nomogram screening assessment, therefore the process is not likely to impact upon the AQO and as such, there is no requirement to proceed to a Detailed Assessment (Uttlesford District Council, 2009).

Uttlesford Council has assessed the biomass combustion plant, and concluded that it will not be necessary to proceed to a Detailed Assessment.

6.2 Biomass combustion – combined impacts

Uttlesford Council confirms that there are no biomass combustion plant in the Local Authority area.

6.3 Domestic solid-fuel burning

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

7. Fugitive or uncontrolled sources

Uttlesford Council confirmed that there is a large quarry that could be contributing to fugitive and uncontrolled sources.

Highwood Quarry on Stortford Road, Little Canfield has been identified as a potential source of fugitive particulate matter that meets specified criteria. The quarrying of sand and gravel began on the site in 2013. The quarry covers an area of 35 acres and is likely to take up to 15 years to complete.

The H1 risk assessment undertaken as part of the planning process determined that potential hazards from the proposed landfill, such as odour, dust and fugitive emissions, are not likely to be significant if the 'Accidents Risk Assessment and Management Plan' is implemented, and that no further assessment is required (Sewells Reservoir Construction Limited, 2013).

Further studies determined that the risk of dust being generated from Highwood Quarry is low due to the nature of the material, the limited level of throughput, the location of the unit, and that it will be operated on a campaign basis (D. K. Symes Associates, 2013).

Uttlesford Council confirms that air quality assessments, including consideration for the risk of dust, have been undertaken at relevant sites and confirmed that a Detailed Assessment for PM_{10} is not required.

8. Conclusions and proposed actions

8.1 Conclusions from new monitoring data

The monitoring undertaken within the Council has shown that there are no exceedences of the air quality objectives for nitrogen dioxide at relevant locations. A Detailed Assessment is therefore not required.

The trend in the monitoring data has shown generally stable concentrations observed since 2011.

8.2 Conclusions from assessment of sources

New roads constructed or proposed since the last round of review and assessment

A DMRB screening assessment was undertaken to estimate concentrations of NO_2 and PM_{10} at the nearest receptor to the newly constructed Woodside Road in 2014.

The assessment concluded that predicted annual mean concentrations of NO_2 and PM_{10} are both below objective value of 40 μgm^{-3}. Additionally the annual mean NO_2 concentration is well below 60 μgm^{-3}, the value above which exceedences of the 1-hour mean objective are likely. As a result, the air quality objectives are not likely to be breached at this location, and no further assessment is required.

Airports

Current NO_2 monitoring suggests that the annual mean air quality objective will be met at relevant receptors close to Stansted airport therefore there is no need to proceed to a Detailed Assessment.

Fugitive or uncontrolled sources

Air quality assessments undertaken, including consideration for the risk of dust, at the Highwood Quarry confirmed that potential hazards from the proposed landfill, such as odour, dust and fugitive emissions, are not likely to be significant if the 'Accidents Risk Assessment and Management Plan' is implemented, and thus a Detailed Assessment for PM_{10} is not required.

8.3 Proposed actions

The USA has not identified any need to proceed to a Detailed Assessment for any pollutant.

The USA has not identified any need for additional monitoring or changes to the current monitoring programme.

The next action for Uttlesford Council will be to submit a 2016 LAQM Progress Report.

References

Defra (2009). Local Air Quality Management Technical Guidance, *LAQM.TG(09*).

D. K. Symes Associates (2013) on behalf of Sewells Reservoir Construction Limited, *The winning and working of sand and gravel, erection of a concrete plant, workshop and ancillary buildings, and the importation and treatment of inert waste to produce secondary aggregate and reclamation material for progressive restoration to landscaped farmland.*

Defra (2015). *Nitrogen Dioxide fall off with distance*. Available at: http://laqm.defra.gov.uk/tools-monitoring-data/no2-falloff.html

Highways Agency (2007) Design Manual for Roads and Bridges.

Kairus Ltd (2013) Air Quality Assessment - Great Dunmow, Uttlesford

Ricardo-AEA (2014), Air Quality Monitoring at Stansted Airport: *Annual Report for 2013.*

Sewells Reservoir Construction Limited (2013), Highwood Quarry Inert Landfill, Environmental Permit (EP) Application - *H1 Environmental Risk Assessment*, SLR Ref: 412.02934.00004 /H1.

