



2017 Air Quality Annual Status Report (ASR)

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

June 2017

| | |
|-------------------------|--|
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Executive Summary: Air Quality in Our Area

Air Quality in South Norfolk

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^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

Air quality in the South Norfolk Council area is generally good with no recorded exceedance of air quality objectives. There are no declared Air Quality Management Areas (AQMA's) within the district.

The main pollutant of local concern is nitrogen dioxide— primarily from road traffic sources and stationary combustion sources (such a domestic and other appliances). This is typical for a primarily rural and semi urban area such as South Norfolk.

As regards nitrogen dioxide (NO₂), monitoring of takes place at 29 locations within the district. There are a couple of locations which have are close to the NO₂ annual mean AQS objective but none have been recorded as breaching the Air Quality standards. As highlighted in previous a bypass has been proposed for Long Stratton as part of the Long Stratton Area Action Plan.

A detailed assessment is not required for any pollutants and the Council will progress to the next Annual Status Report for 2017.

Actions to Improve Air Quality

The District does not have any AQMAs and so there is no action plan to improve air quality. However, the Council works closely with a range of partners as air pollution is a transboundary (and international) issue. The Norfolk Environmental Protection group is the principal body across the County coordinating and seeking consistency

¹ Environmental equity, air quality, socioeconomic status and respiratory health, 2010

² Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

³ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

in the management of air quality by partner local authorities including Norfolk County Council's Highway Department and Public Health Team and the Environment Agency.

Local authorities regulate a range of industries that may cause local emissions to air and this work also forms part of our response to securing air quality in the district. We work closely with businesses and industry to ensure that no adverse impacts arise from industrial processes as part of the so called LA-PPC regime. We also work closely as part of the development and planning process to secure local air quality where development is proposed.

Conclusions and Priorities

- The Council's vision supports the review and assessment of air quality

Corporate Vision – 2016/20

“To retain and improve the quality of life and prosperity of South Norfolk, for now and future generations, to make it one of the best places to live and work in the country”

Corporate Priorities –

- **Economic growth, productivity and prosperity:**
Providing the conditions to stimulate growth, productivity and prosperity, sharing the benefits of growth with our communities.
- **Health, Well-being and Early help**
Proactively working with communities to provide help at the earliest opportunity and enhancing the health and well-being of our residents
- **Place, Communities and Environment**
Improving the quality of life of our communities and enhancing the built and natural environment in our towns and villages

The focus of our work on air quality relates to nitrogen dioxide from road traffic. As a rural district the most residents use private vehicles. This causes localised peaks with vehicle emissions in some towns particularly where there are busy through roads.

We will continue to measure NO_x using non-automatic diffusion tubes. We will continue to assess progression of the application for the Long Stratton bypass and associated development plans.

Local Engagement and How to get Involved

Residents and businesses can discuss any concerns or questions in relation to air quality to the Environmental Quality team.

If people would like to find out more about air quality, and how they can contribute to improving it in their area, these links can provide further information:

- Defra's – UK Government – UK-Air website: <https://uk-air.defra.gov.uk/>
- Sustrans' 'CleanSpace' sustainable transport and air quality movement: <http://www.sustrans.org.uk/what-you-can-do/use-your-car-less/join-air-quality-movement> -
- 'Air Pollution' website – college/university level: <http://www.air-quality.org.uk/index.php>
- BBC 'Bitesize' – GCSE air quality: http://www.bbc.co.uk/schools/gcsebitesize/science/21c/air_quality/
- 'Clean Air Kids' – air quality website for children aged 5-11: <http://www.clean-air-kids.org.uk/index.html>
- Evolution of WHO air quality guidelines: past, present and future (2017) – report on the World Health Organisation's evolving advice: <http://www.euro.who.int/en/health-topics/environment-and-health/air-quality/publications/2017/evolution-of-who-air-quality-guidelines-past,-present-and-future-2017>

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1 Local Air Quality Management

This report provides an overview of air quality in South Norfolk during 2016. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

The LAQM process places an obligation on all local authorities to regularly review and assess air quality in their areas, and to determine whether or not the air quality objectives are likely to be achieved. Where an exceedance is considered likely the local authority must declare an Air Quality Management Area (AQMA) and prepare an Air Quality Action Plan (AQAP) setting out the measures it intends to put in place in pursuit of the objectives. This Annual Status Report (ASR) is an annual requirement showing the strategies employed by South Norfolk Council to improve air quality and any progress that has been made.

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

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

Air Quality Management Areas (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.

South Norfolk Council currently does not have any AQMAs

For reference, a map of South Norfolk Council's monitoring locations is available in Appendix D.

2.2 Progress and Impact of Measures to address Air Quality in South Norfolk

Defra's appraisal of last year's ASR concluded - "On the basis of the evidence provided by the local authority the conclusions reached are acceptable for all sources and pollutants.

The next step for South Norfolk Council is to submit an Annual Status Report in 2017"

As such no measures to address air quality were required.

