



# Detailed Assessment of Air Quality for Ipswich Borough Council

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

November, 2020

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## **Executive Summary**

Part IV of the Environment Act 1995 placed a requirement on local authorities to periodically review and assess air quality in their districts. This involves identifying those areas where it is considered likely that the Air Quality Objectives will be exceeded. Local authorities have a duty to designate any such locations as Air Quality Management Areas (AQMA's) and pursue improvements in air quality in those areas.

Ipswich currently has 5 AQMA's. This report is written in recognition that the boundaries of the existing AQMA's need reviewing on a regular basis to ensure they remain relevant.

This report has been prepared in accordance with Local Air Quality Management Guidance Note LAQM.TG (16).

Monitoring data indicates that there is an area outside AQMA 3 where the annual mean nitrogen dioxide (NO<sub>2</sub>) objective level is being exceeded. In addition, there is an area within AQMA 1 that, for several years, has not exceeded the annual mean objective level. Furthermore, once bias and distance correction have been applied, there have been no measured exceedances of the air quality objective for NO<sub>2</sub> concentrations over the last six years in AQMA 4.

In light of this, the detailed assessment recommends the following:

- The boundary of AQMA No. 3 is amended (marginally increased).
- The boundary of AQMA No. 1 is amended (decreased).
- AQMA No. 4 is revoked.

Ipswich Borough Council will now consult with DEFRA and other statutory consultees, members, Suffolk County Council and members of the public regarding this decision.

Monitoring results in AQMA No 2. and AQMA No 5. still indicate NO<sub>2</sub> concentrations above the air quality objective at various locations, and as such, no plans are being made to amend the boundary of these AQMA's.

Monitoring of nitrogen dioxide will continue at a number of locations within the Ipswich borough using both continuous monitoring and diffusion tubes. This will ensure that the AQMA's remain relevant, will identify other areas of poor air quality, and will, over time, give an indication of any improvement in air quality as the actions within the Air Quality Action plan are implemented.

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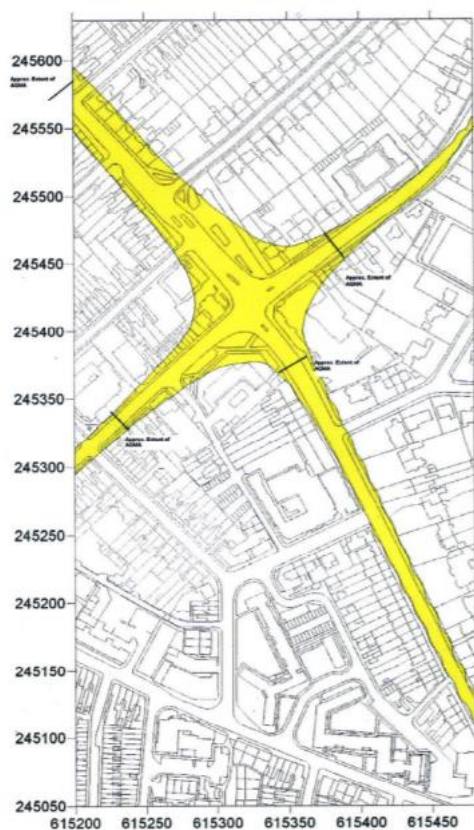
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## **Background to Local Air Quality Management in Ipswich**

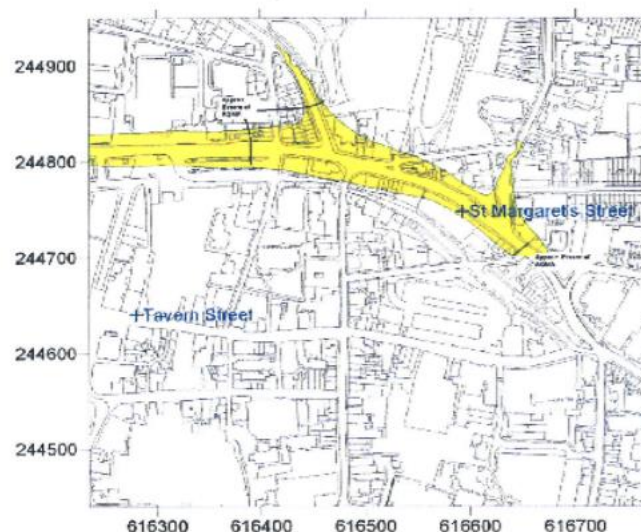
Ipswich Borough Council has completed six rounds of air quality review and assessment since 2000 and has submitted Annual Status Reports since 2016 as part of the LAQM system.

During the second round of review and assessment in 2003, the Council identified three areas where it was considered air quality objectives for Nitrogen Dioxide (NO<sub>2</sub>) were likely to be exceeded. Faber Maunsell - AECOM were commissioned in 2005 to undertake a Detailed Assessment which verified that air quality objectives were not being met due to an exceedance of the annual mean of 40µg/m<sup>3</sup> for NO<sub>2</sub>. The Council subsequently declared three AQMA's on 11th April 2006. The extent of the AQMA's as originally declared are shown below:

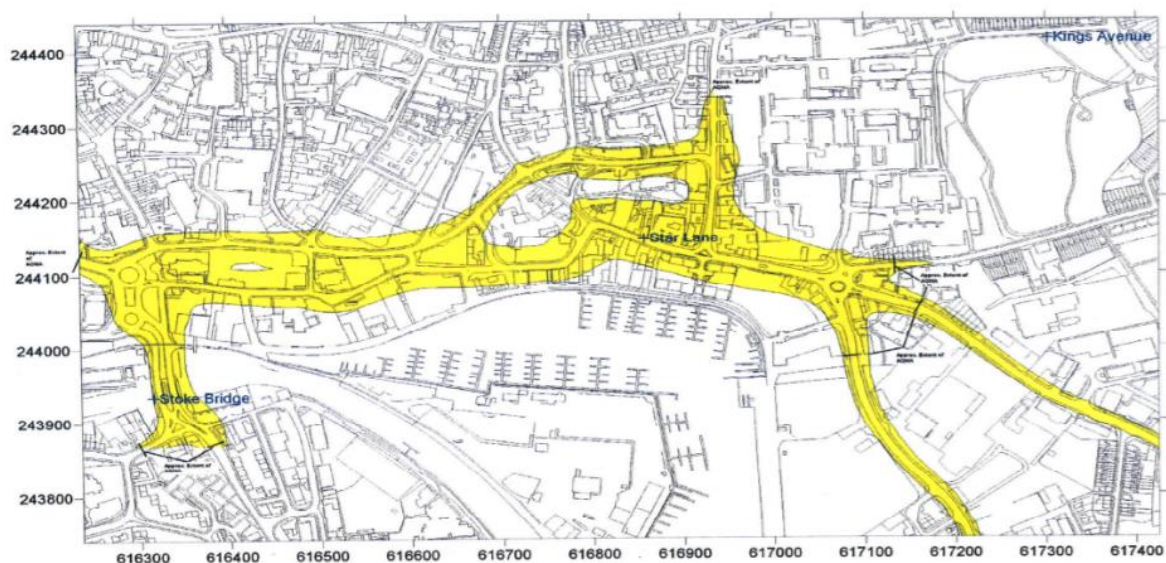
***Figure 1: Ipswich Air Quality Management Order No.1, 2006: Norwich Road, Chevallier Street and Valley Road***



**Figure 2: Ipswich Air Quality Management Order No.2, 2006: Junction of Crown Street with Fonnereau Road and St Margaret's Street and St Margaret's Plain**



