



# South Cambridgeshire District Council 2019 Air Quality Annual Status Report (ASR)

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

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## Signed off by:

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- Cllr Bill Handley – The Cabinet Lead Member for Environment
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## **Executive Summary: Air Quality in our area, South Cambridgeshire District Council**

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

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

South Cambridgeshire District Council (SCDC) is a rural district undergoing a significant growth with new or expanded towns/villages around Cambridge City which the district of South Cambridgeshire encompasses. The area has good road and rail links with London and the South-East. The M11/A11 and A14 corridors pass through the District to the west, south and north of Cambridge respectively.

The A14 is congested on a regular basis between Bar Hill (to the North-West of Cambridge) and Milton (to the North-East). This has resulted in the declaration of an Air Quality Management Area (AQMA) for Nitrogen Dioxide (NO<sub>2</sub>) and Particulate Matter (PM<sub>10</sub>) along this stretch in 2008. These pollutants have been monitored at several locations with both Diffusion Tubes and Automatic monitors. The monitoring results show a decreasing trend in pollution levels and have remained below the national objective levels over the past five years.

Several improvements schemes have been undertaken or are still ongoing on the A14 in recent years. In 2015, improvements between junctions 31 and 32 of the A14 were commenced under the Government's 'Pinch-Point' programme. The scheme involved adding an additional lane for both eastbound and westbound directions.

Since 2017, major improvements works on A14 between Cambridge and Huntingdon have been commenced by Highways England. The scheme is expected to be completed by 2020 and significantly alleviate impacts on local air quality in the management area.

Future major developments are to be largely residential and reliant on road-based transport for travel and commuting to the city, London and the surrounding area. The demand for housing is therefore very high. The majority of the growth is associated with significant developments such as Northstowe (10,000 dwellings) to the North West of Cambridge, Waterbeach Barracks (6000-10,000 dwellings) to the North East of Cambridge, Bourn Airfield and Cambourne West to the West of Cambridge.

Given the scale of the future developments and their potential to introduce new hotspots where air quality could become a concern, the need for a more robust and up to date monitoring network across the district has been acknowledged.

Most of the housing developments within the district benefit from our low background pollution levels. Therefore, individual developments may not show significant impacts on local air quality when subject to detailed modelling. However, it is likely that the cumulative impacts of multiple developments will pose a long-term risk to air quality if no mitigation measures are implemented to maintain our air quality. This is particularly a challenge where local planning policies do not categorically state what measures are required to improve or mitigate impacts on air quality unless national health objectives are exceeded. Therefore, the need for district-wide air quality measures to maintain air quality was acknowledged through a draft Air Quality Strategy last year which is now under review.

Furthermore, our new Local Plan was adopted in September 2018. The new Local Plan gives a further consideration to air quality through a planning condition for major developments across the district. This condition is focused on promotion of sustainable transport measures to reduce the emissions associated with traffic.

## Actions to Improve Air Quality

The challenge of maintaining good air quality in the wider district has been the focus last year. This has been mainly achieved through close partnership with Council Planning and Policy teams, Public Health and Highways England. A summary of main actions taken last year are as follows;

- A Supplementary Planning Document (SPD) on Sustainable Design & Construction is in preparation to support the new Local Plan. Efforts have been made to ensure that air quality requirements are included in this SPD to support the developers with planning applications. These requirements include measures to promote sustainable and low emission transport, behavioral change schemes, modal shifts and support for low emission public transport.
- Efforts have been made to secure implementation of low emission deliverables through planning conditions and Site-Specific Supplementary Planning Documents for major developments such as Waterbeach New Town and Bourn Airfield.
- A new monitor for PM2.5 (Particulate Matters) was installed at Orchard Park School near the A14 and will be operational in summer 2019. This was achieved through a partnership with Highways England and will form a new initiative to monitor air quality at schools near major roads.

## Conclusions and Priorities

The review of the monitoring data in 2018 has identified the following:

- The objectives for Nitrogen Dioxide and Particulates were met at all monitoring locations (three continuous and 27 passive monitoring sites) with good data capture. The overall data indicates a general improvement of air quality since 2016.
- The monitoring data relating to the AQMA also achieved relevant objectives.
- We have undertaken diffusion tube monitoring around the Northstowe New Town since June 2016. The monitoring results are presented in this report for the first time. No exceedances above objective levels were recorded.
- Five additional diffusion tubes were introduced to the monitoring network with regards to ongoing or future developments. The results are below objective levels.
- No new sources of pollution have been identified.

### Priorities:

- Implementation of practical low emission measures for major developments district wide.
- Review and update of the monitoring network to ensure wider area of the district is covered.
- Review of the status of AQMA and its revocation as recommended by Defra (due to consistent compliance with objective levels).
- Continue to monitor pollution levels along A14 during the improvements works.



## Local Engagement and How to get involved

Details and reports of Air Quality Service are available on our website for public. Share your views and concerns via email address [air.quality@scambs.gov.uk](mailto:air.quality@scambs.gov.uk) and follow our Facebook page<sup>6</sup> for general updates and news.

Do your share to improve air quality in South Cambridgeshire by:

- Avoid using your car for short trips (under 2 miles) - short trips are very polluting as modern engines need to reach a very high temperature to work efficiently.
- Try using public transport, cycling or walking more often.
- Walking and cycling help you to stay healthy plus save you money in fuel costs.
- Switch it off - turn off your engine if you are caught in a traffic jam or have to wait at level crossings; not only will this reduce your emission but you will save fuel too.
- When driving, use techniques that help you use less fuel.
- You could use 10% less fuel and save money by following the tips on the AA website.
- Consider using an alternative fuel vehicle - There is a growing market for electric vehicles.
- Consider living car free.
- Join a car club.
- Use journey-planning apps such as 'MyBusTrip' or 'MotionMap' for travel by bus, train, walking and cycling.
- Consider working at home occasionally or car sharing.
- Use less energy at home – wood, coal, oil and gas burning all add to air pollution.
- Make your children aware of the impact that day to day activities have on air quality.
- The 'Kidz 4 Clean Air' website has puzzles, games and information about air quality for children (<http://www.clean-air-kids.org.uk/>).

## Local Air Quality Management

This report provides an overview of air quality in South Cambridgeshire District Council during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives.

This Annual Status Report (ASR) is an annual requirement showing the strategies employed by South Cambridgeshire to improve air quality and any progress that has been made.

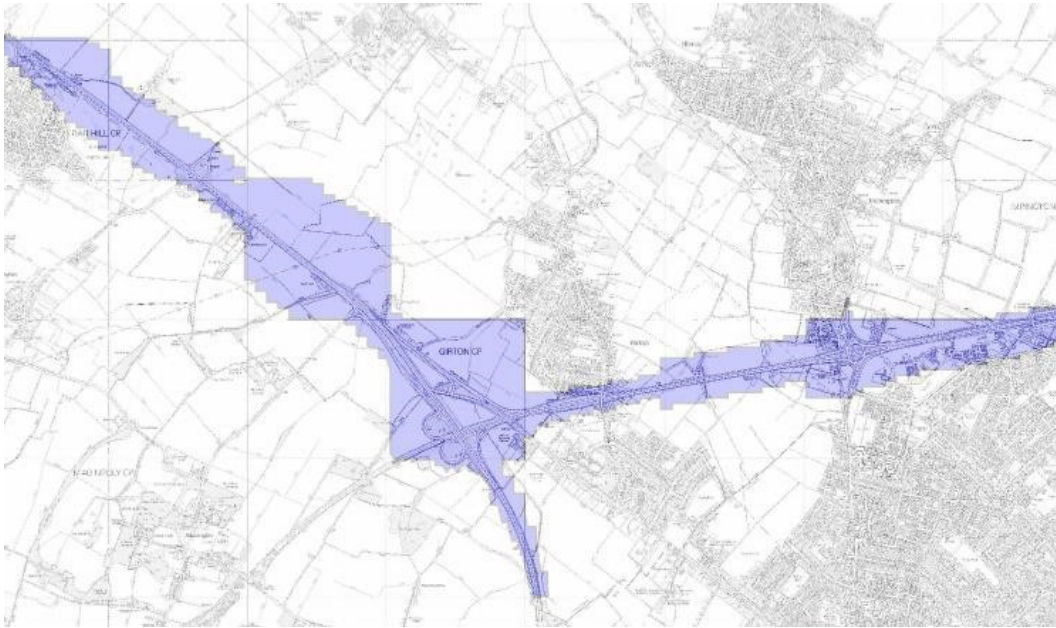
The statutory air quality objectives applicable to LAQM in England can be found in Table E.1 in Appendix E.

## Actions to Improve Air Quality

### Air Quality Management Areas

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

A summary of AQMAs declared by South Cambridgeshire can be found in Table 2.1. Further information related to declared AQMA, including maps of AQMA boundaries are available on our website.



**Figure 1 – Map to show the Air Quality Management Area**

For reference, a map of South Cambridgeshire’s monitoring locations is available in Appendix D.

## Declared Air Quality Management Areas

| AQMA Name        | Date of Declaration | Pollutants and Air Quality Objectives | City / Town        | One Line Description | Is air quality in the AQMA influenced by roads controlled by Highways England? | Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure) |             |     |             | Action Plan   |                     |      |
|------------------|---------------------|---------------------------------------|--------------------|----------------------|--|---|-------------|-----|-------------|---|---------------------|------|
|                  |                     |                                       |                    |                      |  | At Declaration  |             | Now |             | Name  | Date of Publication | Link |
| AQMA 1 (Revoked) | 2007                | NO2 Annual Mean                       | Bar Hill to Milton | Area along A14       | Yes  | 42  | µg/m3       | Nil | Nil         | Nil   | Nil                 | Nil  |
| AQMA 1           | 2008                | NO2 Annual Mean                       | Bar Hill to Milton | Area along A14       | Yes  | 42  | µg/m3       | 19  | µg/m3       | Air Quality Action Plan for Cambridgeshire              | 2009                |      |
| AQMA1            | 2008                | PM10 Daily Mean                       | Bar Hill to Milton | Area along A14       | Yes  | 52  | Exceedances | 1   | Exceedances | Air Quality Action Plan for Cambridgeshire Growth Areas | 2009                |      |

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

## Progress and Impact of Measures to address Air Quality in South Cambridgeshire District Council

Defra's appraisal of last year's ASR concluded that WE should review the current monitoring programme and redistribute resources where sites have consistently demonstrated compliance well below objective levels. Defra has also concluded that there is no evidence that the AQMA status should continue to be retained since no exceedances of objective levels have occurred within the AQMA since 2013 and recommended that AQMA should be considered for revocation. Defra's recommendations have been acknowledged and the following actions have been taken;

- New diffusion tubes were included in the monitoring network in relation to ongoing or future developments.
- Diffusion tube monitoring was undertaken at Northstowe New Town. The data for these tubes are available since June 2016 and is presented in this report for the first time.
- A new PM<sub>2.5</sub> automatic monitor has been installed at Orchard Park School near the A14 and expected to be operational in summer 2019.
- It was acknowledged that the monitored levels within the AQMA have been in compliance with the objective levels over the past five years. We will therefore review the revocation of the AQMA as recommended by Defra but will continue to monitor air quality in this area until the A14 improvements works are completed.

In addition, a further review of the monitoring network and a survey to identify new hotspots will be undertaken to ensure the wider area of the district is monitored.

South Cambridgeshire has taken forward a number of measures during the current reporting year of 2018 in pursuit of improving and maintaining good air quality in wider district.

A new Supplementary Planning Document (SPD) on Sustainable Design & Construction is in preparation to support our new Local Plan. Air quality requirements have been included in this SPD to support the major developments across the district through planning process. These requirements include detailed measures to minimise the impact of the developments on local air quality through sustainable and low emission transport, behavioural change schemes and support for low emission public transport.