Uttlesford District Council (2009), *Uttlesford District Council LAQM Updating and screening Assessment*

Uttlesford Council (2014) *2014 Air Quality Progress Report for Uttlesford Council.*

Appendix A
Raw diffusion tube data 2014

Table A.1 Raw diffusion tube data 2014

Site ID	January	February	March	April	May	June	July	August	September	October	November	December	Unadjusted Annual Mean
UT001	36.28	45.60	36.87	35.83	36.29	37.08	32.39	31.23	37.10	41.27	42.81	43.31	38.01
UT002	24.74	28.03	28.88	21.54	-	19.34	18.34	18.04	24.64	25.42	26.56	26.09	23.78
UT003	21.98	22.63	22.04	13.90	11.82	9.15	8.19	9.38	12.06	16.56	21.28	19.43	15.70
UT004	39.47	54.25	50.52	39.66	39.4	41.27	34.28	34.22	-	47.04	48.17	43.84	**42.92**
UT005	40.25	45.55	47.18	45.66	-	45.11	40.71	40.01	53.79	42.14	40.94	46.64	**44.36**
UT006	22.75	22.37	23.03	14.66	13.18	12.22	9.77	10.80	14.53	19.92	24.14	20.42	17.32
UT007	25.69	28.97	10.09	23.91	20.99	20.05	21.11	20.46	24.48	25.20	24.03	30.78	22.98
UT008	33.61	35.35	36.60	30.36	32.27	32.04	22.60	20.75	28.44	29.81	34.85	24.97	30.14
UT009	34.24	44.46	37.39	40.01	38.02	39.95	33.28	31.87	38.09	42.37	35.99	47.87	38.63
UT010	29.08	38.70	31.60	12.49	27.56	21.39	20.47	23.04	23.03	35.14	31.86	33.89	27.35
UT011	35.45	38.85	37.56	33.78	36.93	31.25	29.17	30.60	35.13	35.17	36.84	41.76	35.21
UT012	27.46	28.74	26.50	19.66	17.14	17.85	13.79	15.94	20.24	23.50	28.92	22.42	21.85
UT013	27.75	31.61	28.49	22.80	21.45	19.59	17.52	17.44	25.50	27.36	32.69	29.76	25.16
UT014	27.04	32.26	31.07	23.95	21.46	19.61	16.44	18.25	24.06	28.16	33.10	30.85	25.52
UT024	18.20	16.26	21.54	-	-	9.94	10.23	9.83	13.92	15.86	17.93	21.37	15.51

Site ID	January	February	March	April	May	June	July	August	September	October	November	December	Unadjusted Annual Mean
UT025	18.49	21.33	21.21	14.25	12.69	10.67	10.93	10.56	15.58	14.71	21.77		15.65
UT026	16.34	17.66	18.60	12.40	10.13	7.76	8.24	10.01	11.18	14.16	16.36	20.77	13.63
UT027	28.41	31.57	28.34	26.08	22.13	19.07	17.43	17.98	23.87	28.12	31.55	32.29	25.57
UT028	37.33	45.74	36.87	40.67	40.2	39.76	30.93	35.77	44.13	29.93	47.60	54.00	**40.24**
UT029	32.25	34.57	30.82	26.57	26.52	20.69	19.92	21.43	26.19	43.92	30.78	31.69	28.78
UT030	32.08	31.55	34.10	29.48	28.99	30.06	23.50	-	-	-	37.41	33.80	31.22
UT031	38.04	32.19	31.40	21.17	22.3	22.27	17.76	17.74	22.98	24.27	26.39	27.39	25.33
UT032	26.52	27.70	23.35	18.55	15.11	14.81	9.51	13.50	17.37	19.05	24.85	23.06	19.45
UT033	30.74	34.44	34.05	31.73	29.24	28.34	26.66	22.61	30.17	30.91	38.67	33.63	30.93
UT034	-	-	-	28.71	29.64	29.22	23.76	23.75	31.81	33.34	37.09	35.92	30.36
UT035	-	-	-	23.57	20.2	20.22	20.07	20.85	29.39	28.40	-	-	21.02
UT036	-	-	-	-	-	-	-	19.48	22.34	26.62	34.29	25.06	25.56
UT037	-	-	-	-	-	-	-	19.24	22.53	33.42	41.48	31.20	29.57

Notes:
'-' Indicates no data.
Exceedences of annual mean are shown in **bold.**

Appendix B
QA:QC data

Diffusion tube bias adjustment factors

National bias adjustment

The national bias adjustment factor has been taken from Defra's UK national bias adjustment spreadsheet (version 03/15) and is based on the results of 9 studies in the UK. The bias adjustment factor for 2014 monitored data is 0.91.