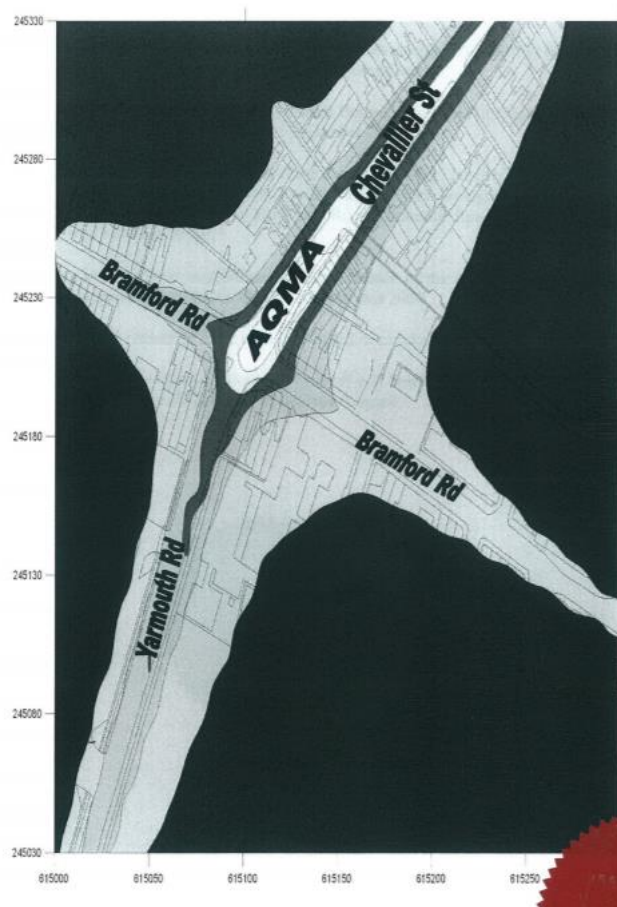
**Figure 3: Ipswich Air Quality Management Order No 3 2006: Star Lane gyratory system and St Helen's Street/Grimwade Street**



The Council produced an Air Quality Action Plan (AQAP) in 2008 for the three declared AQMAs. Source apportionment identified road traffic emissions as the main source of pollution responsible for the exceedance of the annual average Nitrogen Dioxide objective.

As part of the Council's third round of review and assessment, a Detailed Assessment, finalised August 2010, concluded that there were likely to be exceedances of the annual mean NO<sub>2</sub> objective at the Bramford Road/Yarmouth Road/Chevallier Street junction. The predicted exceedances of the annual mean objective were attributed to slow moving vehicles, congestion and queuing traffic. A new AQMA was declared in December 2010 and is shown below:

**Figure 4: Ipswich Air Quality Management Order No 4, 2010: Bramford Road, Yarmouth Road, Chevallier Street junction.**



The Council carried out Detailed Assessments in 2012 as part of its fifth round of review and assessment and concluded that specific areas along St Helens Street be considered for declaration as an AQMA. Furthermore, it concluded that specific areas along St Matthews Street be considered for declaration as an AQMA.

In 2015, a further Detailed Assessment was carried out. Monitoring data indicated some areas of Ipswich where the annual average nitrogen dioxide objective level were being exceeded outside of the existing AQMAs. In addition, there were areas within the existing AQMAs where, for several years, there had not been exceedances of the objective levels. As such, it was recommended that AQMAs No. 1, 2 and 3 were amended and one new AQMA declared. Again, traffic emissions were identified as the main pollution source responsible for the declaration of an additional AQMA. In 2017, the existing AQMAs were amended and AQMA No.5 was declared. AQMA No:5 as originally declared is shown below (it has not been amended since the original declaration):



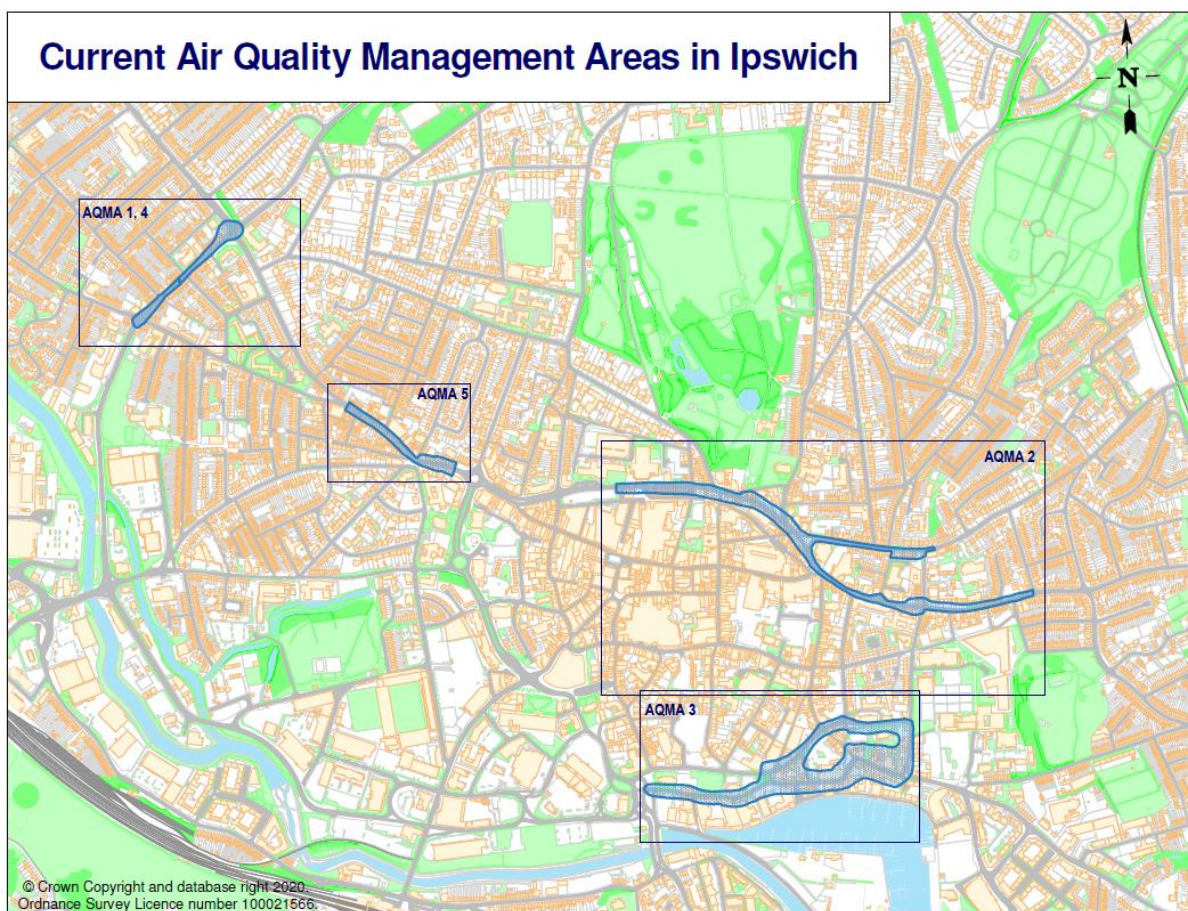
**Figure 5: Ipswich Air Quality Management Order No 5, 2017: St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road**



Currently, Ipswich Borough Council has declared a total of five AQMAs, all due to continued exceedance of the annual mean NO<sub>2</sub> objective level. These are:

- Ipswich AQMA No.1 - Encompassing the land in and around the junction of Norwich Road, Chevallier Street and Valley Road, extending along Chevallier Street to beyond the junction with Waterloo Road (declared 2006; amended 2017);
- Ipswich AQMA No. 2 - From the junction with Peel Street, extending along Crown Street, St Margarets Street and St Helens Street to the junction with Palmerston Road, and from St Margarets Street extending up Woodbridge Road to just beyond the junction with Argyle Street. (declared 2006; amended 2017);
- Ipswich AQMA No. 3 - Following the route of the Star Lane / Key Street / College Street gyratory clockwise from the junction with Lower Orwell Street, extending along Star Lane, Grimwade Street, Fore Street, Salthouse Street, Key Street and College Street, terminating at the junction with Bridge Street (declared 2006; amended 2017);
- Ipswich AQMA No. 4 - Incorporating the Bramford Road / Yarmouth Road / Chevallier Street junction and part of Chevallier Street (declared 2010);
- Ipswich AQMA No. 5 - Incorporating the land in or around St. Matthews Street / Norwich Road between the Civic Drive roundabout and Bramford Road (declared 2017).