Efforts have been made to secure implementation of low emission measures and deliverables through planning conditions and Site Specific Supplementary Planning Documents (SPDs) for developments such as Waterbeach New Town and Bourn Airfield.

A new monitor for PM<sub>2.5</sub> (Particulate Matters) was installed at Orchard Park School near the A14 and is expected to be operational in summer 2019. This was achieved through partnership with Highways England and forms a new initiative to monitor actual exposure levels at schools near major roads.

Other key measures relate to the completion of major highway improvements along the AQMA. Although it is acknowledged that the key driver in these aspects has been other factors rather than air quality alone. Details of all measures completed, in progress or planned are set out in the Progress on Measures to Improve Air Quality table.

## Progress on Measures to Improve Air Quality

| No. | Measure  | EU Category  | EU Classification   | Organisations involved and funding source | Planning Phase | Implementation Phase | Key Performance Indicator   | Reduction in Pollutant / Emission from Measure | Progress to Date  | Estimated / Actual Completion Date |
|-----|--|--|---|---|----------------|----------------------|---|--|---|------------------------------------|
| 1   | Low Emission Strategies                        | Policy Guidance and Development Control, Alternatives to private vehicle use | Promotion of Sustainable Transport, Car clubs, cycling, etc.            | Developers Contributions                  | 2018 – 2019    | 2018 – 2019          | To be confirmed – May involve ratio of PPs issued with LES  | N/A  | In progress   | N/A                                |
| 2   | Guided Bus Way                                 | Transport Planning and Infrastructure  | Bus Route Improvements  | Cambridgeshire County Council             | 2009 – 2010    | 2011                 | N/A   | None   | Completed   | N/A                                |
| 3   | A14 improvement – junction 31 – 32 (E/B & W/B) | Traffic Management   | Strategic highway improvements  | Cambridgeshire County Council             | N/A            | 2015                 | N/A   | None   | Completed Autumn 2015   | N/A                                |
| 4   | A14 / M11 Re-alignment                         | Traffic Management   | Strategic highway improvements  | Cambridgeshire County Council             | N/A            | 2016 – 2020          | Central Government / Highways England Commitment  | None   | Work to commence 2016 / 2017 (Package 1)  | 2020                               |
| 5   | Policy Guidance and Development Control        | Policy Guidance and Development Control                                      | Air Quality Planning and Policy Guidance                                | South Cambridgeshire District Council     | 2015           | 2016                 | LDF Policy NE/16  | None   | SPD or Developers Guide for Low Emission Strategy measures  | 2016                               |
| 6   | City Deal                                      | Transport Planning and Infrastructure<br><br>Promoting Travel Alternatives   | Bus route improvements and promotion of cycling / sustainable transport | Cambridgeshire City and County Council    | 2015 – 2030    | 2016                 | Connect existing and new residential and employment areas with high quality public transport networks, including new orbital bus routes around Cambridge & comprehensive network of pedestrian and cycle route. | None   | Proposed scheme for making bus, cycle and walking journeys more convenient and safer from Northstowe announced. | Tranche 1 schemes by 2019          |

## Local Authority Approach to Reducing Emissions and/or Concentrations

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

South Cambridgeshire District Council undertakes monitoring for PM<sub>2.5</sub> on Huntingdon Road. The PM<sub>2.5</sub> concentrations monitored at Girton site were slightly higher than that predicated by Defra in 2018 confirming an area affected by traffic.

Additional monitoring of PM<sub>2.5</sub> was considered and a new monitor was installed at Orchard Park School near the A14. The aim of this initiative is to monitor the actual levels of exposure for most sensitive receptors near major roads. The monitor is expected to be operational in summer 2019.

We have participated in the publicity campaigns to provide information about impacts of wood burning, what type of wood to burn and how to burn it efficiently by Defra. The information is available online<sup>9</sup>. Furthermore, a publicity campaign about traffic idling near schools is anticipated for Clean Air Day next year.

County Council elected members have noted the impacts of poor air quality and have passed a resolution to work with its partner councils and other public bodies towards promoting a programme of active participation across Cambridgeshire to address air pollution more collaboratively, including the development of communication resources, training and learning events, guidance for communities on air quality monitoring, and collaborative working.

The Greater Cambridgeshire Partnership's Greenways project<sup>10</sup> aims to establish a high-quality network of twelve separate routes into Cambridge from surrounding towns and villages. It involves high quality network of routes from South Cambridgeshire into Cambridge city which aims to increase the level of safe cycling and walking in order to reduce traffic congestion as the city grows.



The Public Health England (PHE) provides the government, local government, the NHS and the public with evidence-based professional, scientific expertise and support. They have included a specific health indicator relating to fine particulate matter within the Public Health Outcomes Framework (PHOF). It is called the fraction of all-cause mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter, PM<sub>2.5</sub>). This was reported as 5.3% for Cambridgeshire in 2016.

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

### **Summary of Monitoring Undertaken**

South Cambridgeshire District Council operates Automatic Monitoring Stations at three sites and undertakes non-automatic (passive) monitoring of NO<sub>2</sub> at 27 sites within the District. Automatic Monitoring Stations are located at Orchard Park (Cambridge), Girton and Impington. All stations monitor PM<sub>10</sub> and NO<sub>2</sub>. Girton site also measures PM<sub>2.5</sub>.

### **Automatic Monitoring Sites**

This section sets out what monitoring has taken place and how it compares with objectives. The Automatic Monitoring Stations at Girton and Impington sites are representative of nearby receptors. The Orchard Park monitor is a background site located within the school grounds. Both Orchard Park and Impington site are located within the Air Quality Management Area for NO<sub>2</sub> and PM<sub>10</sub>.

Data capture for NO<sub>2</sub> was 98% for Impington site, 97% for Orchard Park and 95% for Girton site. Orchard Park and Impington sites achieved 92% for PM<sub>10</sub>. Girton site achieved 91% for PM<sub>10</sub> and 92% for PM<sub>2.5</sub>.

The monitoring results show that:

- No exceedances of annual mean objective for NO<sub>2</sub> or PM<sub>10</sub> was recorded
- No exceedances of annual mean objective for PM<sub>2.5</sub> was recorded
- The hourly mean objective for NO<sub>2</sub> hourly mean was achieved at all sites
- The daily mean objective for PM<sub>10</sub> was achieved at all sites

Table A.1 in Appendix A shows the details of the sites. Maps showing the location of the monitoring sites are provided in Appendix D. Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

## Non-Automatic Monitoring Sites

WE undertook non- automatic (passive) monitoring of NO<sub>2</sub> at 27 sites during 2018. The monitoring network was subject to some changes as follows;

- DT3 and DT16 were withdrawn from the network due to dangerous access.
- DT6 in Linton and DT8 in Harston were relocated and renamed as DT-6N and DT-8N respectively to represent a roadside location with relevant exposure.
- New diffusion tubes were added to the network to improve the monitoring area with regards to future and ongoing developments. These include DT-28N on Cambridge road in Milton, DT-30N on Denny road in Waterbeach and DT-32N on Ely road A10.

In addition, we have commenced a monitoring programme for the Northstowe New Town since June 2016. Diffusion tubes results are presented in this report for the first time. These tubes are labelled as DT-LN (1 to 5).

Table A.2 in Appendix A shows the details of the sites. Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. “annualisation” and/or distance correction), are included in Appendix C.

## Individual Pollutants

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

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

Data capture was over 75% for all diffusion tubes except for DT10, DT18 and DT32N with 42%, 50% and 58% respectively. The low data capture was due to missing tubes for DT10 and dangerous access for DT18. DT32N was added to the monitoring network in April. The results for these tubes were subject to annualisation according to Technical Guidance LAQM.TG16 (Box 7.9).

Following National Bias Adjustment, results for all diffusion tubes remain below the annual mean objective for Nitrogen Dioxide (NO<sub>2</sub>). Table A.3 in Appendix A compares the ratified and adjusted monitored NO<sub>2 annual</sub> mean concentrations for the past 5 years with the air quality objective of 40µg/m<sup>3</sup>.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in

Appendix B. Table A.4 in Appendix A compares the ratified continuous monitored NO<sub>2</sub> hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m<sup>3</sup>, not to be exceeded more than 18 times per year.

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

No exceedances above objective limits have been recorded. Table A.5 in Appendix A compares the ratified continuous monitored PM<sub>10</sub> daily mean concentrations for the past 5 years with the air quality objective of 50µg/m<sup>3</sup>, not to be exceeded more than 35 times per year.

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

Monitored levels remain below the objective levels. Table A.6 in Appendix A presents the ratified and adjusted monitored PM<sub>2.5</sub> annual mean concentrations for the past 5 years.

## Monitoring Results

### Details of Automatic Monitoring Sites

| Site ID | Site Name                         | Site Type        | X OS Grid Reference | Y OS Grid Reference | Pollutants Monitored   | In AQMA? | Monitoring Technique        | Distance to Relevant Exposure (m) [1]. | Distance to curb of nearest road (m) [2]. | Inlet Height (m) |
|---------|-----------------------------------|------------------|---------------------|---------------------|--|----------|-----------------------------|--|---|------------------|
| IMP     | Impington (A14)                   | Roadside         | 543739              | 261625              | NO <sub>x</sub> (NO <sub>2</sub> )<br>PM <sub>10</sub>                     | Yes      | ET M200E<br>/ ET<br>BAM1020 | Y (12 m)                               | 2   | 2                |
| ORCH    | Orchard Park Primary School (A14) | Urban Background | 544558              | 261579              | NO <sub>x</sub> (NO <sub>2</sub> )<br>PM <sub>10</sub>                     | Yes      | ET M200E<br>/ ET<br>BAM1020 | Y (1 m)                                | N/A                                       | 2                |
| GIRT    | Girton                            | Roadside         | 542676              | 260667              | NO <sub>x</sub> (NO <sub>2</sub> )<br>PM <sub>10</sub><br>PM <sub>25</sub> | No       | ET M200E<br>/ ET<br>BAM1020 | Y (5 m)                                | 5   | 2                |

#### Notes:

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

[2] N/A if not applicable.