Local adjustment

A local bias adjustment factor was calculated for all automatic and diffusion tube data, as shown in Figure B1. Poor data capture was recorded for one month of automatic monitoring data in July.

Figure B1 Precision and accuracy of local bias adjustment factor

Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements										Automatic Method		Data Quality Check	
Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean	Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
1	08/01/2014	04/02/2014	27.8	27.0	28.4	28	0.7	2	1.7	31.5	100.0	Good	Good
2	05/02/2014	04/03/2014	31.6	32.3	31.6	32	0.4	1	1.0	27.5	100.0	Good	Good
3	05/03/2014	01/04/2014	28.5	31.1	28.3	29	1.5	5	3.8	28.7	100.0	Good	Good
4	02/04/2014	29/04/2014	22.8	24.0	26.1	24	1.7	7	4.1	21.1	100.0	Good	Good
5	30/05/2014	28/06/2014	21.5	21.5	22.1	22	0.4	2	1.0	16.9	100.0	Good	Good
6	29/06/2014	01/07/2014	19.6	19.6	19.1	19	0.3	2	0.8	11.8	100.0	Good	Good
7	02/07/2014	29/07/2014	17.5	16.4	17.4	17	0.6	3	1.5	9.2	60.7	Good	r Data Capture
8	30/07/2014	26/08/2014	17.4	18.3	18.0	18	0.4	2	1.0	15.4	100.0	Good	Good
9	27/08/2014	30/09/2014	25.5	24.1	23.9	24	0.9	4	2.2	19.6	100.0	Good	Good
10	01/10/2014	28/10/2014	27.4	28.2	28.1	28	0.5	2	1.1	20.2	100.0	Good	Good
11	29/10/2014	02/12/2014	32.7	33.1	31.6	32	0.8	2	2.0	25.2	100.0	Good	Good
12	03/12/2014	06/01/2015	29.8	30.9	32.3	31	1.3	4	3.2	31.3	100.0	Good	Good
13													
												Good precision	Good Overall

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Overall survey -->

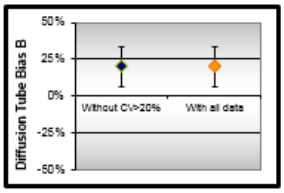
(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Saffron Walden

Precision 12 out of 12 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval) without periods with CV larger than 20%	
Bias calculated using 11 periods of data	
Bias factor A	0.87 (0.77 - 0.98)
Bias B	15% (2% - 29%)
Diffusion Tubes Mean:	26 µgm^{-3}
Mean CV (Precision):	3
Automatic Mean:	23 µgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	23 (20 - 26) µgm^{-3}