2.3 PM_{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations

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

South Norfolk is taking the following measures to address PM_{2.5}.

- The Council is working through the Norfolk Environmental Protection Group's (NEPG) Air Quality Sub-Group, to ensure regular two-way engagement with representatives of Public Health England, and the Director of Public Health at Norfolk County Council;

- The Council is looking to work directly with Public Health England including working to encourage active travel resulting in improvements to air quality;
- Government's removal of environmental permits for small waste oil burners, which has been a source of the PM_{2.5}. The SWOB's provided a localised pressure on air quality.
- We have also been working with local industrial processes and new developments to ensure local air quality is safeguarded via the planning regime.

South Norfolk Council is not required to monitor for PM_{2.5} as there is no statutory requirement to do so. Instead the UK government has a network of air quality monitoring stations across the UK which monitors levels of PM_{2.5}. The results show that the UK currently complies with the 25µg/m³ limit value set by the EU air quality directive.

3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

South Norfolk Council does not undertake any continuous monitoring.

3.1.2 Non-Automatic Monitoring Sites

South Norfolk Council undertook non- automatic (passive) monitoring of NO₂ at 29 sites during 2016 Table A.1 in Appendix A shows the details of the sites.

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

Further details on 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.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B.

There was one exceedance of the annual mean air quality objective for NO₂. This occurred at a roadside location (location 7) which is not representative of public exposure.

We have use the NO₂ fall-off with distance calculator on the LAQM support website and calculated that the levels at a location of relevant exposure are reduced to 33.5ug/m³

All monitoring data presented has been properly ratified and corrected for bias.

Table A.1 – Details of Non-Automatic Monitoring Sites

| Site ID | Site Name | Site Type | X OS Grid Ref | Y OS Grid Ref | Pollutants Monitored | In AQMA? | Distance to Relevant Exposure (m) ⁽¹⁾ | Distance to kerb of nearest road (m) ⁽²⁾ | Tube collocated with a Continuous Analyser? | Height (m) |
|---------|-------------------------------------|-----------|---------------|---------------|----------------------|----------|--|---|---|------------|
| 1 | 46a Old Newmarket Road, Cringleford | Suburban | 619208 | 304645 | NO2 | NO | 0 | 15 | NO | 1.5 |
| 2 | 131 LONGWATER LANE, COSTESSEY | Suburban | 616797 | 310477 | NO2 | NO | 0 | 15 | NO | 1.5 |
| 3 | 90 THE STREET, PORINGLAND | Suburban | 626803 | 302092 | NO2 | NO | 0 | 5 | NO | 1.5 |
| 4 | 87 DENMARK ST, DISS | Suburban | 611223 | 279637 | NO2 | NO | 0 | 3 | NO | 1.5 |
| 5 | 131 VICTORIA RD, DISS | Suburban | 611945 | 279572 | NO2 | NO | 0 | 3 | NO | 1.8 |
| 6 | 21 CHURCH PLAIN, LODDON | Suburban | 636192 | 298751 | NO2 | NO | 0 | 3 | NO | 1.5 |
| 7 | A140 LONG STRATTON | Roadside | 619722 | 292745 | NO2 | NO | 3 | 1 | NO | 2.1 |
| 8 | FAIRLAND ST, WYMONDHAM | Roadside | 611129 | 301425 | NO2 | NO | 0 | 3 | NO | 2.1 |
| 9 | KIRBY BEDON ROAD, BIXLEY | Roadside | 625439 | 305944 | NO2 | NO | 20 | 2 | NO | 2.1 |
| 10 | 209 NORWICH RD, WYMONDHAM | Suburban | 612515 | 302652 | NO2 | NO | 0 | 15 | NO | 1.5 |
| 11 | 2 THICKTHORN COTTAGES | Rural | 618137 | 305678 | NO2 | NO | 0 | 10 | NO | 1.5 |
| 12 | RIGHTUP LANE, WYMONDHAM | Suburban | 611528 | 300987 | NO2 | NO | 20 | 3 | NO | 2.1 |