## Details of Non-Automatic Monitoring Site

| Site ID | Site Name                             | Site Type        | X OS Grid Reference | Y OS Grid Reference | Pollutants Monitored | In AQMA? | Monitoring Technique | Distance to Relevant Exposure (m) [1]. | Distance to curb of nearest road (m) [2]. | Height (m) |
|---------|---------------------------------------|------------------|---------------------|---------------------|----------------------|----------|----------------------|--|---|------------|
| DT1     | 1 Coppice, Histon                     | Urban            | 544230              | 262048              | NO2                  | No       | 7 m                  | 0.5 m                                  | No  | 2          |
| DT2     | The Gables, High Street, Histon       | Background       | 543770              | 263678              | NO2                  | No       | 5m                   | 1m                                     | No  | 2          |
| DT3     | Hill Farm                             | Roadside         | 536926              | 264956              | NO2                  | Yes      | N/A                  | 4m                                     | No  | 2          |
| DT4     | Cottages, A14                         | Roadside         | 548600              | 249136              | NO2                  | No       | 5m                   | 1m                                     | No  | 2          |
| DT5     | 96 High Street, Sawston               | Urban Background | 538744              | 263640              | NO2                  | Yes      | 1m                   | 33m                                    | No  | 2          |
| DT6     | Rhadegund Farm Cottage, Bar Hill, A14 | Roadside         | 556179              | 246815              | NO2                  | No       | 7m                   | 0.5m                                   | No  | 2          |
| DT7     | 64 High Street, Linton                | Roadside         | 528131              | 247399              | NO2                  | No       | 10m                  | 2m                                     | No  | 2          |
| DT8     | 20 High Street, Tadlow                | Roadside         | 542554              | 251002              | NO2                  | No       | 5m                   | 1m                                     | No  | 2          |
| DT9     | 47 High Street, Harston               | Urban Background | 547452              | 263175              | NO2                  | No       | 5m                   | 1m                                     | No  | 2          |
| DT10    | 3 Garner Close, Milton                | Urban Background | 542537              | 261467              | NO2                  | Yes      | 15m                  | 1m                                     | No  | 2          |
| DT11    | 1A Weavers Field, Girton              | Urban Background | 544034              | 244585              | NO2                  | No       | 10m                  | 1m                                     | No  | 2          |
| DT12    | Heath House, A505, Thriplow           | Urban Background | 544119              | 261862              | NO2                  | Yes      | 7m                   | 0.5m                                   | No  | 2          |
| DT13    | Lone Tree                             | Roadside         | 543955              | 263588              | NO2                  | No       | 2m                   | 1m                                     | No  | 2          |
| DT14    | Avenue, Impington                     | Urban Background | 544050              | 263306              | NO2                  | No       | 2m                   | 0.5m                                   | No  | 2          |
| DT15    | 72 Cambridge Road, Impington          | Urban Background | 544243              | 261819              | NO2                  | Yes      | 7m                   | 0.5m                                   | No  | 2          |
| DT16    | Hackers Fruit Farm, A14               | Roadside         | 539846              | 262826              | NO2                  | Yes      | 5m                   | 12m                                    | No  | 2          |
| DT17    | 5 Mill Lane, Sawston                  | Roadside         | 548545              | 249366              | NO2                  | No       | 15m                  | 1m                                     | No  | 2          |
| DT18    | 1 Catchall Farm, Cottages, A14        | Roadside         | 540509              | 262290              | NO2                  | Yes      | 1m                   | 10m                                    | No  | 2          |

| Site ID | Site Name                    | Site Type        | X OS Grid Reference | Y OS Grid Reference | Pollutants Monitored | In AQMA? | Monitoring Technique | Distance to Relevant Exposure (m) [1]. | Distance to curb of nearest road (m) [2]. | Height (m) |
|---------|------------------------------|------------------|---------------------|---------------------|----------------------|----------|----------------------|--|---|------------|
| DT19    | Crafts Way, Bar Hill         | Roadside         | 538472              | 263675              | NO2                  | No       | 15m                  | 1m                                     | No  | 2          |
| DT20    | Chieftain Way, Orchard Park  | Roadside         | 544828              | 261738              | NO2                  | Yes      | 1m                   | 0.5m                                   | No  | 2          |
| DT21    | Neal Drive, Orchard Park     | Roadside         | 545056              | 261784              | NO2                  | Yes      | 1m                   | 0.5m                                   | No  | 2          |
| DT22    | Flack End, Orchard Park      | Roadside         | 545435              | 261906              | NO2                  | Yes      | 2m                   | 35m                                    | No  | 2          |
| DT23a   | Orchard Park                 | Urban Background | 544557              | 261571              | NO2                  | Yes      | 1m                   | 50m                                    | Yes                                       | 2          |
| DT23b   | School                       | Urban Background | 544557              | 261571              | NO2                  | Yes      | 1m                   | 50m                                    | Yes                                       | 2          |
| DT23c   | Orchard Park                 | Urban Background | 544557              | 261571              | NO2                  | Yes      | 1m                   | 50m                                    | Yes                                       | 2          |
| DT26    | School                       | Roadside         | 543768              | 263708              | NO2                  | Yes      | 1.5m                 | 2.6m                                   | No  | 2          |
| DT27    | Orchard Park                 | Urban Background | 545259              | 261873              | NO2                  | Yes      | 5m                   | 4.5m                                   | No  | 2          |
| DT28    | School                       | Roadside         | 545169              | 261764              | NO2                  | Yes      | 4.2m                 | 0.2m                                   | No  | 2          |
| DT29    | Co-op, High                  | Urban Background | 552961              | 249251              | NO2                  | No       | 14m                  | 2.0m                                   | No  | 2          |
| DT-6N   | Street, Histon               | Roadside         | 555942              | 246680              | NO2                  | No       | 1m                   | 2m                                     | No  | 2          |
| DT-8N   | 47 High Street, Harston      | Roadside         | 542555              | 251001              | NO2                  | No       | 5m                   | 2m                                     | No  | 2          |
| DT-28N  | 73 Cambridge Road, Milton    | Roadside         | 547436              | 262295              | NO2                  | No       | 10m                  | 2m                                     | No  | 2          |
| DT-30N  | 63, Denny End Rd, Waterbeach | Roadside         | 549154              | 266006              | NO2                  | No       | 5m                   | 2m                                     | No  | 2          |
| DT-32N  | Banworth, Ely Road, A10      | Roadside         | 548742              | 264698              | NO2                  | No       | 10m                  | 2m                                     | No  | 2          |
| DT-LN1  | Old Railway Tavern           | Roadside         | 539847              | 268169              | NO2                  | No       | 5m                   | 1m                                     | No  | 2          |

| Site ID | Site Name              | Site Type | X OS Grid Reference | Y OS Grid Reference | Pollutants Monitored | In AQMA? | Monitoring Technique | Distance to Relevant Exposure (m) [1]. | Distance to curb of nearest road (m) [2]. | Height (m) |
|---------|------------------------|-----------|---------------------|---------------------|----------------------|----------|----------------------|--|---|------------|
| DT-LN2  | 75 High St Longstanton | Roadside  | 539570              | 266842              | NO2                  | No       | 2m                   | 1m                                     | No  | 2          |
| DT-LN3  | 1 Rampton Drift        | Roadside  | 540553              | 266869              | NO2                  | No       | 5m                   | 1m                                     | No  | 2          |
| DT-LN4  | 37 Longstanton         | Roadside  | 540963              | 264474              | NO2                  | No       | 5m                   | 1m                                     | No  | 2          |
| DT-LN5a | Longstanton bypass     | Roadside  | 539614              | 267484              | NO2                  | No       | 20m                  | 1m                                     | No  | 2          |
| DT-LN5b | Longstanton bypass     | Roadside  | 539614              | 267484              | NO2                  | No       | 20m                  | 1m                                     | No  | 2          |
| DT-LN5c | Longstanton bypass     | Roadside  | 539614              | 267484              | NO2                  | No       | 20m                  | 1m                                     | No  | 2          |

**Notes:**

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

[2] N/A if not applicable.

## Annual Mean NO<sub>2</sub> Monitoring Results

| Site ID | Site Type        | Monitoring Type | Valid Data Capture for Monitoring Period (%) [1]. | Valid Data Capture 2018 (%) [2]. | NO2 Annual Mean Concentration (µg/m3) [3]. |      |      |       |       |
|---------|------------------|-----------------|---|----------------------------------|--|------|------|-------|-------|
|         |                  |                 |   |                                  | 2014                                       | 2015 | 2016 | 2017  | 2018  |
| IMP     | Roadside         | Automatic       | 98  | 98                               | 23   | 22   | 23   | 23    | 19    |
| ORCH    | Urban Background | Automatic       | 97  | 97                               | 19   | 18   | 18   | 18    | 14    |
| GIRT    | Roadside         | Automatic       | 95  | 95                               | 25   | 24   | 23   | 23    | 18    |
| DT1     | Urban Background | Tube            | 100   | 100                              | 18.9                                       | 17.4 | 21.3 | 17.2  | 14.7  |
| DT2     | Roadside         | Tube            | 100   | 100                              | 31.5                                       | 30.6 | 27.8 | 27.4  | 27.1  |
| DT3     | Roadside         | Tube            | 0   | 0                                | 31.8                                       | 29.8 | 27.6 | 26.5* | NA    |
| DT4     | Urban Background | Tube            | 100   | 100                              | 28.3                                       | 23.8 | 26.6 | 26.1  | 24.7  |
| DT5     | Roadside         | Tube            | 92  | 92                               | 21.7                                       | 19   | 20.6 | 16.2  | 19.4  |
| DT6     | Roadside         | Tube            | 0   | 0                                | 31.1                                       | 27.4 | 27.9 | 29.2* | N/A   |
| DT7     | Roadside         | Tube            | 75  | 75                               | 11.9                                       | 10.4 | 11.8 | 12.1  | 8.6   |
| DT8     | Urban Background | Tube            | 0   | 0                                | 28   | 28.4 | 28.6 | 27.3* | NA    |
| DT9     | Urban Background | Tube            | 92  | 92                               | 17.3                                       | 16.4 | 17.8 | 17.5  | 14.4  |
| DT10    | Urban Background | Tube            | 42  | 42                               | 30.5                                       | 26   | 26.2 | 26.3  | 25.8* |
| DT11    | Urban Background | Tube            | 100   | 100                              | 28.2                                       | 26.1 | 26   | 24.6  | 24.9  |
| DT12    | Roadside         | Tube            | 92  | 92                               | 21.1                                       | 17.9 | 19.4 | 18.8  | 15.1  |
| DT13    | Urban Background | Tube            | 92  | 92                               | 19.7                                       | 17.7 | 19.2 | 18.5  | 17.2  |
| DT14    | Roadside         | Tube            | 100   | 100                              | 28.6                                       | 24.4 | 27   | 26.4  | 23.6  |
| DT15    | Urban Background | Tube            | 100   | 100                              | 22.3                                       | 20.2 | 20.3 | 19.4  | 17.5  |
| DT16    | Roadside         | Tube            | 0   | 0                                | 38   | 32.8 | 37.1 | 28.6  | N/A   |
| DT17    | Roadside         | Tube            | 92  | 92                               | 15.1                                       | 14.3 | 16.4 | 14.1  | 13.1  |
| DT18    | Roadside         | Tube            | 50  | 50                               | 25.4                                       | 21.7 | 24.1 | 25.8  | 33.1* |
| DT19    | Roadside         | Tube            | 0   | 0                                | 22.9                                       | 19.8 | 24.5 | 20.3  | NA    |
| DT20    | Roadside         | Tube            | 75  | 75                               | 21.9                                       | 17.6 | 23.1 | 18.2  | 23.2  |
| DT21    | Roadside         | Tube            | 100   | 100                              | 20.8                                       | 18.2 | 20.5 | 18.8  | 16.7  |
| DT22    | Roadside         | Tube            | 92  | 92                               | 24.1                                       | 20.6 | 22.4 | 21.2  | 17.5  |
| DT23a   | Urban Background | Tube            | 83  | 83                               | 20.4                                       | 17.3 | 17.8 | 16.6  | 16.4  |
| DT23b   | Urban Background | Tube            | 83  | 83                               | 19.8                                       | 16.8 | 17.9 | 16.2  | 16.5  |
| DT23c   | Urban Background | Tube            | 83  | 83                               | 19.4                                       | 17.9 | 17.4 | 15.9  | 16.1  |



| Site ID | Site Type        | Monitoring Type | Valid Data Capture for Monitoring Period (%) [1]. | Valid Data Capture 2018 (%) [2]. | NO2 Annual Mean Concentration (µg/m3) [3]. |      |      |      |       |
|---------|------------------|-----------------|---|----------------------------------|--|------|------|------|-------|
|         |                  |                 |   |                                  | 2014                                       | 2015 | 2016 | 2017 | 2018  |
| DT26    | Roadside         | Tube            | 100   | 100                              | 21.2                                       | 18.6 | 19.7 | 18.9 | 17.8  |
| DT27    | Urban Background | Tube            | 100   | 100                              | 24   | 20.8 | 22.1 | 21.2 | 17.9  |
| DT28    | Roadside         | Tube            | 100   | 100                              | 21.5                                       | 20.3 | 21   | 21.3 | 16.6  |
| DT29    | Urban Background | Tube            | 100   | 100                              | 12.5                                       | 11.3 | 12.5 | 11.0 | 10.0  |
| DT-6N   | Roadside         | Tube            | 100   | 100                              | -  | -    | -    | -    | 20.2  |
| DT-8N   | Roadside         | Tube            | 100   | 100                              | -  | -    | -    | -    | 17.3  |
| DT-28N  | Roadside         | Tube            | 100   | 100                              | -  | -    | -    | -    | 22.8  |
| DT-30N  | Roadside         | Tube            | 83  | 83                               | -  | -    | -    | -    | 16.0  |
| DT-32N  | Roadside         | Tube            | 58  | 58                               | -  | -    | -    | -    | 23.4* |
| DT-LN1  | Roadside         | Tube            | 92  | 92                               | -  | -    | 22.7 | 18.5 | 18.6  |
| DT-LN2  | Roadside         | Tube            | 75  | 75                               | -  | -    | 16.9 | 16.6 | 14.5  |
| DT-LN3  | Roadside         | Tube            | 83  | 83                               | -  | -    | 13.2 | 12.7 | 11.8  |
| DT-LN4  | Roadside         | Tube            | 92  | 92                               | -  | -    | 15.2 | 14.6 | 12.1  |
| DT-LN5a | Roadside         | Tube            | 92  | 92                               | -  | -    | 26.7 | 26.3 | 24.3  |
| DT-LN5b | Roadside         | Tube            | 92  | 92                               | -  | -    | 26   | 26.7 | 23.9  |
| DT-LN5c | Roadside         | Tube            | 92  | 92                               | -  | -    | 25.6 | 27.4 | 24.6  |