Figure 6 below shows the current Air Quality Management Areas in Ipswich.



**Figure 6: Current Air Quality Management Areas in Ipswich**

In 2019, the Council published its latest Air Quality Action Plan aimed at addressing the exceedances of the NO<sub>2</sub> annual mean objective level.

The latest 2020 Annual Status Report (ASR) concluded that there is an exceedance of the NO<sub>2</sub> annual mean objective level just outside the boundary of AQMA 3. Furthermore, the ASR indicated that there are a number of locations where exceedances of the annual NO<sub>2</sub> objective level have not been experienced for several years. In light of this, the Council is now reviewing the monitoring data to determine whether the existing AQMAs are still appropriate and whether any require amendment/revocation.

A copy of the Council's air quality reports can be found at:

<https://www.ipswich.gov.uk/airqualitymanagement>

## **Detailed Assessment of NO<sub>2</sub> Monitoring in Ipswich**

### **Overview of Monitoring**

DEFRA's LAQM Helpdesk has previously confirmed that dispersion modelling is not essential for the purposes of a Detailed Assessment. Paragraph 3.49 of LAQM.TG(16) supports this and states *"in some instances if compelling evidence exists, detailed modelling to support the decision to amend/revoke an AQMA may not be necessary and an AQMA may be amended or revoked following a screening assessment or on the basis of robust monitoring evidence."*

The Council currently monitors NO<sub>2</sub> levels using 99 diffusion tubes positioned at 88 locations in and around the perimeter of the AQMAs, at background locations, or at locations where it is suspected that concentrations may be close to the annual objective level. In addition, the Council operates two continuous monitors, one of which is located within AQMA No.1 on Chevallier Street, and the other being located just outside the periphery of AQMA No.5 on St Matthews Street.

Monitoring results in AQMA No 2. and AQMA No 5. still indicate NO<sub>2</sub> concentrations above the air quality objective at various locations, and as such, no plans are being made to amend the boundary of these AQMAs. In light of this, the focus of this detailed assessment is on AQMA's No.1, 3 and 4.

This detailed assessment is based on diffusion tube readings placed out in and around the perimeters of AQMAs No.1, 3 and 4 over the last 6 years. It is also based on continuous monitor data obtained from the Chevallier Street monitor over the last 3 years.

In accordance with the current LAQM regime in the UK, a copy of this assessment will be appended to the Councils next Annual Status Report.

#### *Diffusion Tube Analysis*

Triplicate tubes reviewed in this assessment have been suitably checked for precision and accuracy and were found to have good precision overall. All diffusion tubes reviewed in the assessment had a high data capture rate (above 75%) with the exception of diffusion tube 31 in 2016. This tube was annualised in accordance with Box 7.9 in LAQM.TG(16).

All diffusion tube results have been suitably corrected for bias. A national bias correction factor was applied to results between 2014 – 2017. A locally derived bias correction factor was used for the 2018 and 2019 results due to the resumption of automatic air quality monitoring at the Chevallier Street site, with a high rate of data capture (99% in 2018 and 98% in 2019).

Paragraph 1.51 of LAQM.TG(16) stated that likely exceedances of the objectives should be assessed in relation to 'the quality of the air at locations which are situated outside of buildings or other man-made structures, above or below ground, and where members of the public are likely to be regularly present'. Building facades of residential properties, schools, hospitals and care homes would all be relevant in terms of long-term annual mean objectives.

Where diffusion tube locations were not representative of annual mean exposure to relevant receptors, the data was distance corrected, where possible, using the Defra Nitrogen Dioxide fall off with distance calculator to estimate the annual mean NO<sub>2</sub> concentration at the façade of the closest property.

#### *Automatic Monitoring*

The automatic monitor located on Chevallier Street (IPS3) used in this assessment is subject to fortnightly routine calibration by an Ipswich Borough Council Environmental Health Officer or Technical Officer. The analyser has also been serviced and the monitoring site audited biannually by Matts Monitors and Ricardo Energy & Environment respectively. The Chevallier Street monitor is co-located with triplicate tubes, numbers 45, 46, and 47 and is in AQMA No.1.

All automatic monitoring data collected is managed by Ricardo Energy & Environment using the same quality control procedures utilised by Defra's national air quality network stations.



These procedures represent best practice and fully meet the requirements set out in LAQM.TG(16).

All collected data is screened and scaled (based on site calibrations) and the final data sets presented within this report have benefitted from a full process of data ratification, including thorough additional data quality checks that include site audits and a ratification process that corrects data for instrument sensitivity drift between routine calibrations.

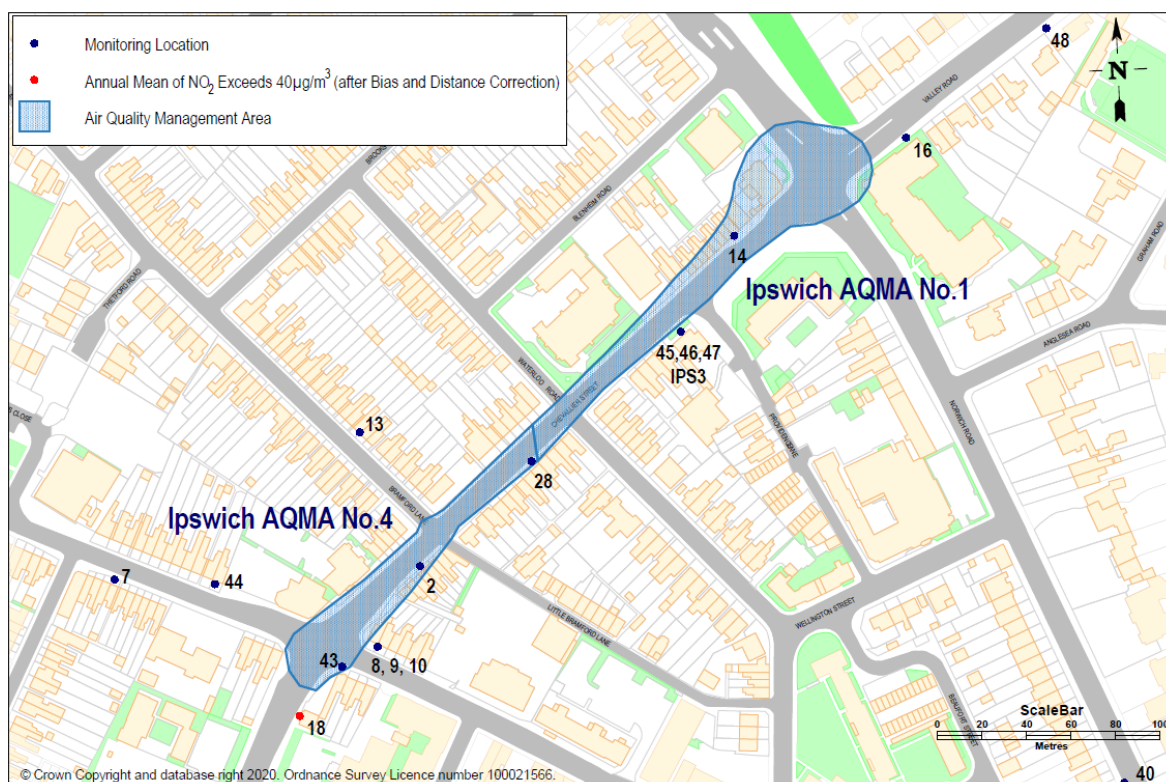
Further details on the QA/QC for the air quality monitoring data can be found in the ASR's, Updating and Screening Assessments and Progress Reports on the Councils website.