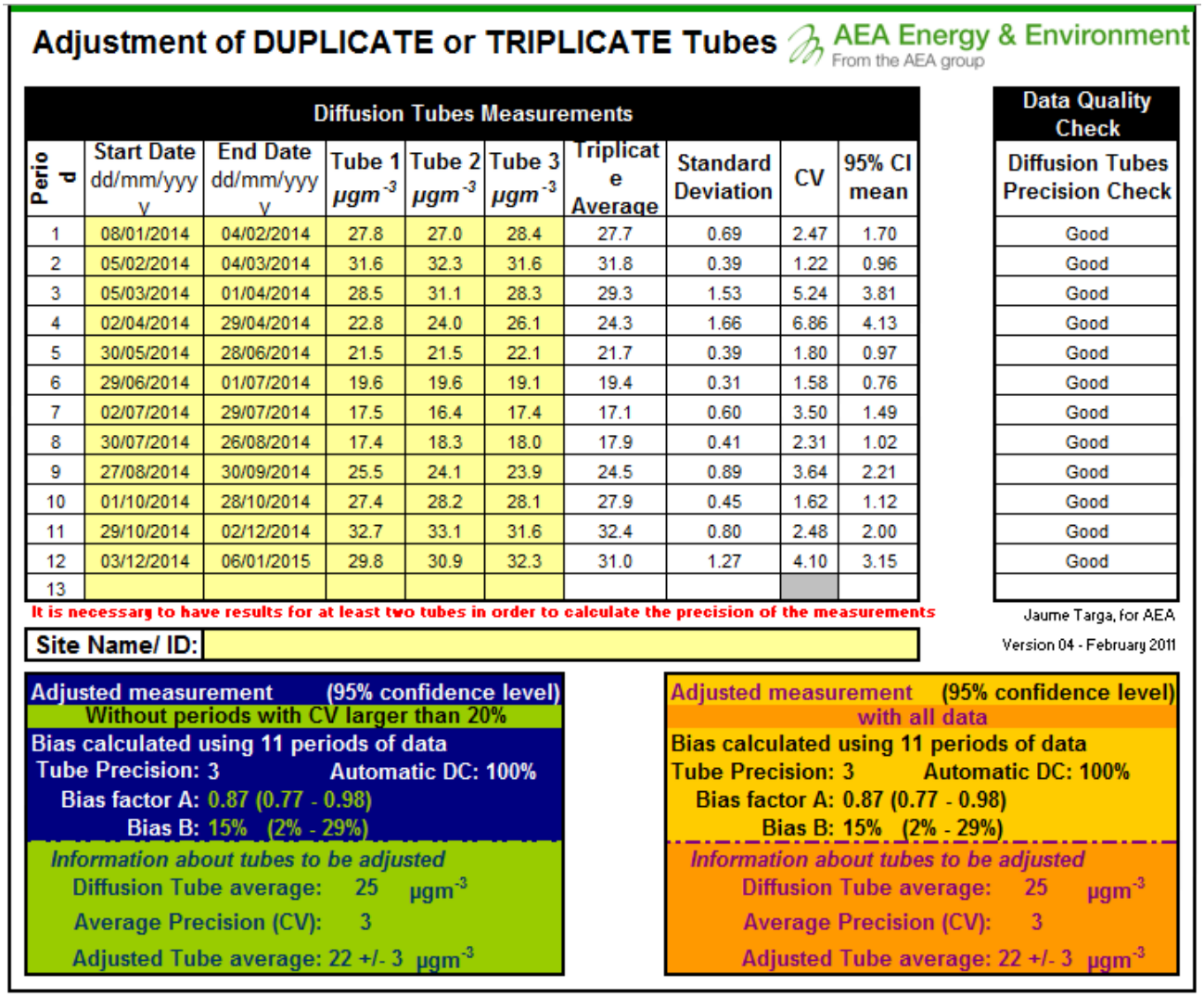
Accuracy (with 95% confidence interval) WITH ALL DATA	
Bias calculated using 11 periods of data	
Bias factor A	0.87 (0.77 - 0.98)
Bias B	15% (2% - 29%)
Diffusion Tubes Mean:	26 µgm^{-3}
Mean CV (Precision):	3
Automatic Mean:	23 µgm^{-3}
Data Capture for periods used:	100%
Adjusted Tubes Mean:	23 (20 - 26) µgm^{-3}



Jaume Targa, for AEA
Version 04 - February 2011

A local bias adjustment factor was calculated of 0.87 for all automatic and diffusion tube data, as shown in Figure B2.

Figure B2 Adjustment of triplicate tubes for local bias adjustment factor



Adjustment of DUPLICATE or TRIPLICATE Tubes — AEA Energy & Environment, From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 μgm^{-3}	Tube 2 μgm^{-3}	Tube 3 μgm^{-3}	Triplicate Average	Standard Deviation	CV	95% CI mean	Data Quality Check: Diffusion Tubes Precision Check
1	08/01/2014	04/02/2014	27.8	27.0	28.4	27.7	0.69	2.47	1.70	Good
2	05/02/2014	04/03/2014	31.6	32.3	31.6	31.8	0.39	1.22	0.96	Good
3	05/03/2014	01/04/2014	28.5	31.1	28.3	29.3	1.53	5.24	3.81	Good
4	02/04/2014	29/04/2014	22.8	24.0	26.1	24.3	1.66	6.86	4.13	Good
5	30/05/2014	28/06/2014	21.5	21.5	22.1	21.7	0.39	1.80	0.97	Good
6	29/06/2014	01/07/2014	19.6	19.6	19.1	19.4	0.31	1.58	0.76	Good
7	02/07/2014	29/07/2014	17.5	16.4	17.4	17.1	0.60	3.50	1.49	Good
8	30/07/2014	26/08/2014	17.4	18.3	18.0	17.9	0.41	2.31	1.02	Good
9	27/08/2014	30/09/2014	25.5	24.1	23.9	24.5	0.89	3.64	2.21	Good
10	01/10/2014	28/10/2014	27.4	28.2	28.1	27.9	0.45	1.62	1.12	Good
11	29/10/2014	02/12/2014	32.7	33.1	31.6	32.4	0.80	2.48	2.00	Good
12	03/12/2014	06/01/2015	29.8	30.9	32.3	31.0	1.27	4.10	3.15	Good
13										