☒ Diffusion tube data has been bias corrected ☒ Annualisation has been conducted where data capture is <75%

#### Notes:

(\*) Annualised data

(NA) Not Active

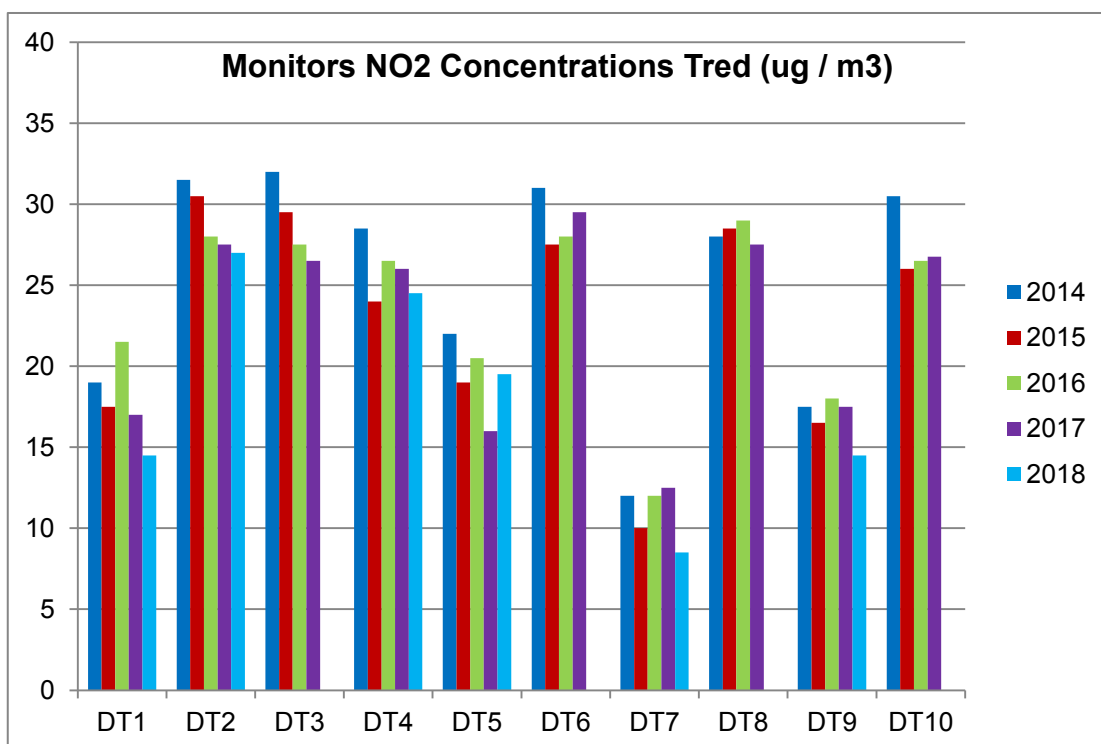
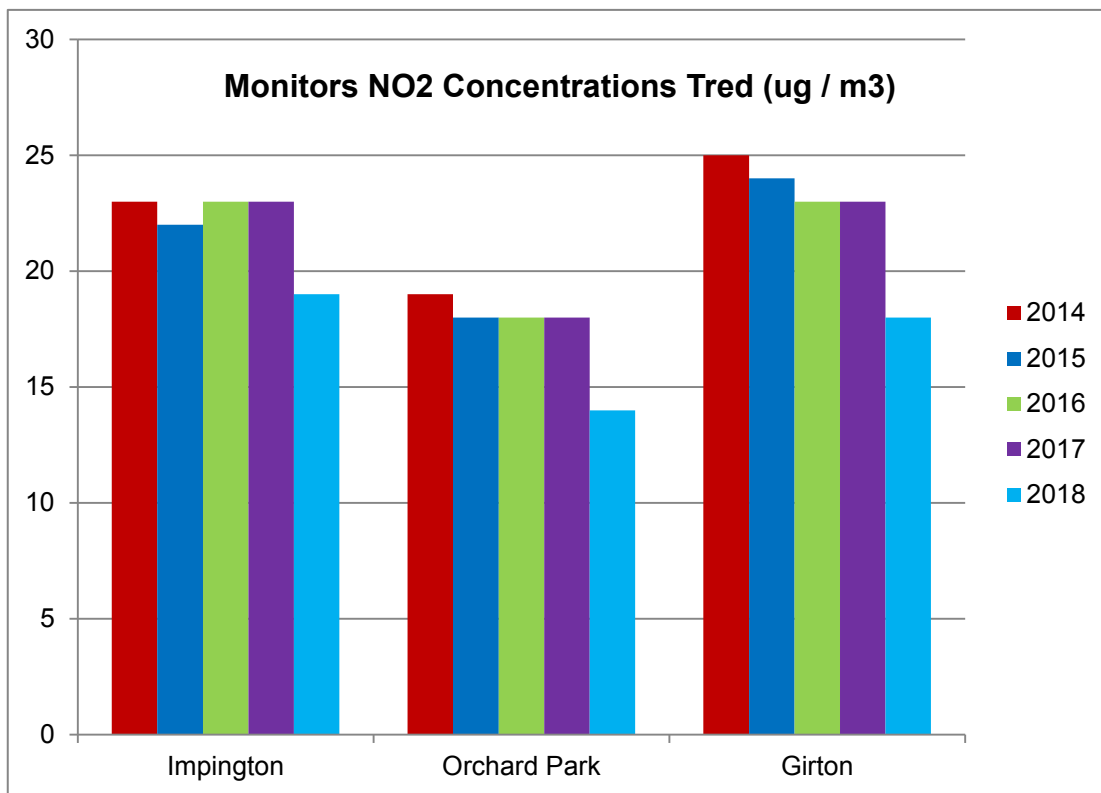
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

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

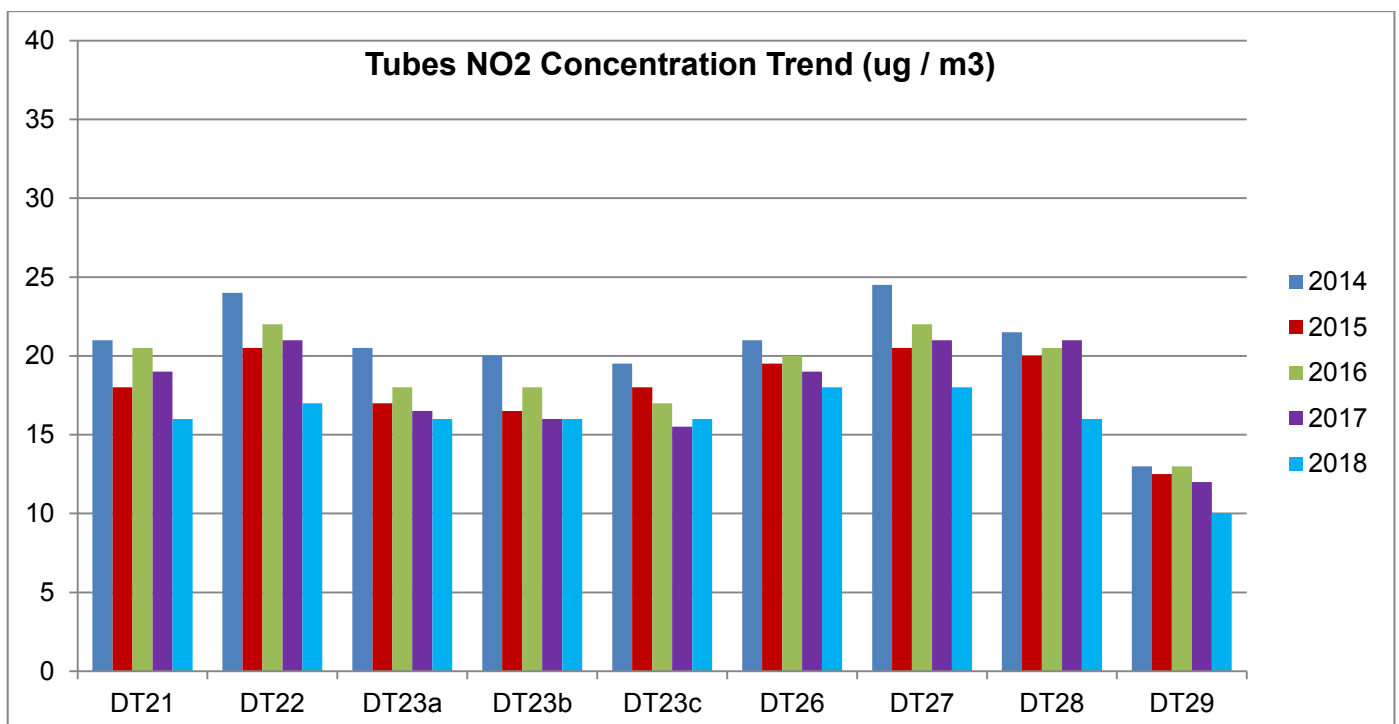
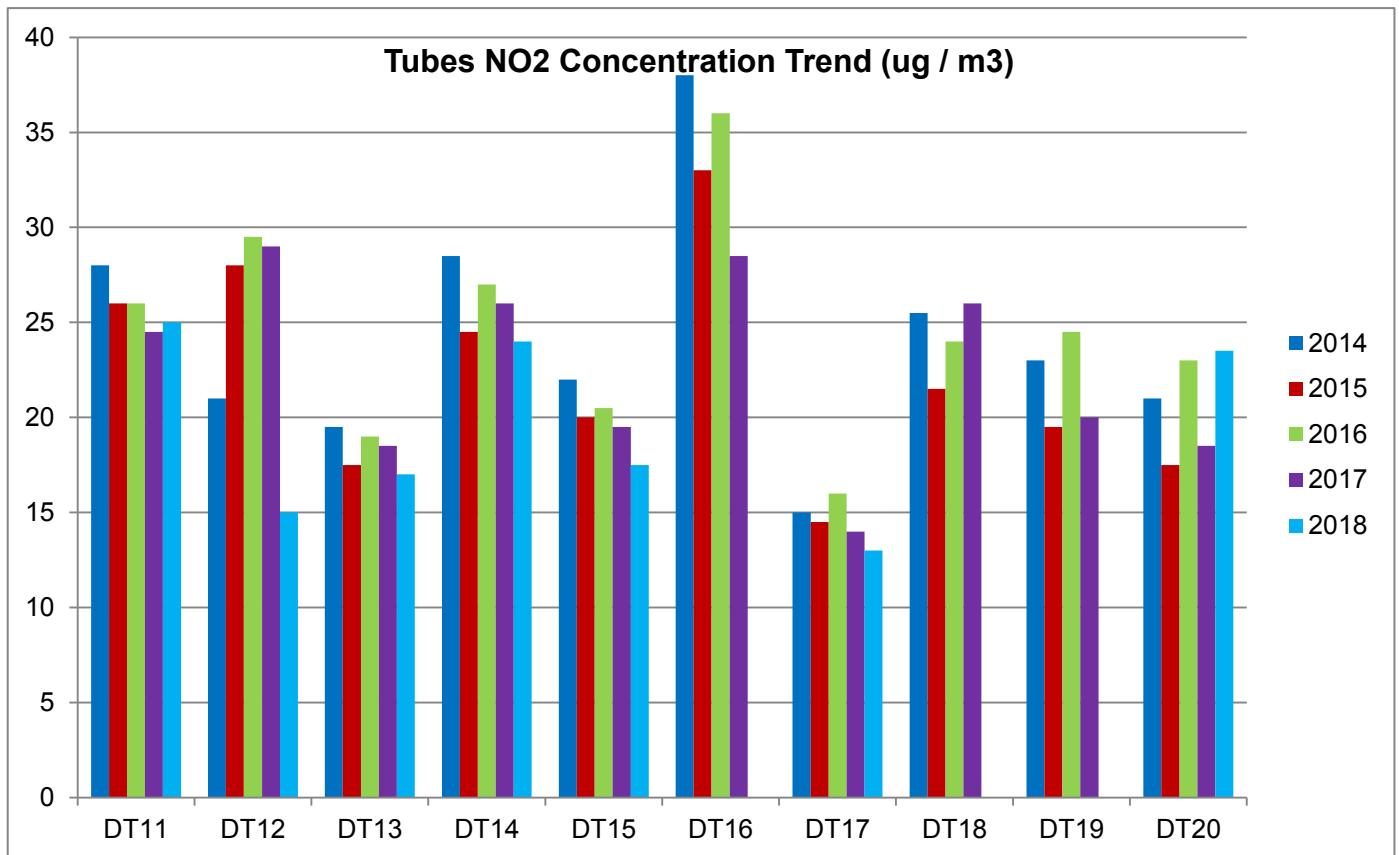
(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.