### Monitoring Data

The maps and tables below show the monitoring locations and annual mean NO<sub>2</sub> concentrations within AQMAs No. 1, 3 and 4 for the period 2014 – 2019.

#### *AQMA No. 1*

A map detailing the monitoring locations in and around the perimeter of AQMA 1 is shown below:



**Figure 7: Monitoring Locations in and around AQMA 1**

**Table 1: Values of NO<sub>2</sub> at façade for monitoring sites near AQMA 1 (note: IPS3 is a continuous monitoring site)**

Monitoring site	In AQMA	Distance correction required	NO <sub>2</sub> Concentrations (µg/m <sup>3</sup> ) (unadjusted values not located at façade of relevant receptor provided in brackets)					
			2014 - NF	2015 - NF	2016 - NF	2017 - NF	2018 - LF	2019 - LF
IPS3	Y	Did not distance correct monitor data	N/A	N/A	N/A	29	28	26
DT45 (trip)	Y	Y	(29.6)	(29.1)	25.7 (27.4)	25.0 (26.5)	26.5 (28.3)	24.3 (25.7)
DT46 (trip)	Y	Y	(29.3)	(28.4)	25.7 (27.4)	25.0 (26.5)	26.5 (28.3)	24.3 (25.7)
DT47 (trip)	Y	Y	(28.6)	(28.0)	25.8 (27.6)	25.0 (26.5)	26.5 (28.3)	24.3 (25.7)
DT14	Y	Y	<b>45.7</b> <b>(46.7)</b>	<b>46.2</b> <b>(47.8)</b>	<b>45.9</b> <b>(47.4)</b>	<b>43.7</b> <b>(45.1)</b>	<b>43.5</b> <b>(44.5)</b>	39.8 <b>(41.0)</b>
DT16	N	Y	(33.2)	(36.4)	32.2 (35.1)	33.6 (36.7)	32.0 (35.3)	30.3 (33.0)
DT48	N	Y	(27.1)	(27.4)	23.1 (27.1)	24.4 (28.8)	22.5 (26.5)	21.6 (25.0)

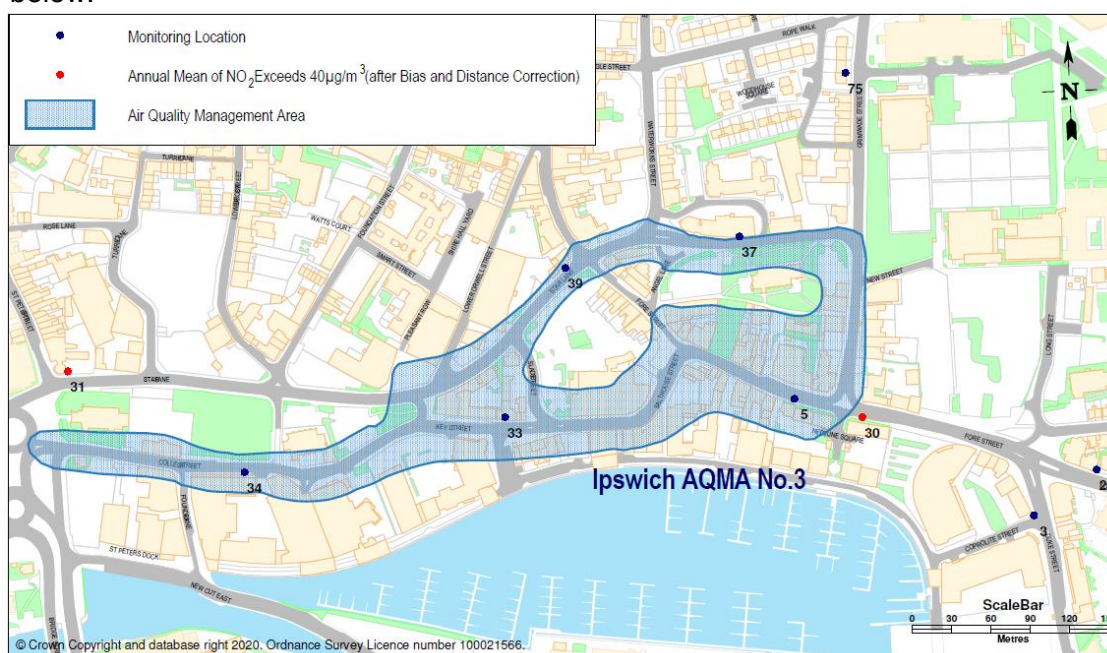
Bias Correction Factor used: NF – National Factor / LF – Local Factor

N/A – no data held

The results show that with the exception of DT14, all monitoring sites have been reading below the relevant objective for the last six years. DT14 is located on a narrow stretch of road, leading up to a roundabout that is often congested, particularly at peak times.

### AQMA No.3

A map detailing the monitoring locations in and around the perimeter of AQMA 3 is shown below:



**Figure 8: Monitoring Locations in and around AQMA 3**

**Table 2: Values of NO<sub>2</sub> at façade for diffusion tube monitoring sites near AQMA 3**

Monitoring Site	In AQMA	Distance correction required	NO <sub>2</sub> Concentrations (µg/m <sup>3</sup> ) (unadjusted values not located at façade of relevant receptor provided in brackets)					
			2014 - NF	2015 - NF	2016 - NF	2017 - NF	2018 - LF	2019 - LF
3	N	N/A	(28.8)	(27.9)	(26.6)	(26.0)	(26.9)	(26.1)
5	Y	Y	(39.8)	39.9 <b>(41.9)</b>	39.1 <b>(41.0)</b>	<b>42.0</b> <b>(44.2)</b>	<b>40.6</b> <b>(42.1)</b>	37.7 (39.0)
29	N	N	29.8	30.9	31.6	33.1	32.1	30.9
30	N	Y	(29.3)	<b>43.3</b> <b>(47.4)</b>	<b>42.1</b> <b>(46.2)</b>	<b>46.3</b> <b>(51.0)</b>	<b>45.5</b> <b>(48.7)</b>	<b>43.0</b> <b>(45.9)</b>
31 (no receptor)	N	N/A	(32.4)	(33.7)	(35.5)	<b>(42.6)</b>	<b>(45.3)</b>	<b>(43.7)</b>
33	Y	N	32.9	32.9	33.0	33.4	34.0	32.1
34	Y	N/A	<b>(41.6)</b>	(38.2)	(37.0)	(39.8)	(38.6)	(32.9)
37	N	N/A 2014-2018  N - 2019	(24.1)	(24.9)	(23.7)	(24.7)	(25.0)	M 31.4
39	Y	N/A 2014-2018  Y - 2019	(38.9)	<b>(42.2)</b>	<b>(40.7)</b>	<b>(42.7)</b>	<b>(42.6)</b>	M 37.0 <b>(41.2)</b>
75	N	N	23.1	25.4	25.4	25.4	25.7	M 21.8

Bias Correction Factor used: NF – National Factor / LF – Local Factor

N/A – unable to distance correct to nearest exposure / no relevant exposure

M = Moved to new Location

Diffusion Tubes 3, 29, 33, 37 and 75 have remained below the relevant objective for the last six years. Diffusion tubes 37, 39 and 75 were relocated in 2019 to enable calculations of relevant exposure; all tubes remained below the objective level (DT75 was located on a building planned to be demolished, hence the relocation to a relevant receptor close to the monitoring site used between 2014-2018).