It is necessary to have results for at least two tubes in order to calculate the precision of the measurements

Site Name/ ID:

Jaume Targa, for AEA

Version 04 - February 2011

Adjusted measurement (95% confidence level)
Without periods with CV larger than 20%
Bias calculated using 11 periods of data
Tube Precision: 3 Automatic DC: 100%
Bias factor A: 0.87 (0.77 - 0.98)
Bias B: 15% (2% - 29%)
Information about tubes to be adjusted
Diffusion Tube average: 25 μgm^{-3}
Average Precision (CV): 3
Adjusted Tube average: 22 +/- 3 μgm^{-3}

Adjusted measurement (95% confidence level)
with all data
Bias calculated using 11 periods of data
Tube Precision: 3 Automatic DC: 100%
Bias factor A: 0.87 (0.77 - 0.98)
Bias B: 15% (2% - 29%)
Information about tubes to be adjusted
Diffusion Tube average: 25 μgm^{-3}
Average Precision (CV): 3
Adjusted Tube average: 22 +/- 3 μgm^{-3}

The calculated local bias adjustment factor is more representative that the National bias adjustment factor and thus the local bias adjustment factor of 0.87 was applied to the raw data (and not the national bias adjustment factor of 0.91).

Table B.1 below details the bias adjustment factors for the period 2011 through 2014 used to adjust the Uttlesford monitoring data.

Table B.1 Previous bias adjustment factors

Year	National bias adjustment factor
2011	0.80
2012	0.90
2013	0.97
2014	0.87

QA/ QC of diffusion tube monitoring

Gradko International are a UKAS accredited laboratory, complying with the requirements of ISO/IEC 17025. They also partake in quality schemes including the Workplace Analysis Scheme for Proficiency (WASP), Laboratory Environmental Analysis Proficiency Scheme (LEAP) and Field Intercomparison.

WASP is a recognised performance-testing programme for laboratories undertaking NO_2 diffusion tube analysis as part of the UK NO_2 monitoring network. The scheme is designed to help laboratories meet the European Standard EN48213. The Laboratory performance was deemed satisfactory for 100% of samples that were submitted between April 2013 and February 2015[1].

Short-term to long-term data adjustment

Data capture for two new sites added in April 2014, UT034 and UT035, and two sites added in August 2014, UT036 and UT037, were below the recommended 75%, therefore annualisation was undertaken, in accordance with the guidance in Box 3.2 of LAQM.TG(09) (Defra, 2009). The correction factors in the table below have been derived using the average ratio of the annual mean to the period mean for the monitoring data obtained from the Southend-on-Sea and Thurrock London Grays Road monitors, which are available on the Essex-air website[2]. These factors were applied to the measured period mean at the four sites to annualise the data. This is in accordance with Box 3.2 of LAQM.TG (09).

Table B.2 Adjustment factors to estimate annual mean concentrations

Diffusion Tube	Long term site	Annual mean	Period mean	Ratio	Average
UT034	Southend	19.35	18.28	1.06	1.04
	Thurrock	26.57	26.15	1.02	
UT035	Southend	19.35	16.00	1.21	1.16
	Thurrock	26.57	23.86	1.11	
UT036	Southend	19.35	20.19	0.96	0.94
	Thurrock	26.57	29.09	0.91	
UT037	Southend	19.35	20.19	0.96	0.94
	Thurrock	26.57	29.09	0.91	

Fall-off with distance calculator

Diffusion Tubes UT004 and UT028 showed concentrations within 10% of the AQO after applying the bias adjustment calculations. Figures B3 and B4 show the concentrations calculated using the nitrogen dioxide fall-off with distance calculator.