## Trends in Annual Mean NO<sub>2</sub> Concentrations



## Trends in Annual Mean NO<sub>2</sub> Concentrations – Continued



## 1 Hour Mean NO<sub>2</sub> Monitoring Results

| Site ID | Site Type        | Monitoring Type | Valid Data Capture for Monitoring Period (%) [1]. | Valid Data Capture 2018 (%) [2]. | NO <sub>2</sub> 1 – Hour Means 200 µg/m <sup>3</sup> [3]. |      |      |      |      |
|---------|------------------|-----------------|---|----------------------------------|---|------|------|------|------|
|         |                  |                 |   |                                  | 2014  | 2015 | 2016 | 2017 | 2018 |
| IMP     | Roadside         | Automatic       | 98  | 98                               | 0   | 0    | 0    | 0    | 0    |
| ORCH    | Urban Background | Automatic       | 97  | 97                               | 0   | 0    | 0    | 0    | 0    |
| GIRT    | Roadside         | Automatic       | 95  | 95                               | 0   | 0    | 0    | 0    | 0    |

### Notes:

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

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

[3] If the period of valid data is less than 85%, the 99.8<sup>th</sup> percentile of 1-hour means is provided in brackets.

## PM<sub>10</sub> Annual Mean Concentration (µg/m<sup>3</sup>)

| Site ID | Site Type        | Valid Data Capture for Monitoring Period (%) [1]. | Valid Data Capture 2018 (%) [2]. | PM <sub>10</sub> Annual Mean Concentration (µg/m <sup>3</sup> [3]. |      |      |      |      |
|---------|------------------|---|----------------------------------|--|------|------|------|------|
|         |                  |   |                                  | 2014   | 2015 | 2016 | 2017 | 2018 |
| IMP     | Roadside         | 92  | 92                               | 22   | 18   | 17   | 16   | 17   |
| ORCH    | Urban Background | 92  | 92                               | 22   | 16   | 16   | 14   | 14   |
| GIRT    | Roadside         | 91  | 91                               | 16   | 11   | 17   | 17   | 17   |

Annualisation has been conducted where data capture is <75%

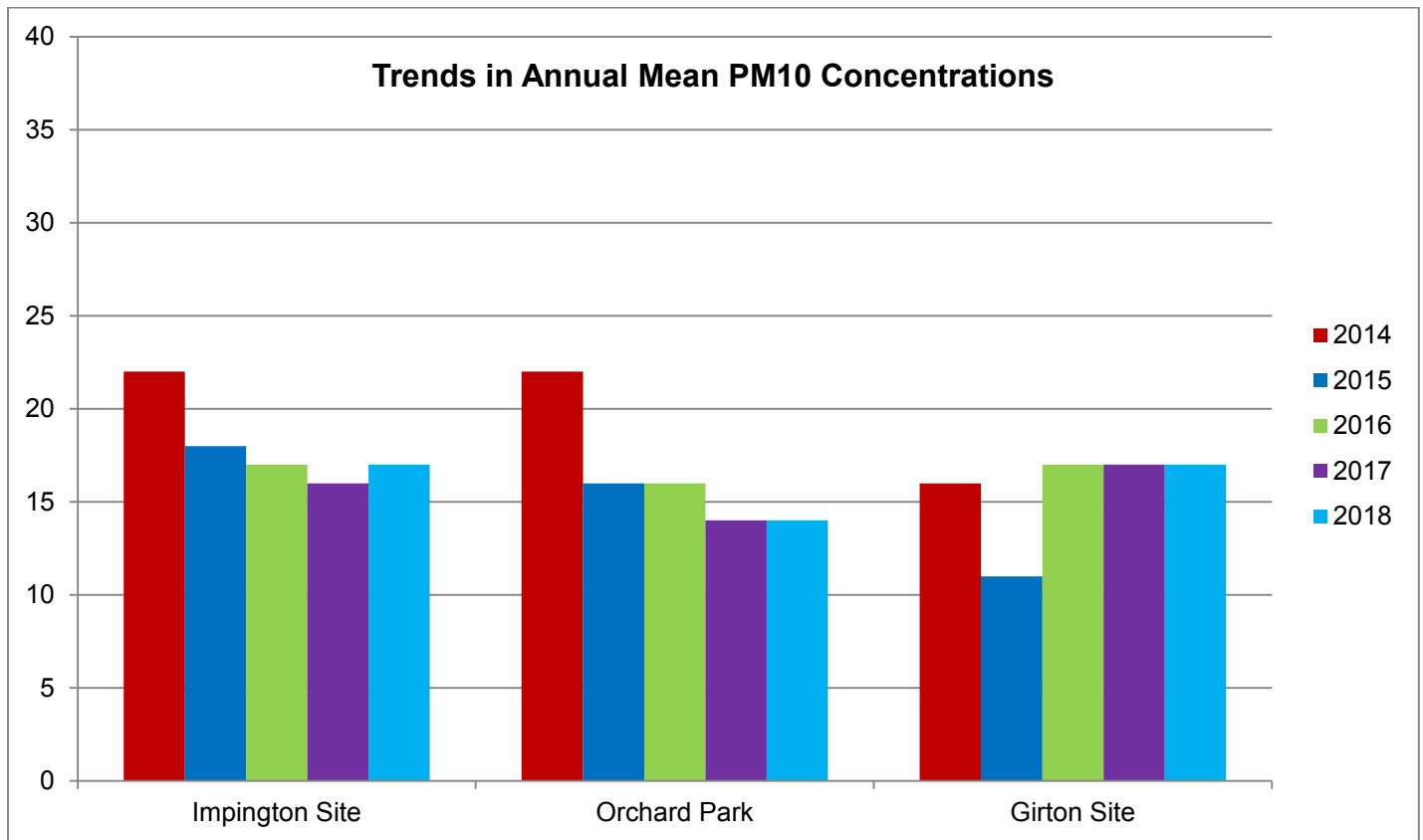
### Notes:

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

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

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

## Trends in Annual Mean PM<sub>10</sub> Concentrations



## 24 Hour Mean PM<sub>10</sub> Monitoring Results

| Site ID | Site Type        | Valid Data Capture for Monitoring Period (%) [1]. | Valid Data Capture 2018 (%) [2]. | PM <sub>10</sub> 24 – Hour Means > 50µg/m <sup>3</sup> [3]. |      |      |      |      |
|---------|------------------|---|----------------------------------|---|------|------|------|------|
|         |                  |   |                                  | 2014  | 2015 | 2016 | 2017 | 2018 |
| IMP     | Roadside         | 92  | 92                               | 4   | 2    | 1    | 2    | 1    |
| ORCH    | Urban Background | 92  | 92                               | 7   | 1    | 1    | 1    | 1    |
| GIRT    | Roadside         | 91  | 91                               | 2   | 1    | 1    | 1    | 1    |

### Notes:

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

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

[3] If the period of valid data is less than 85%, the 90.4<sup>th</sup> percentile of 24-hour means is provided in brackets.

## PM<sub>2.5</sub> Monitoring Results

| Site ID | Site Type | Valid Data Capture for Monitoring Period (%) [1]. | Valid Data Capture 2018 (%) [2]. | PM10 24 – Hour Means > 50µg/m <sup>3</sup> [3]. |      |      |      |      |
|---------|-----------|---|----------------------------------|---|------|------|------|------|
|         |           |   |                                  | 2014  | 2015 | 2016 | 2017 | 2018 |
| GIRT    | Roadside  | 92  | 92                               | 12  | 11   | 13   | 11   | 11   |