Although DT31 is above the annual objective level, there is no relevant exposure in the vicinity. Given the closest relevant exposure along St Peters Street is approximately 50 meters away, it is highly unlikely that there will be an exceedance at this location, particularly as traffic volume at this location is known not to be heavy. Furthermore, the Council has confirmed that there are no permanent residents of the Novotel hotel opposite DT31, hence the objective would not apply there. DT34 has continued to experience concentrations within 10% the annual objective level; it has not exceeded the objective level since 2014. Diffusion Tubes 5 and 39 have continued to experience concentrations above, or within 10% of the objective level for the last six years.

Diffusion Tube 30 is located approximately 8 meters outside of the existing AQMA and has remained consistently above the annual mean objective level since 2015. The tube is



located near to a zebra crossing on a three-way junction as can be seen in the photographs below.

***Photographs 1-3: Junction of Fore Street with Grimwade Street (location of DT30 is circled in red)***

Photograph 1 – viewing junction from Fore Street facing West



Photograph 2 – viewing junction from Fore Street facing East

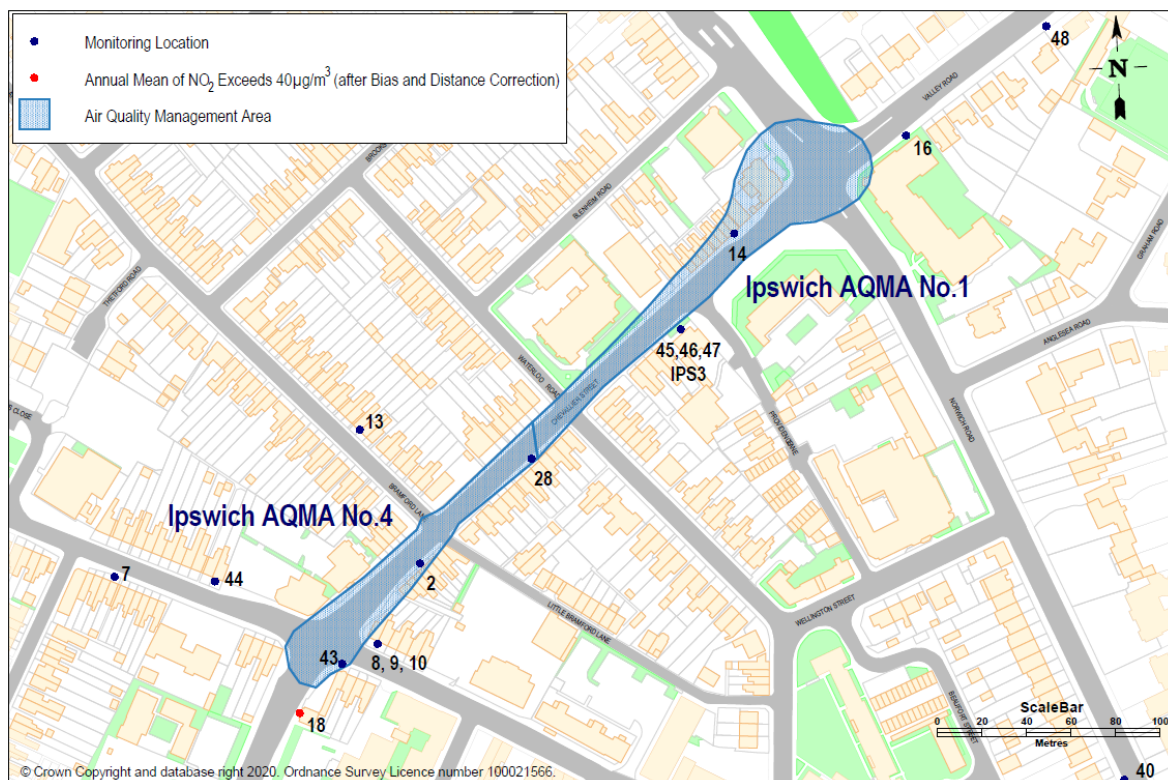


Photograph 3 – viewing junction from Grimwade Street



#### AQMA No.4

A map detailing the monitoring locations in and around the perimeter of AQMA 4 is shown below:



**Figure 9: Monitoring Locations in and around AQMA 4**



**Table 3: Values of NO<sub>2</sub> at façade for diffusion tube monitoring sites near AQMA 4**

Tube	In AQMA	Distance correction required	NO <sub>2</sub> Concentrations (µg/m <sup>3</sup> ) (unadjusted values not located at façade of relevant receptor provided in brackets)					
			2014 – NF	2015 - NF	2016 - NF	2017 - NF	2018 - LF	2019 - NF
2	Y	Y	39.4 <b>(42.5)</b>	37.9 <b>(40.8)</b>	36.6 (39.4)	37.3 <b>(40.2)</b>	38.4 <b>(42.1)</b>	34.4 (37.5)
7	N	N	(32.4)	(32.6)	30.5	31.7	31.1	30.2
8 (trip)	N	Y	(32.7)	(33.7)	29.8 (34.5)	30.1 (35.2)	28.7 (33.6)	27.9 (32.3)
9 (trip)	N	Y	(33.1)	(34.3)	30.4 (35.3)	30.1 (35.2)	28.7 (33.6)	27.9 (32.3)
10 (trip)	N	Y	(32.9)	(33.8)	29.0 (33.5)	30.1 (35.2)	28.7 (33.6)	27.9 (32.3)
13	N	Y	(35.1)	(22.3)	21.8 (23.9)	22.3 (24.6)	21.6 (24.2)	21.1 (23.3)
18	N	N	29.5	29.5	28.4	27.0	28.1	<b>M 40.5</b>
28	Y	Y	(35.2)	(37.1)	31.7 (35.5)	32.2 (36.0)	33.6 (38.3)	30.8 (34.5)
43	Y	Y	(37.0)	39.9 <b>(40.4)</b>	36.7 (37.1)	38.7 (39.1)	37.3 (38.2)	34.7 (35.5)
44	N	Y	(36.7)	(36.6)	30.5 (37.4)	30.7 (37.6)	30.6 (37.6)	28.2 (34.0)

Bias Correction Factor used: NF – National Factor / LF – Local Factor

N/A – no data held

M = Moved to new Location

The results show that all monitoring sites within AQMA No.4, once bias corrected and distance adjusted for relevant exposure, have been reading below the relevant objective for the last six years.

Diffusion tube 18 was relocated to the front of the same residential property in 2019 and experienced a marginal exceedance in the same year. At the time of writing this report, current monitoring results at this location in 2020 indicate that this location will not experience an exceedance of the annual objective level in 2020.

### **Analysis of Trends in NO<sub>2</sub> Monitoring Data**

According LAQM TG.(16), when considering whether to revoke or amend an AQMA, local authorities should consider measurements for several years or more (i.e. three to five years). They should also investigate national trends and local influences that may be affecting the AQMA. The guidance also states that when conducting trend analysis, ideally more than five years' worth of data should be assessed to demonstrate whether trends are statistically significant. The reason for this is because changes in concentrations occur from year to year due to meteorological conditions. Given that the Council has obtained six years of data for most of the monitoring sites used in this review, it can be confident of the findings.

This section considers the trends in annual mean concentrations measured in the period 2014-2019 within AQMAs 1, 3 and 4 against the annual mean objective level of 40µg/m<sup>3</sup>. Figures 10 – 12 present the same information from Tables 1-3 in graphical form.