[1] Defra's Local Air Quality Management Support Pages http://laqm.defra.gov.uk/documents/LAQM-WASP-Rounds-121--124-and-AIR-PT-Rounds-1-3-4-6-%28April-2013--February-2015%29-NO2-report.pdf

[2] http://www.essexair.org.uk/

Figure B3 UT004 diffusion tube NO_2 fall off with distance calculations

This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Air Quality CONSULTANTS

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	1.4	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	2.2	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	(Note 2)	13.1	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)	37.3	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)	34.9	$\mu g/m^3$

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

Issue 4: 25/01/11. Created by Dr Ben Marner; Approved by Prof Duncan Laxen. Contact: benmarner@aqconsultants.co.uk

Figure B4 UT028 diffusion Tube NO_2 fall off with distance calculations

This calculator allows you to predict the annual mean NO_2 concentration for a location ("receptor") that is close to a monitoring site, but nearer or further the kerb than the monitor. The next sheet shows your results on a graph.

Air Quality CONSULTANTS

Enter data into the yellow cells

Step 1	How far from the KERB was your measurement made (in metres)?	(Note 1)	2	metres
Step 2	How far from the KERB is your receptor (in metres)?	(Note 1)	2.8	metres
Step 3	What is the local annual mean background NO_2 concentration (in $\mu g/m^3$)?	(Note 2)	13.1	$\mu g/m^3$
Step 4	What is your measured annual mean NO_2 concentration (in $\mu g/m^3$)?	(Note 2)	35	$\mu g/m^3$
Result	The predicted annual mean NO_2 concentration (in $\mu g/m^3$) at your receptor	(Note 3)	33.3	$\mu g/m^3$

Note 1: In some cases the term "kerb" may be taken to be the edge of the trafficked road - see the FAQ at http://laqm2.defra.gov.uk/FAQs/Monitoring/Location/index.htm for further details. Distances should be measured horizontally from the kerb and assumes that the monitor and receptor have similar elevations. Each distance should be greater than 0.1m and less than 50m (In practice, using a value of 0.1m when the monitor is closer to the kerb than this is likely to be reasonable). The receptor is the location for which you wish to make your prediction. The monitor can either be closer to the kerb than the receptor, or further from the kerb than the receptor. The closer the monitor and the receptor are to each other, the more reliable the prediction will be. When your receptor is further from the kerb than your monitor, it is recommended that the receptor and monitor should be within 20m of each other. When your receptor is closer to the kerb than your monitor, it is recommended that the receptor and monitor should be within 10m of each other.

Note 2: The measurement and the background must be for the same year. The background concentration could come from the national maps published at www.airquality.co.uk, or alternatively from a nearby monitor in a background location.

Note 3: The calculator follows the procedure set out in Box 2.3 of LAQM TG(09). The results will have a greater uncertainty than the measured data. More confidence can be placed in results where the distance between the monitor and the receptor is small than where it is large.

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Appendix C
DMRB screening assessment

New roads constructed or proposed since the last round of review and assessment

Woodside Road

Woodside Road, the Dunmow NE bypass, opened over its full length in 2014. It links Beaumont Hill B184 to Stortford Road B1256 and was constructed in sections as a planning agreement with the developer of nearby housing.

The closest existing receptors to the newly constructed road are residential properties located at Cedar Close on the Woodlands Park development, at 31m from the road.

Screening Assessment Methodology

The Design Manual for Roads and Bridges (DMRB) screening methodology (Highways Agency, 2007) has been used for this assessment in order to quantify the likely ground level concentrations of NO_2 and PM_{10} that the worst case receptor (the nearest property to Woodside Road, located on Cedar Close) is exposed to.

Model Inputs

The DMRB assessment incorporates numbers of road traffic vehicles, vehicle speeds on the local roads, traffic composition and the distance from the receptor to the road centreline. An air quality assessment undertaken as part of a planning application for a mixed-use development at Great Dunmow includes Annual Average Daily Traffic Flows (AADT) and other required information in order to undertake the DMRB assessment at Woodside Road (Kairus Ltd, 2013). The AADT is based on traffic flows estimated for 2026, therefore average speeds have been reduced to account for a worst case estimation of pollutant concentrations. The traffic data used in the assessment is contained in Table C1 below, while the modelled receptor location is shown in Table C2.

Table C1 Traffic data used in the assessment

Road Name	AADT	Speed (kph)	Road type	% LDV	%HDV
Woodside Road	8836.0	20	B	98	2

Table C2 Traffic data used in the assessment

Receptor Name	X	Y	Distance to centreline of road (m)	Background NO_2 (μgm^{-3})
Cedar Close Receptor	561445	222165	31	12.2

Notes:
Background concentrations were obtained from the Defra Background Mapping tool.