☒ Annualisation has been conducted where data capture is <75%

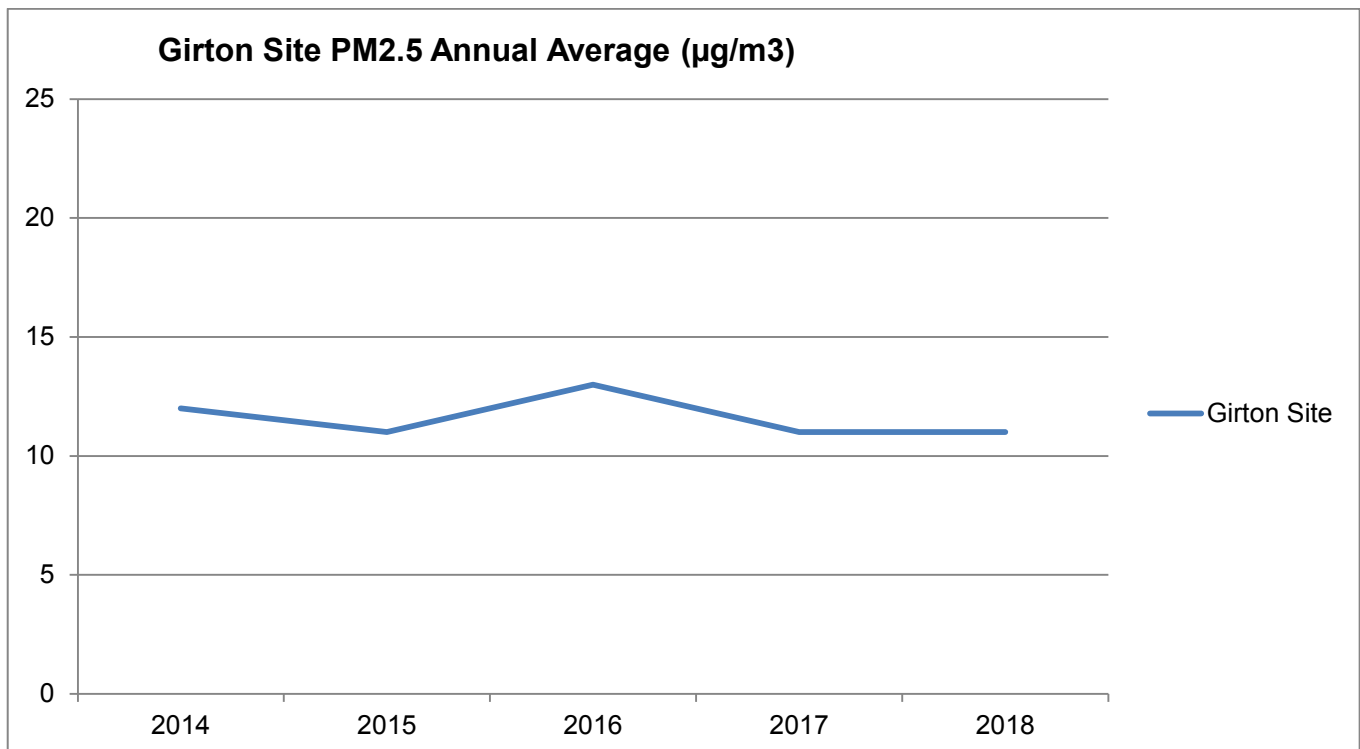
### Notes:

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

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

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

## Trends in Annual Mean PM<sub>2.5</sub> Concentrations





# Full Monthly Diffusion Tube Results for 2018

## NO2 Monthly Diffusion Tube Results - 2018

| Site ID | NO2 Mean Concentrations ( $\mu\text{g}/\text{m}^3$ ) |         |          |         |          |          |      |         |         |          |          |          | Annual Mean |   |
|---------|--|---------|----------|---------|----------|----------|------|---------|---------|----------|----------|----------|-------------|---|
|         | Jan  | Feb     | Mar      | Apr     | May      | Jun      | Jul  | Aug     | Sep     | Oct      | Nov      | Dec      | Raw Data    | Bias Adjusted (0.76) and Annualised [1] |
|         | DT1  | 24.6    | 24.1     | 25.1    | 16.6     | 15.8     | 10.0 | 16.2    | 14.2    | 20.1     | 18.1     | 25.4     |             |   |
| DT2     | 40.9 [3]   | 35.3    | 43.4 [3] | 37.4    | 32.6     | 23.7     | 36.8 | 31.0    | 39.9    | 31.3     | 39.9     | 36.1     | 35.7        | 27.1                                    |
| DT3     | Nil  | Nil     | Nil      | Nil     | Nil      | Nil      | Nil  | Nil     | Nil     | Nil      | Nil      | Nil      | Nil         | Nil                                     |
| DT4     | 38.5   | 38      | 33.1     | 30.7    | 28.2     | 23.1     | 30.8 | 27.6    | 32.1    | 36.3     | 36.1     | 35.8     | 32.5        | 24.7                                    |
| DT5     | 19.9   | 25.8    | 27.9     | 20.4    | 33.7     | 24.3     | 25.4 | 14.1    | 17.9    | 24.6     | -        | 46.3 [3] | 25.5        | 19.4                                    |
| DT6     | Nil  | Nil     | Nil      | Nil     | Nil      | Nil      | Nil  | Nil     | Nil     | Nil      | Nil      | Nil      | Nil         | Nil                                     |
| DT7     | Missing  | Missing | 15.1     | 11.7    | 8.2      | 6        | 4.6  | 9.2     | 13.5    | Missing  | 18.5     | 15.5     | 11.4        | 8.6                                     |
| DT8     | Nil  | Nil     | Nil      | Nil     | Nil      | Nil      | Nil  | Nil     | Nil     | Nil      | Nil      | Nil      | Nil         | Nil                                     |
| DT9     | Missing  | 26.3    | 22.9     | 15.8    | 12.7     | 7.8      | 12.8 | 14.8    | 21      | 20.7     | 26.6     | 27.5     | 19.0        | 14.4                                    |
| DT10    | 35.7   | Missing | 86 [3]   | Missing | Missing  | Missing  | 21.9 | Missing | Missing | Missing  | 26.4     | 29.6     | 39.9        | 25.8 [4]                                |
| DT11    | 38.5   | 36.6    | 37.4     | 30.2    | 27.4     | 26.9     | 34.2 | 29.5    | 34.5    | 30.6     | 31.5     | 35.8     | 32.8        | 24.9                                    |
| DT12    | Missing  | 24.3    | 25.9     | 22.5    | 12.7     | 10.5     | 15.9 | 15      | 22.2    | 20.7     | 28       | 21.2     | 19.9        | 15.1                                    |
| DT13    | 31.9   | 27.7    | 26.8     | 19      | 14.2     | 16.7     | 16.9 | 15.3    | 23.6    | Missing  | 28.8     | 28.5     | 22.7        | 17.2                                    |
| DT14    | 41.9 [3]   | 28.8    | 42 [3]   | 25.5    | 26       | 17       | 26.6 | 22.7    | 33.4    | 32.8     | 40.2 [3] | 25.4     | 31.0        | 23.6                                    |
| DT15    | 31.4   | 27.6    | 32.1     | 24.1    | 17.5     | 11.2     | 18.4 | 15.7    | 21.4    | 22       | 29.4     | 25.9     | 23.1        | 17.5                                    |
| DT16    | Nil  | Nil     | Nil      | Nil     | Nil      | Nil      | Nil  | Nil     | Nil     | Nil      | Nil      | Nil      | Nil         | Nil                                     |
| DT17    | 20.8   | 20.2    | 19.7     | 14.3    | 12.5     | 10.3     | 14.9 | 13.7    | Missing | 17.3     | 24.9     | 21       | 17.2        | 13.1                                    |
| DT18    | 35.3   | Missing | Missing  | 35.9    | 50.1 [3] | 47.8 [3] | 36.2 | 21      | 29.2    | Missing  | Missing  | Missing  | 36.5        | 33.1 [4]                                |
| DT19    | Nil  | Nil     | Nil      | Nil     | Nil      | Nil      | Nil  | Nil     | Nil     | Nil      | Nil      | Nil      | Nil         | Nil                                     |
| DT20    | 28.1   | 27.1    | 31.2     | 23.2    | 18.1     | 15.5     | 16.7 | Missing | Missing | 57.9 [3] | Missing  | 57 [3]   | 30.5        | 23.2                                    |
| DT21    | 29.5   | 29.6    | 30.6     | 20.7    | 15.7     | 12.2     | 16.3 | 13.4    | 21.9    | 22.7     | 28.5     | 23.2     | 22.0        | 16.7                                    |
| DT22    | 29.4   | 32.2    | 29.3     | 22.5    | 19.3     | 18.4     | 18   | 14.7    | missing | 21.7     | 22       | 26.4     | 23.1        | 17.5                                    |



| Site ID | NO2 Mean Concentrations ( $\mu\text{g}/\text{m}^3$ ) |      |      |      |         |         |          |         |          |          |          |         | Annual Mean |   |
|---------|--|------|------|------|---------|---------|----------|---------|----------|----------|----------|---------|-------------|---|
|         | Jan  | Feb  | Mar  | Apr  | May     | Jun     | Jul      | Aug     | Sep      | Oct      | Nov      | Dec     | Raw Data    | Bias Adjusted (0.76) and Annualised [1] |
|         | DT23a  | 27.3 | 20.6 | 21.5 | 17.8    | 12      | 11.2     | 13.3    | Missing  | Missing  | 25.8 [3] | 22.5    |             |   |
| DT23b   | 27   | 19.9 | 21.9 | 14.5 | 12.5    | 10.8    | 13.5     | Missing | Missing  | 51.4 [3] | 21.9     | 23.2    | 21.7        | 16.5                                    |
| DT23c   | 23.9   | 22.6 | 22.8 | 15.1 | 11.6    | 10.8    | 13       | Missing | Missing  | 49 [3]   | 21.6     | 22      | 21.2        | 16.1                                    |
| DT26    | 28.8   | 28.1 | 29.2 | 21.4 | 18.2    | 14.9    | 18.2     | 15.3    | 24.7     | 24.4     | 30.9     | 27.1    | 23.4        | 17.8                                    |
| DT27    | 25.6   | 35.5 | 23.6 | 23   | 20.9    | 16.1    | 17.9     | 16.6    | 22.7     | 26.2     | 29.8     | 25.1    | 23.6        | 17.9                                    |
| DT28    | 24.2   | 28.7 | 23.5 | 19.6 | 15.3    | 13.1    | 15.7     | 14.2    | 23.1     | 22.6     | 31.2     | 30.4    | 21.8        | 16.6                                    |
| DT29    | 16.8   | 18.1 | 14.9 | 11.4 | 10.4    | 4.6     | 8.9      | 9.2     | 13.5     | 13.8     | 18.8     | 17.8    | 13.2        | 10.0                                    |
| DT6N    | 28.2   | 32.6 | 28.1 | 27.2 | 20.7    | 19.4    | 22.4     | 20.9    | 26.1     | 29       | 34.2     | 29.8    | 26.6        | 20.2                                    |
| DT8N    | 26.3   | 31.2 | 25.9 | 21.6 | 19.1    | 13.9    | 22.1     | 14.7    | 18.8     | 21.6     | 34.5     | 23.3    | 22.2        | 17.3                                    |
| DT28N   | 42.2 [3]   | 35.9 | 27.9 | 28.6 | 19.2    | 16.6    | 22.9     | 22.3    | 33.6     | 30.4     | 24.3     | 38      | 30.0        | 22.8                                    |
| DT30N   | Nil  | 35.2 | 22.5 | 21.4 | 9.8     | Missing | 15.4     | 14.4    | 22.7     | 27.2     | 27.2     | 21.0    | 21.0        | 16.0                                    |
| DT32N   | Nil  | Nil  | Nil  | 26.8 | 29.1    | 23      | 28.6     | 25.4    | Missing  | Missing  | 28.3     | 33      | 27.7        | 23.4 [4]                                |
| DTLN1   | 26.1   | 27.4 | 27.7 | 24.2 | 18.7    | 19.3    | 22.8     | 18.2    | 26.9     | 28.1     | 30.4     | Missing | 24.5        | 18.6                                    |
| DTLN2   | 26.9   | 23.6 | 21.4 | 20.6 | 12.4    | 11.7    | 15.2     | 14.9    | Missing  | Missing  | 25.5     | Missing | 19.1        | 14.5                                    |
| DTLN3   | 22.8   | 19   | 14.4 | 11.5 | Missing | Missing | 10       | 10.3    | 15.4     | 16.1     | 20       | Missing | 15.5        | 11.8                                    |
| DTLN4   | 25.2   | 21.6 | 18   | 13.8 | 10.7    | 8       | 11.4     | 10.8    | 14.3     | 17.3     | 23.4     | Missing | 15.9        | 12.1                                    |
| DTLN5a  | 28.6   | 28.1 | 28   | 28.6 | 30.6    | 31.5    | 41.2 [3] | 30.1    | 39.3     | 37.1     | 28.9     | Missing | 32.0        | 24.3                                    |
| DTLN5b  | 29.6   | 34.6 | 24.5 | 23.9 | 29.6    | 32.5    | 40.9 [3] | 30.3    | 37.9     | 36.7     | 25.3     | Missing | 31.4        | 23.9                                    |
| DTLN5c  | 36   | 33.1 | 27.9 | 26.6 | 27.6    | 34.6    | 38.6     | 31      | 40.3 [3] | 34.7     | 25.7     | Missing | 32.4        | 24.6                                    |

☒ National bias adjustment factor used. ☒ Annualisation has been conducted where data capture is <75%

**Notes:**

[1] See Appendix C for details on bias adjustment and annualisation.