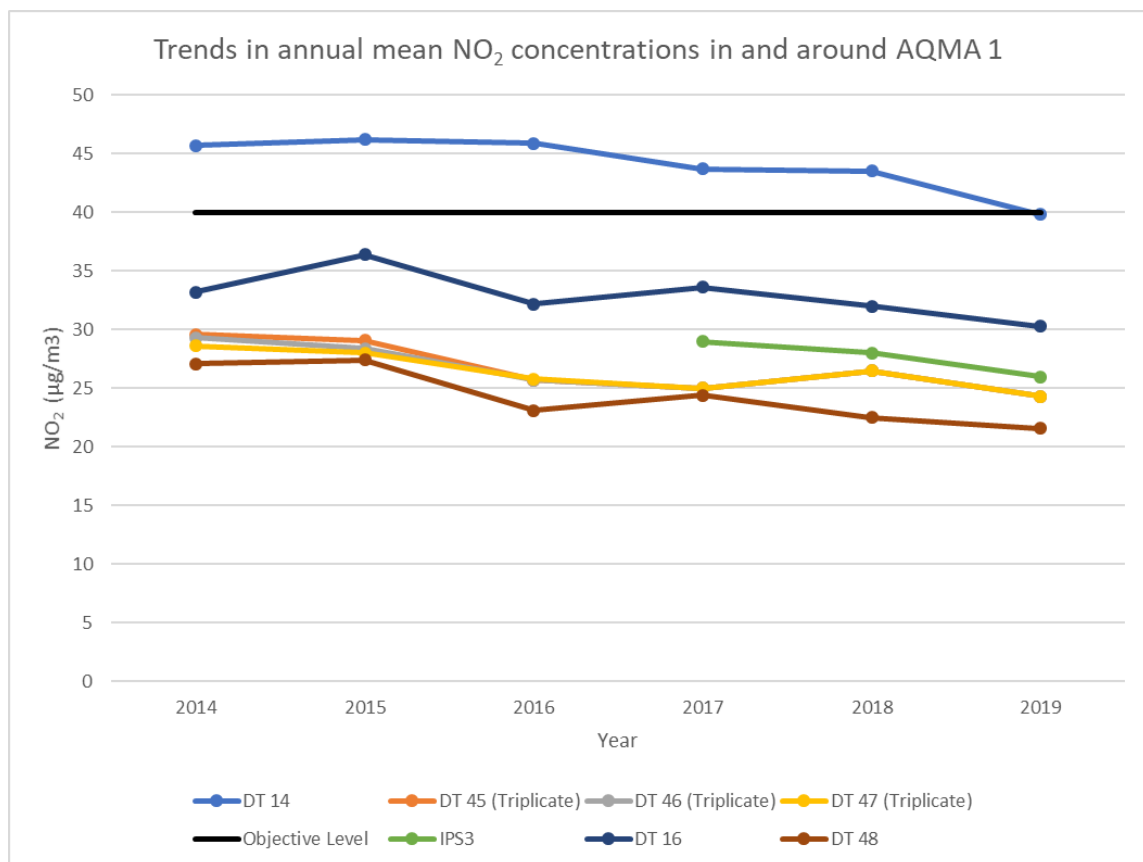
LAQM.TG (16) states that “it can be considered that exceedances of the NO<sub>2</sub> 1-hour objective may occur at roadside sites if the annual mean is above 60µg/m<sup>3</sup>”. From the above tables it is clear that monitoring values at all sites for the last six years are significantly below the annual mean value of 60µg/m<sup>3</sup>. Therefore, the Council does not consider there to be a risk of exceedance of the hourly objective at any site.

#### AQMA No.1 - Trends in NO<sub>2</sub> concentrations

Figure 10 below shows that although concentrations exhibit a small year on year variability, the overall trend is for concentrations to have declined since 2014. With the exception of DT14, once bias and distance corrected, all sites have experienced concentrations below the objective since 2014.

Although DT14 recorded an annual mean of 39.8 µg/m<sup>3</sup> in 2019, the Council is not confident that levels will not exceed the objective in future years. In light of this the AQMA will not be revoked.

However, despite the concerns around DT14 exceeding the objective, the Council concludes that is unlikely that an exceedance of the annual mean objective for NO<sub>2</sub> will occur at other locations within or around the perimeter of AQMA 1 in the foreseeable future. Diffusion tubes 45, 46, and 47 have read under 30µg/m<sup>3</sup> since 2014, and the co-located automatic monitor IPS3 has also read below 30µg/m<sup>3</sup> since its reinstatement in 2017.



**Figure 10: Trends in annual mean NO<sub>2</sub> concentrations in and around AQMA 1**

### AQMA No.3 - Trends in NO<sub>2</sub> concentrations

Figure 11 below shows that within and around AQMA 3, the picture is mixed. Of particular note is DT30 which is located just outside the perimeter of the AQMA. Unfortunately, concentrations at this site have remained about the annual objective level since 2015, with a peak recorded concentration of 46.3 µg/m<sup>3</sup> in 2017 following bias and distance correction.

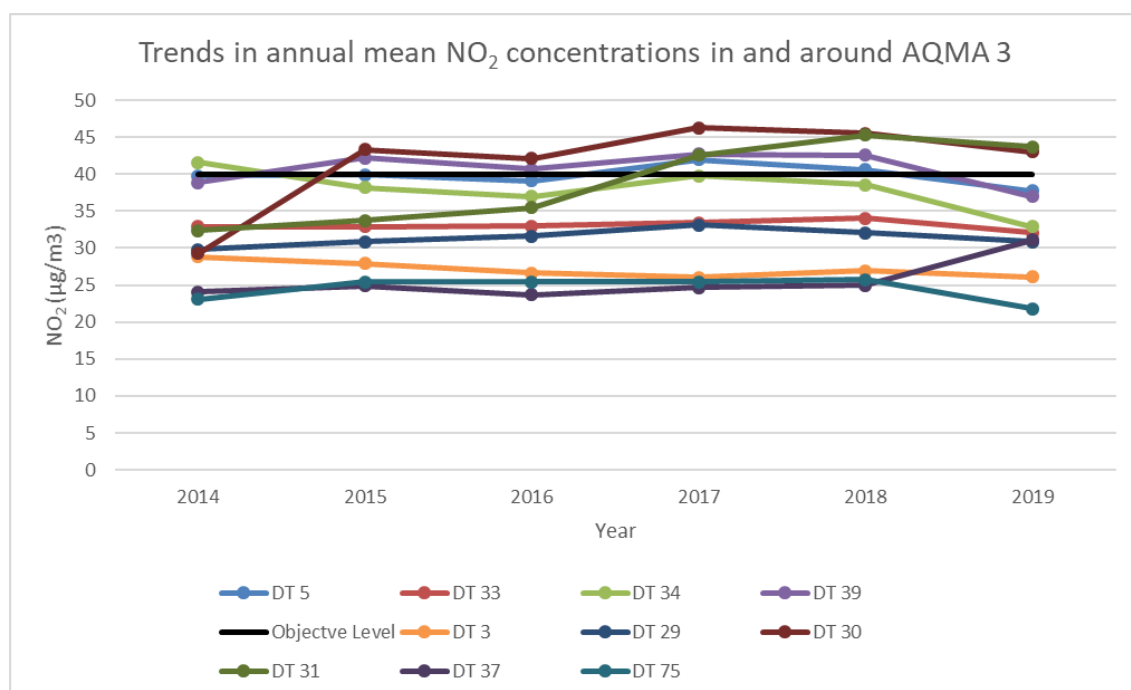
Concentrations at DT5 have varied slightly year on year, although they have essentially remained static since 2014.

Although DT31 is above the annual objective level, with a marginal upward trend, there is no relevant exposure in the vicinity for the purposes of the air quality objectives. DT31 is close to the junction of Star Lane and St Peters Street and was placed in that position to help define the boundary of AQMA 3.