Model Verification

Modelled results should be compared with measured data to determine whether the model results need adjusting to more accurately reflect local air quality. There is no monitoring carried out in Great Dunmow, therefore verification of the model results cannot be carried out. Traffic speeds have therefore been reduced within the modelling process to ensure higher emissions are modelled and thus the potential for the model to under-predict pollutant concentrations is minimised.

Results

Table C3 below details the result of the assessment with regard to predicted concentrations at the receptor. Predicted annual mean concentrations of NO_2 and PM_{10} are both below objective value of 40 μgm^{-3}. Additionally the annual mean NO_2 concentration is well below 60 μgm^{-3}, the value above which exceedences of the 1-hour mean objective are likely. As a result, the air quality objectives are not likely to be breached at this location, and no further assessment is required.

Table C3 Predicted concentrations (μgm^{-3}) at modelled human receptor locations

Receptor Name	**Annual mean NO_2**	**Annual mean PM_{10}**
Cedar Close Receptor	13.9	19.6

Appendix D
Permit list

Operator	X	Y	Process	New source
Acrow Galvanizing	555276	239193	Hot Dip galvanizing	N
Pulse Flexible Packaging	554852	238389	Printing of flexible packaging	N
SGA Technologies Ltd	554790	238262	Surface treatment of metal	Y
Cemex Concrete SAP	554011	222124	Concrete batching	N
Freemix	560150	220975	Concrete batching	Y
R B Haigh	559500	229050	Concrete batching	y
Station Coachworks Dunmow	563006	221415	Vehicle respraying	N
E Corr x 2	555210	225480	Concrete crushing	N
R B Haigh	559500	229050	Concrete crushing	Y
Multiclean	556286	221238	Dry Cleaning	Y
Barkers of Dunmow	562717	222049	Dry Cleaning	N
Saffron Walden Laundry Co	553835	228344	Dry Cleaning	N
Suit-ability SW	553748	238429	Dry Cleaning	N
TyreMart	563633	220947	Small waste oil burner	N
Fiern Engines	563467	221185	Small waste oil burner	N

Operator	X	Y	Process	New source
Carros Automotive	552127	234735	Small waste oil burner	Y
Premier Garage	552163	233965	Small waste oil burner	Y
Belle Trailers	563466	229702	Small waste oil burner	Y
Chesterford Engineering	550452	242833	Small waste oil burner	Y
D Bonney	549131	221185	Small waste oil burner	Y
Jet Stansted	551242	225469	Petrol Vapour Recovery	N
TCS Stansted	550983	225125	Petrol Vapour Recovery	N
Dunmow Convenience Stores	563649	220749	Petrol Vapour Recovery	N
Tesco Stores Ltd SW	555080	238370	Petrol Vapour Recovery II	N
Tesco Stores Ltd Dunmow	561533	221968	Petrol Vapour Recovery II	N
Welcome Break Birchanger	551226	221246	Petrol Vapour Recovery II	N
Starthill Service Station	551838	221498	Petrol Vapour Recovery	N
Saracens Filling Station	561320	230830	Petrol Vapour Recovery	N
Stansted AP	552780	222747	Petrol Vapour Recovery	N
BP Oil UK SAP	554903	222036	Petrol Vapour Recovery II	N

Operator	X	Y	Process	New source
Avis Rent a Car SAP	555118	222781	Petrol Vapour Recovery	N
Hertz Rent a Car SAP	555162	222820	Petrol Vapour Recovery	N
Europcar UK Ltd SAP	555154	222829	Petrol Vapour Recovery	N
Central garage Newport	552087	233578	Petrol Vapour Recovery	N

Appendix E
Automatic monitor faults

Table E1 Automatic monitor faults diagnosis

Station	Dates	Fault
Takeley	16/01/14 – 12/03/14	Phone line severed
	12/03/14 – 23/04/14	Maintenance company unable to source spare part needed
	6/05/14 – 18/06/14	Fault unknown, Loan analyser installed
	29/08/14	Fault with loan analyser
	4/09/15	Original analyser re-instated
	18/11/14 – 21/11/14	Fault
Birchanger	1/01/14 – 9/01/14	Power failure – switched off at source by 3rd party
	9/04/14 – 10/04/14	Power failure
	27/05/14	Power failure
	5/09/14 – 9/09/14	BAM tape stuck
	19/09/14 – 22/09/14	Power failure
	21/10/14 – 23/10/14	Power failure
	1/12/14	Power failure