[2] Distance corrected to nearest relevant public exposure.

[3] Exceedances of the NO<sub>2</sub> annual mean objective of 40 $\mu\text{g}/\text{m}^3$ .

[4] NO<sub>2</sub> annual means exceeding 60 $\mu\text{g}/\text{m}^3$ , indicating a potential exceedance of the NO<sub>2</sub> 1-hour mean objective.



## Supporting Technical Information / Air Quality Monitoring Data QA/QC

### Automatic Monitoring

South Cambridgeshire District Council is a member of the Calibration Club, operated by AEAT now Ricardo – AEA. All NO<sub>x</sub> analysers are chemiluminescence analysers. All particulate matter analysers are BAMs. In line with current guidance, BAM data is multiplied by 1.3 to give the gravimetric equivalent. QA/QC of automatic monitoring data is carried out by Ricardo – AEA (<http://www.aeat.co.uk>). Tri-annual audits of the monitoring stations are carried out by Ricardo. Services of all the three AQ monitoring stations i.e. Impington, Girton and Orchard Park are carried out bi-annually by the equipment suppliers; Enviro - Technology. The sites are manually calibrated on a monthly basis by the Local Site Operative. The output from the calibrations is forwarded to Ricardo – AEA for QA/QC and ratification purposes.

### Non-Automatic Monitoring

NO<sub>2</sub> monitoring was undertaken at 27 sites within the district using passive diffusion tubes. The samples have been analysed in accordance with SOCOTEC's standard operating procedure ANU/SOP/1015. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO<sub>2</sub> Monitoring: Practical Guidance.' The tubes were prepared by spiking acetone triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow auto-analyser with ultraviolet detection. Please note:

- (i) As set out in the practical guidance, the results were initially calculated assuming an ambient temperature of 11°C, the reported values have been adjusted to 20°C to allow for direct comparison with EU limits.
- (ii) The reported results have not been bias adjusted.

This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of our UKAS schedule. Any further calculations and assessments requiring exposure details and conditions fall outside the scope of our accreditation. In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a satisfactory laboratory.

A national bias adjustment factor of 0.76 has been applied to the 2018 diffusion tube results. Data capture for all tube results was sufficient as to not warrant annualisation except for DT10, DT18 & DT32N.

## Annualisation for DT10, DT18 & DT32N according to Box 7.9 TG (16)

| Background Site   | Date Capture % | NG               | Distance to DT18 | Distance to DT32N | Distance to DT10 | 2018 Annual Mean Am | Period mean DT18 | Period mean DT32N | Period mean DT10         | Ratio (Am/Pm) for DT18 | Ratio (Am/Pm) for DT32N | Ratio (Am/Pm) for DT10 |
|-------------------|----------------|------------------|------------------|-------------------|------------------|---------------------|------------------|-------------------|--------------------------|------------------------|-------------------------|------------------------|
| Wicken Fen        | 97             | 556316<br>269179 | 18               | 17                | 17               | 7.7                 | 6.4              | 6.7               | 9.4                      | 1.20                   | 1.14                    | 0.82                   |
| Market Harborough | 98             | 483340<br>295886 | 44               | 46                | 46               | 8.0                 | 6.5              | 7.2               | 9.8                      | 1.23                   | 1.11                    | 0.81                   |
| Oxford St Ebbes   | 100            | 451168<br>205382 | 65               | 66                | 66               | 14.8                | 12.9             | 13.5              | 16.1                     | 1.15                   | 1.06                    | 0.92                   |
|                   |                |                  |                  |                   |                  |                     |                  |                   | <b>Average of Ratios</b> | 1.19                   | 1.11                    | 0.85                   |

| Tube ID | Annual Mean Not Adjusted | (Ra) Annualisation Factor | Annualised Mean | National Bias Adjusted Mean 0.76 |
|---------|--------------------------|---------------------------|-----------------|----------------------------------|
| DT18    | 36.5                     | 1.19                      | 43.5            | 33.1                             |
| DT32N   | 27.7                     | 1.11                      | 30.8            | 23.4                             |
| DT10    | 39.9                     | 0.85                      | 33.9            | 25.8                             |

## National Bias Adjustment Factor

| Analysed By    | Method             | Year | Site Type        | Local Authority                 | Length of Study (Months) | Diffusion Tube Mean Conc. (Dm) ( $\mu\text{g}/\text{m}^3$ ) | Automatic Monitor Mean Conc. (Cm) ( $\mu\text{g}/\text{m}^3$ ) | Bias (B)                           | Tube Precision | Bias Adjustment Factor (A) (Cm/Dm) |
|----------------|--------------------|------|------------------|---------------------------------|--------------------------|---|--|------------------------------------|----------------|------------------------------------|
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Cambridge City Council          | 12                       | 42  | 30   | 40.2%                              | G              | 0.71                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Canterbury City Council         | 11                       | 38  | 28   | 35.8%                              | G              | 0.74                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Urban Background | Canterbury City Council         | 12                       | 16  | 12   | 36.3%                              | G              | 0.73                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Hambleton District Council      | 12                       | 21  | 18   | 20.8%                              | G              | 0.83                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Ipswich Borough Council         | 12                       | 34  | 29   | 17.9%                              | G              | 0.85                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | City of York Council            | 12                       | 41  | 27   | 54.2%                              | G              | 0.65                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Urban Background | City of York Council            | 11                       | 22  | 15   | 52.0%                              | G              | 0.66                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | City of York Council            | 12                       | 34  | 26   | 30.8%                              | G              | 0.76                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | City of York Council            | 11                       | 30  | 23   | 32.9%                              | G              | 0.75                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Dumfries and Galloway Council   | 12                       | 36  | 30   | 19.8%                              | G              | 0.83                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Knowsley MBC                    | 12                       | 47  | 38   | 26.5%                              | G              | 0.79                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Suffolk Coastal DC              | 11                       | 44  | 33   | 32.4%                              | G              | 0.76                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Thanet District Council         | 10                       | 26  | 21   | 25.4%                              | G              | 0.80                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Horsham District Council        | 11                       | 33  | 23   | 42.4%                              | G              | 0.70                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Horsham District Council        | 12                       | 33  | 29   | 17.2%                              | G              | 0.85                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Horsham District Council        | 12                       | 30  | 26   | 16.1%                              | G              | 0.86                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Urban Background | Slough Borough Council          | 10                       | 38  | 31   | 25.6%                              | G              | 0.80                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | SU               | Slough Borough Council          | 11                       | 32  | 22   | 46.7%                              | G              | 0.68                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Slough Borough Council          | 11                       | 39  | 32   | 22.5%                              | G              | 0.82                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | Roadside         | Vale of Glamorgan               | 12                       | 39  | 25   | 57.8%                              | G              | 0.63                               |
| SOCOTEC Didcot | 50% TEA in acetone | 2018 | KS               | Marylebone Road Intercomparison | 9                        | 96  | 87   | 9.1%                               | G              | 0.92                               |
|                |                    |      |                  |                                 |                          |   |  | <b>Overall Factor (24 Studies)</b> | <b>Use</b>     | <b>0.76</b>                        |