Despite the small year on year variability, there is a marginal downward trend at DT34 since 2014. It should be noted however that the Council are unable to distance correct to the nearest exposure from this location.

Concentrations at DT37 have remained essentially static since 2014 until an increase to 31.4 µg/m<sup>3</sup> in 2019. However, this is likely as a result of the site being moved in 2019 to enable the calculation of relevant exposure.

Concentrations at DT39 have also varied slightly year on year, although they have essentially remained static since 2014. The site was relocated to the opposite side (north-western side) of the Star Lane/Fore Street junction in 2019 to enable the calculation of relevant exposure.

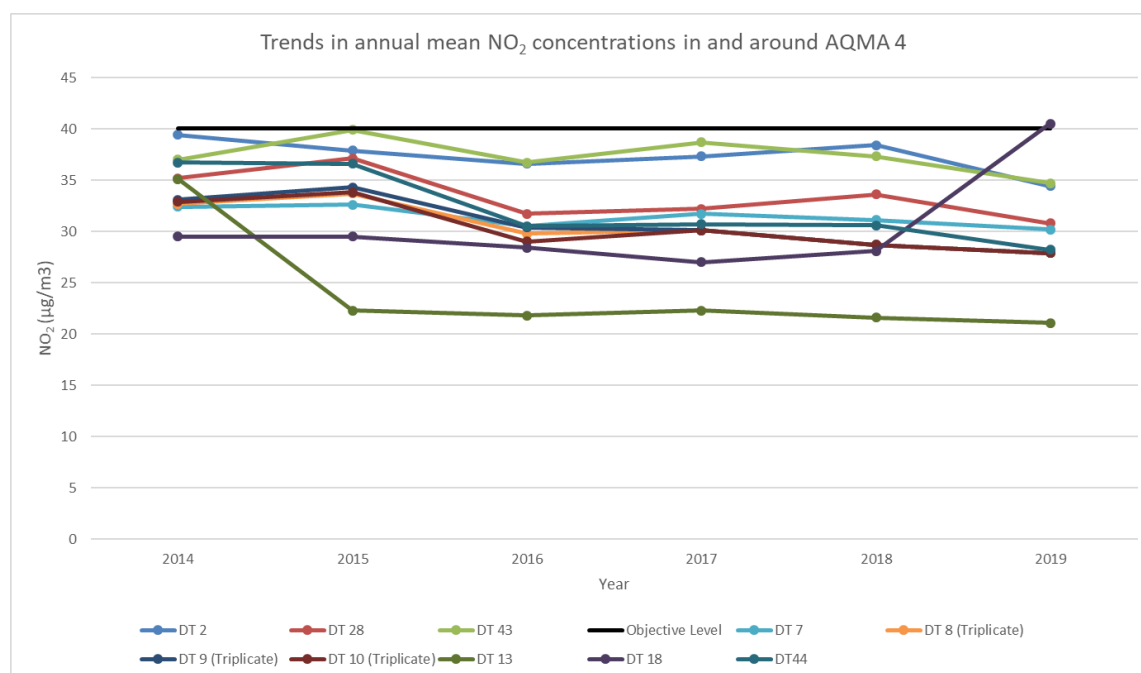


**Figure 11: Trends in annual mean NO<sub>2</sub> concentrations in and around AQMA 3**

## AQMA No.4 - Trends in NO<sub>2</sub> concentrations

Figure 12 below shows a general downward trend over the last six years. Once bias corrected and distance adjusted for relevant exposure, all sites have experienced concentrations below the relevant objective for the last six years. It is therefore concluded that it is very unlikely that an exceedance of the annual mean objective for NO<sub>2</sub> will occur within AQMA 4 in the foreseeable future.

It is recommended that the AQMA No.4 is revoked.



**Figure 12: Trends in annual mean NO<sub>2</sub> concentrations in and around AQMA 4**

Diffusion tube 18 was relocated to the front of the same residential property in 2019 and experienced a marginal exceedance in the same year. At the time of writing this report, current monitoring results at this location in 2020 indicate that this location will not experience an exceedance of the annual objective level in 2020. Given this marginal exceedance, it is unlikely to provide sufficient evidence to fast track a declaration of an AQMA. The Council has discussed this exceedance with the LAQM helpdesk who supported this decision. Additional monitoring at this location is required in order to make an informed decision for the declaration of a new AQMA in line with the guidance for declaration in LAQM. PG(16).

## Setting the AQMA boundaries

Local authorities have a duty under section 83(1) of the 1995 Environment Act to designate those areas where air quality objectives are unlikely to be, or are not being, met as air quality management areas. These areas have to be designated officially by means of an 'order'.

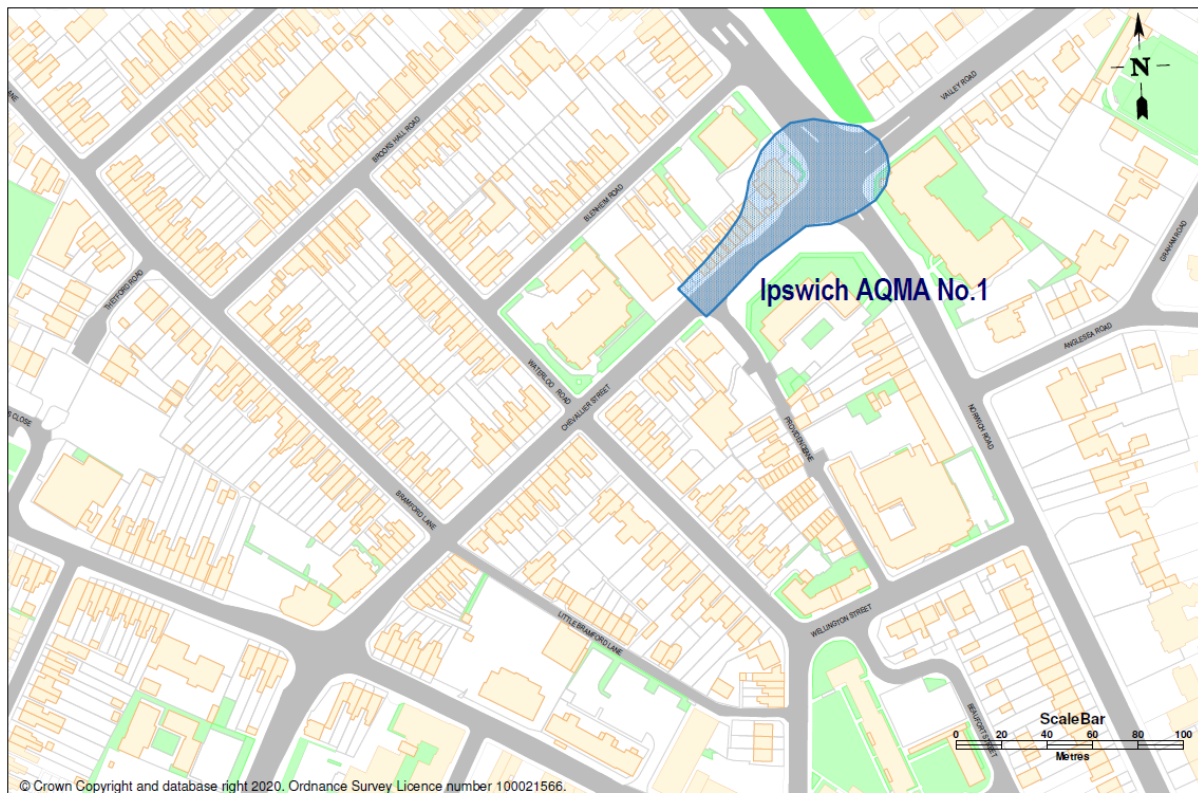
Setting the boundary of an air quality management area involves an element of judgement and can vary from the designation of an isolated property to designation of a whole local authority area. However, the air quality management area must encompass all known and predicted areas of exceedance where there is relevant exposure. The local authority can

base AQMAs on geographical or man-made features or roads rather than individual properties.