# Map(s) of Monitoring Locations and AQMAs

## Automatic Monitoring Stations Location

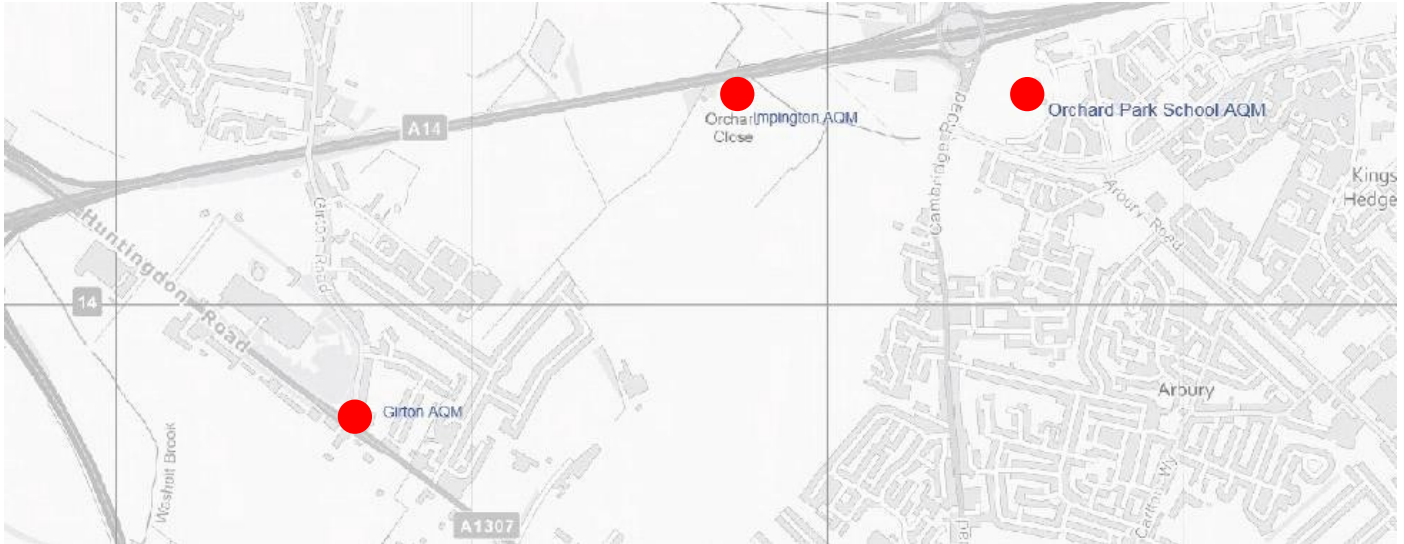


Figure 2 - Automatic Monitoring Stations Location

## Diffusion Tubes Location

### Orchard Park and Impington Tubes

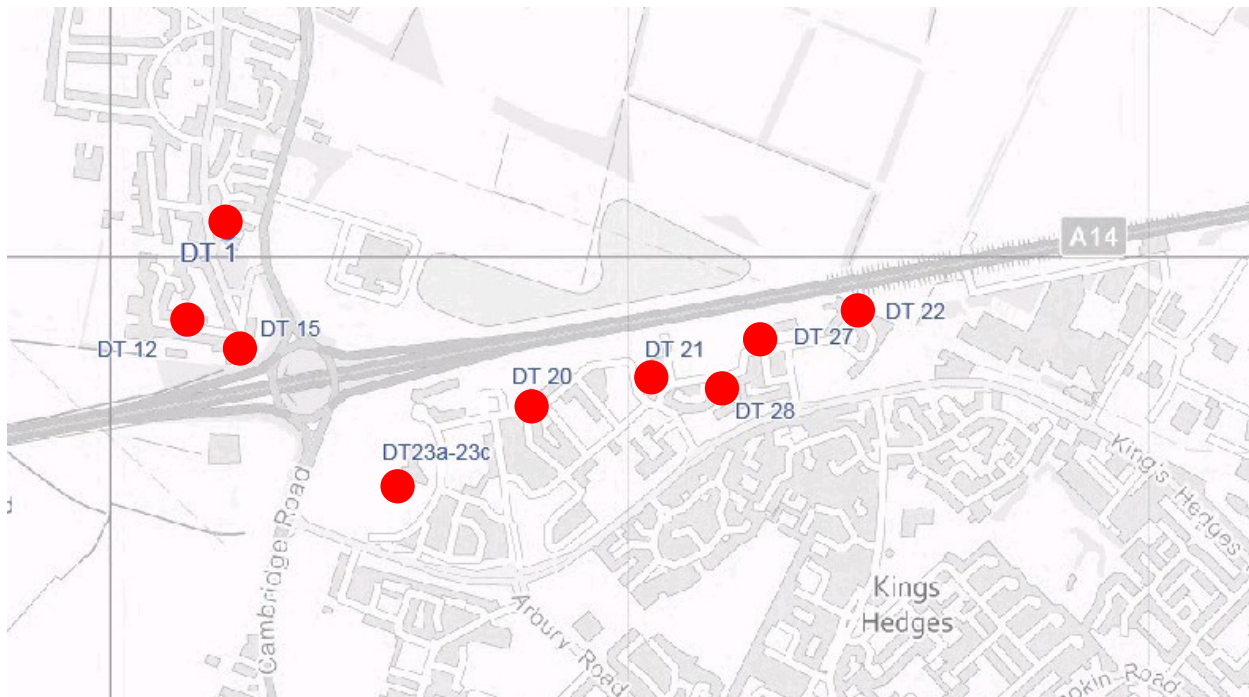


Figure 3 - Orchard Park and Impington Tubes



## Histon Tubes

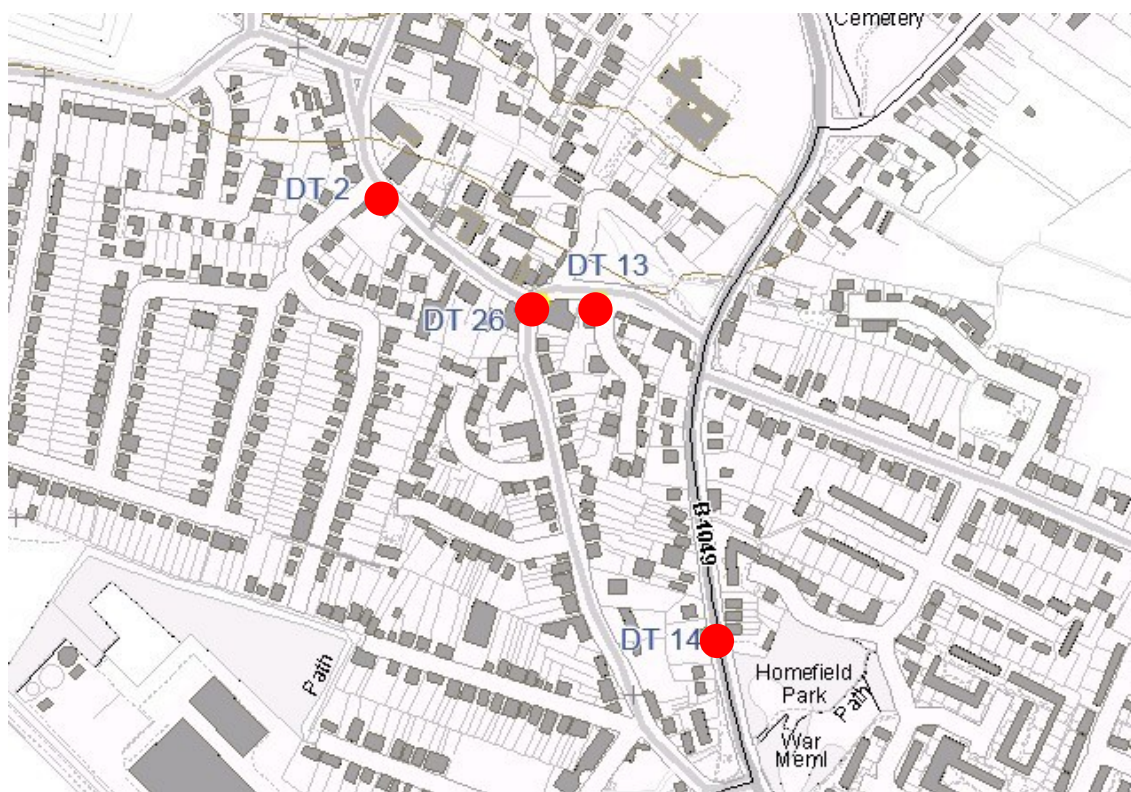


Figure 4 - Histon Tubes

## Bar Hill and A14 Tubes



Figure 5 - Bar Hill and A14 Tubes

# Waterbeach Tube

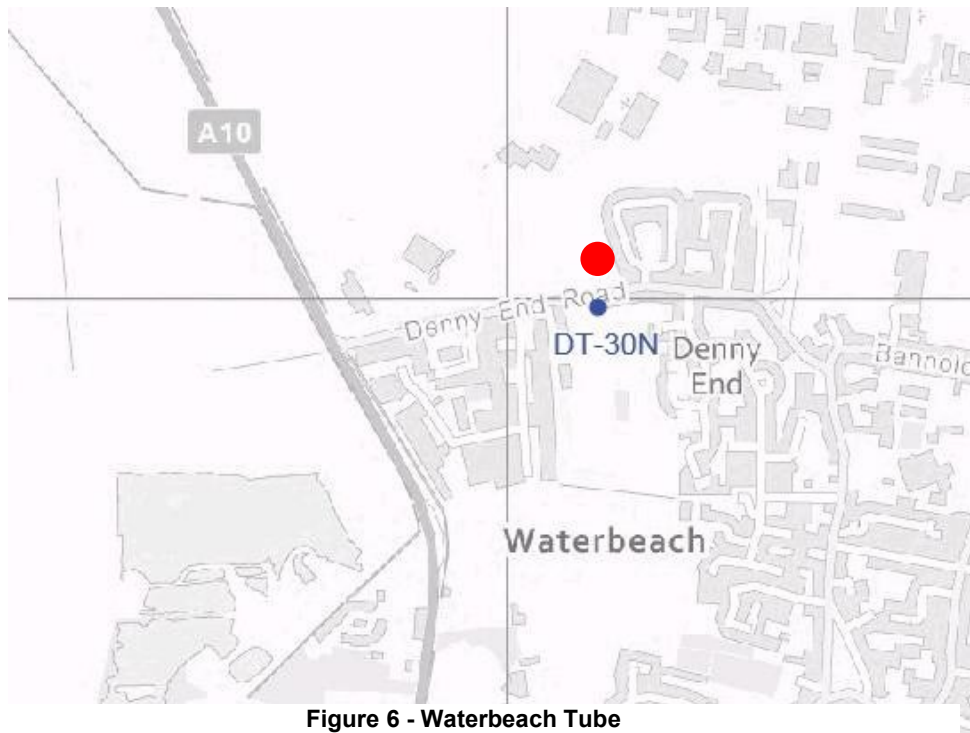


Figure 6 - Waterbeach Tube

# Milton

# Tubes

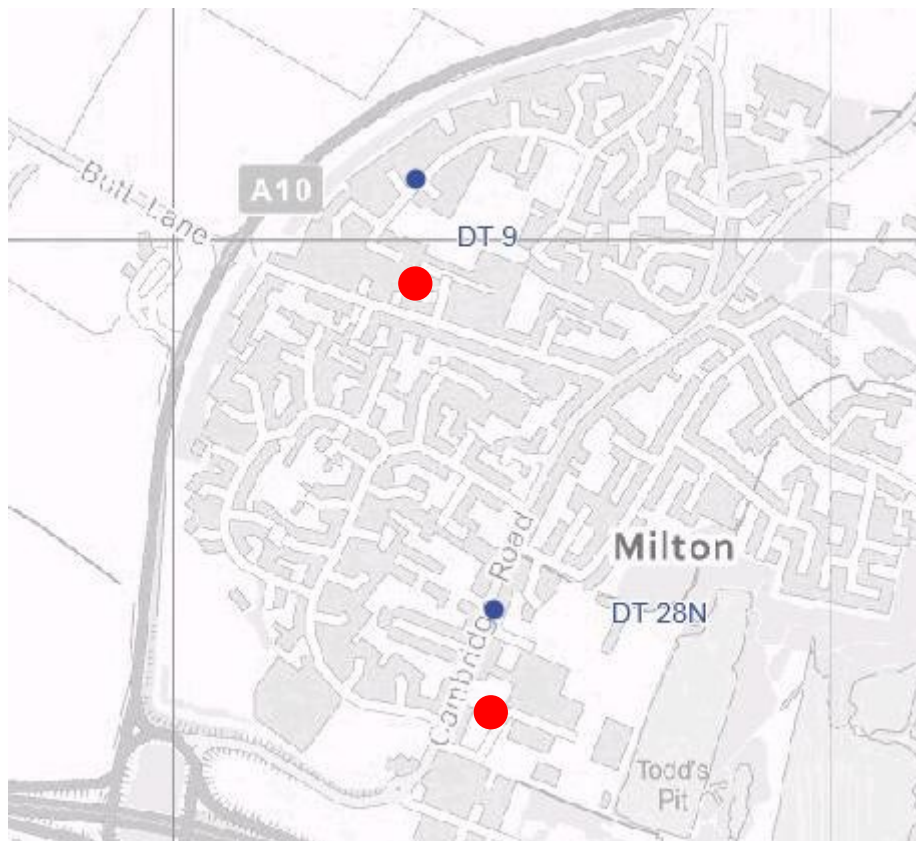


Figure 7 - Milton Tubes

## Tubes South of District



Figure 8 - Tubes South of District

## Tadlow Tube

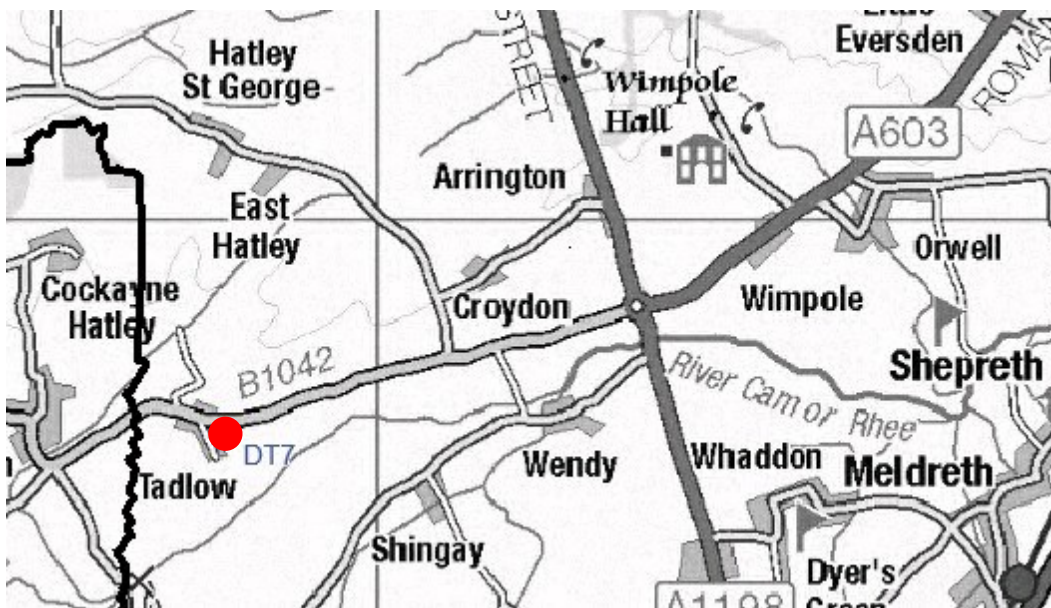


Figure 9 - Tadlow Tube

# Summary of Air Quality Objectives in England



## Air Quality Objectives in England

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



## Glossary of Terms



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

## References

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