Boundaries of AQMAs 1 and 3 are still generally relevant, but there could be some boundary changes where areas within the AQMAs have been found to be achieving the objective levels or objective levels are exceeded at areas outside of the existing AQMAs.

Figures 13 and 14 show the proposed areas to be covered by the amended boundaries to AQMAs 1 and 3 respectively. These have been drawn taking into consideration monitoring locations and traffic flows, and are subject to further consultation with Members of the Council, Suffolk County Council as Highways Authority, and the public. Suffolk County Council Highways has already been consulted to consider the practicalities of the proposed AQMA area with regard action planning and transport. **Suffolk County Council made no comment on this assessment other than they have no funding to review the traffic management arrangements in this area.**

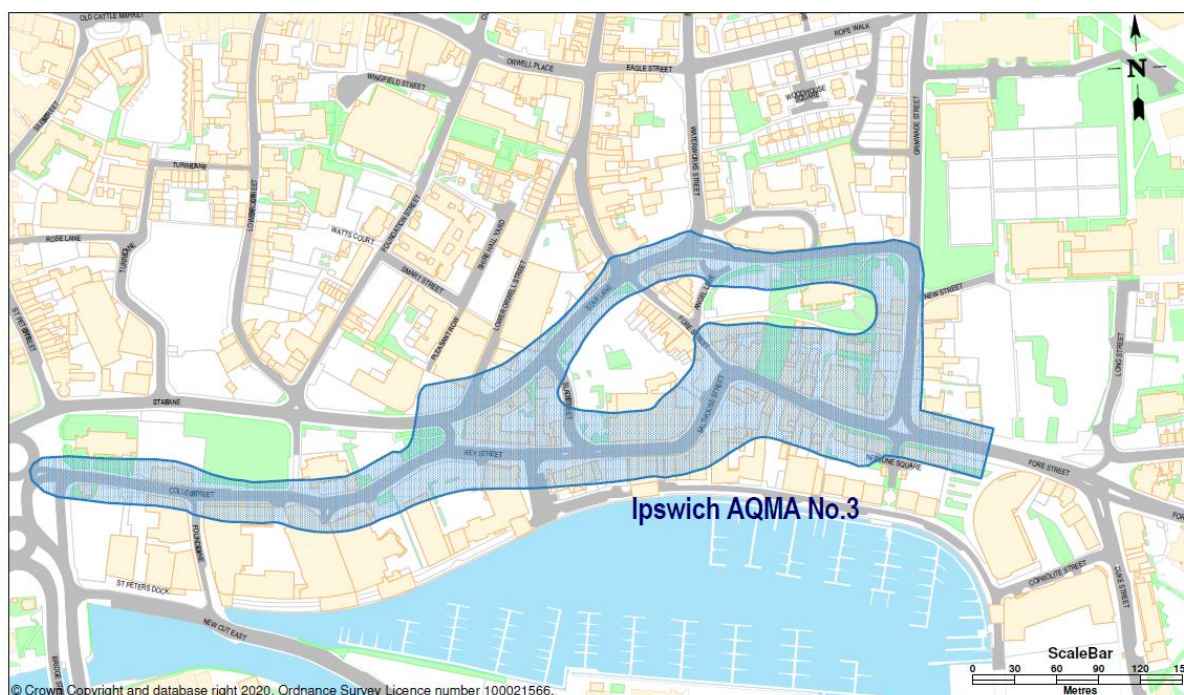
**Figure 13: Recommended area to covered by the amended boundary to AQMA No.1**



Monitoring over the last six years has shown that it is unlikely that there will be exceedances of the nitrogen dioxide annual average objective level on the length of Chevallier Street from the junction with Providence Lane to the southwestern perimeter of the AQMA. The AQMA Order will therefore be amended/varied and reduced in size whilst still covering the current areas of exceedance of the objective level along Chevallier Street and a small area on Norwich Road roundabout.



**Figure 14: Recommended area to be covered by the amended boundary to AQMA No.3**



Due to a persistent exceedance of DT30, it is proposed that the south-eastern boundary of the AQMA is extended to include a further length of Fore Street. The proposed boundary extension will cover additional relevant receptors on the eastern side of the three-way junction between Fore Street and Grimwade Street.

Monitoring results further towards the junction of Fore Hamlet, Back Hamlet and Duke Street (DT3, DT29) have not shown any exceedances of the objective level, so it is not proposed to extend the boundary as far as this junction. Furthermore, DT75 on Grimwade Street has remained below objective level for the last six years so no alterations to the north-eastern boundary are proposed.

It should be noted that there will be some areas within the proposed AQMA that will not be exceeding the annual mean nitrogen dioxide objective level but for the purposes of action planning and administration are included.

Due to NO<sub>2</sub> concentrations remaining below the annual mean objective level for the last six years, it is proposed that AQMA No.4 is revoked.

### **Estimating Population Exposure**

Local authorities are required to estimate the number of people exposed to pollutant concentrations above the objective levels, and the maximum pollutant concentration at a relevant receptor location.

Defra inform that it is the population within the exceedance area that is of interest, and not the population within the AQMA. Total relevant exposure has been estimated within the area using GIS and manual surveys.

Defra inform that Authorities should assume that the residential population is representative of exposure within the exceedance area.

The total population for the area of exceedance in AQMA 1 is estimated to be 25. The maximum pollutant concentration at a relevant receptor location was  $41.0\mu\text{g}/\text{m}^3$  (distance corrected to  $39.8\mu\text{g}/\text{m}^3$ ) in 2019 measured by diffusion tube.

The total population for the area of exceedance in AQMA 3 is estimated to be 191. The population within the proposed AQMAs is greater than this. The maximum pollutant concentration at a relevant receptor location was  $45.9\mu\text{g}/\text{m}^3$  (distance corrected to  $43.0\mu\text{g}/\text{m}^3$ ) in 2019 measured by diffusion tube.

## **Conclusions and Recommendations**

Monitoring of nitrogen dioxide indicates that there are several locations across Ipswich where the annual average objective level for nitrogen dioxide is exceeded. Most of these locations fall within existing AQMAs, but there is a location just outside the scope of AQMA No.3 where it does not. There are areas of the existing AQMA No.1 where monitoring indicates that there is no continuing exceedance of the objective level. Furthermore, monitoring indicates that there is no continuing exceedance of the annual average objective level in AQMA No.4.

The Council view the marginal exceedance of diffusion tube 18 for one year as insufficient evidence for concluding whether to declare a new AQMA at this location. At the time of writing this assessment, it appears that this location will not exceed the annual mean objective level in the year 2020. Additional monitoring at this location is required in order to make an informed decision for the declaration of a new AQMA in line with the guidance for declaration in LAQM. PG(16).

In light of the above, it is recommended that the following actions are taken:

- The boundary of AQMA No. 3 is amended (marginally increased).
- The boundary of AQMA No. 1 is amended (decreased).
- AQMA No. 4 is revoked.

As such, and following approval of this report by Defra, consultation will take place with members of the council, the statutory consultees and the public. Following consultation, and assuming approval of the proposed actions by the local authority Executive, it is recommended that amendments/variations are made to two of the five existing AQMAs, and one AQMA is revoked.

Following any amendment of AQMA No.3, the Council will look to review the current AQAP and establish if there are any additional measures that can be included to help address the additional exceedance at site DT30.

Monitoring will continue within and around the AQMAs, at locations close to exceeding the objective level, or where exceedance has historically occurred. Further changes to the AQMAs will be made as and when required, dependent on the outcome of any Further Assessment and future monitoring or air quality modelling results.