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|----|---|----------|--------|--------|-----|----|-----|----|----|-----|
| 13 | 233 NORWICH RD, WYMONDHAM | Suburban | 612663 | 302751 | NO2 | NO | 0 | 12 | NO | 1.5 |
| 14 | 28 NORWICH RD, WYMONDHAM | Suburban | 611380 | 302751 | NO2 | NO | 0 | 8 | NO | 1.5 |
| 15 | HARLESTON (HOTEL) | Roadside | 624484 | 283276 | NO2 | NO | 0 | 2 | NO | 2.1 |
| 16 | DISS ROAD, SCOLE | Roadside | 614895 | 278864 | NO2 | NO | 8 | 1 | NO | 1.8 |
| 17 | 84 WEST END, COSTESSEY | Roadside | 616652 | 311650 | NO2 | NO | 1 | 1 | NO | 2.1 |
| 18 | Long Stratton CHINESE | Roadside | 619710 | 292730 | NO2 | NO | 1 | 1 | NO | 2.1 |
| 19 | Long Stratton TRAFFIC LIGHT EAST | Roadside | 619732 | 292740 | NO2 | NO | 7 | 1 | NO | 2.1 |
| 20 | Long Stratton O/S CHEM MAIN ROAD | Suburban | 619706 | 292724 | NO2 | NO | 0 | 2 | NO | 2.1 |
| 21 | Long Stratton SOUTHBOUND 60 MTRS | Suburban | 619694 | 292653 | NO2 | NO | 0 | 2 | NO | 2.1 |
| 22 | Long Stratton SWAN LANE CO- OP CHEM | Roadside | 619710 | 292722 | NO2 | NO | 0 | 2 | NO | 2.1 |
| 23 | 3 NORWICH ROAD, COSTESSEY | Suburban | 618991 | 309796 | NO2 | NO | 0 | 15 | NO | 1.5 |
| 24 | 14 STATION RD, WYMONDHAM | Suburban | 618823 | 293032 | NO2 | NO | 0 | 5 | NO | 1.5 |
| 25 | BUS STOP, NWH RD, STRATTON | Roadside | 619823 | 293032 | NO2 | NO | 5 | 1 | NO | 2.1 |
| 26 | NEWMARKET ROAD, CRINGLEFORD | Roadside | 619801 | 305859 | NO2 | NO | 20 | 2 | NO | 2.1 |
| 27 | LORD NELSON DR | Roadside | 616348 | 310585 | NO2 | NO | 100 | 1 | NO | 2.1 |

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|----|------------------------|----------|--------|--------|-----|----|---|----|----|-----|
| 28 | RIVERSIDE COURT | Suburban | 616797 | 311225 | NO2 | NO | 0 | 15 | NO | 1.5 |
| 29 | 25 BROAD ST, HARLESTON | Suburban | 619131 | 305633 | NO2 | NO | 8 | 0 | NO | 1.5 |
| | | | | | | | | | | |
| | | | | | | | | | | |

Notes:

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

(2) N/A if not applicable.

Table A.2 – Annual Mean NO₂ Monitoring Results

| Site ID | Site Type | Monitoring Type | Valid Data Capture for Monitoring Period (%) ⁽¹⁾ | Valid Data Capture 2016 (%) ⁽²⁾ | NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾ | | | | |
|---------|-----------|-----------------|---|--|---|------|------|------|------|
| | | | | | 2012 | 2013 | 2014 | 2015 | 2016 |
| | | | | | | | | | |
| 1 | Suburban | Diffusion Tube | 100 | 100 | 24.1 | 19.5 | 21.5 | 17.1 | 20.2 |
| 2 | Suburban | Diffusion Tube | 100 | 100 | 23.4 | 18.7 | 20.3 | 18.1 | 21.2 |
| 3 | Suburban | Diffusion Tube | 100 | 100 | 21.1 | 17.3 | 18 | 15.4 | 19.3 |
| 4 | Suburban | Diffusion Tube | 100 | 100 | 30 | 24.1 | 24.1 | 20.9 | 29.2 |
| 5 | Suburban | Diffusion Tube | 100 | 100 | 36.7 | 25.3 | 33 | 25.9 | 29.9 |
| 6 | Suburban | Diffusion Tube | 100 | 100 | 15.5 | 13 | 12 | 10.4 | 13.5 |
| 7 | Roadside | Diffusion Tube | 100 | 100 | 46.2 | 36.1 | 37.8 | 31.9 | 33.5 |
| 8 | Roadside | Diffusion Tube | 100 | 100 | 28 | 23.5 | 23.4 | 18.4 | 23.3 |
| 9 | Roadside | Diffusion Tube | 100 | 100 | 30.4 | 22.8 | 26.7 | 21.4 | 25.4 |
| 10 | Suburban | Diffusion Tube | 100 | 100 | 17.7 | 17.1 | 16.7 | 12 | 18 |
| 11 | Rural | Diffusion Tube | 100 | 100 | 16.6 | 15 | 15.9 | 12.8 | 15.8 |
| 12 | Roadside | Diffusion Tube | 100 | 100 | 24.8 | 18 | 21.4 | 16.3 | 21.9 |
| 13 | Suburban | Diffusion Tube | 100 | 100 | 18.3 | 13.7 | 14.2 | 11.9 | 15.9 |
| 14 | Suburban | Diffusion Tube | 100 | 100 | 21.7 | 17.7 | 18.1 | 13.3 | 17 |

| | | | | | | | | | |
|----|----------|----------------|-----|------|-------------|------|------|------|------|
| 15 | Suburban | Diffusion Tube | 80 | 100 | - | 25.3 | 28.1 | 25.1 | 27.6 |
| 16 | Suburban | Diffusion Tube | 80 | 100 | - | 21 | 20.5 | 18.1 | 21.4 |
| 17 | Suburban | Diffusion Tube | 80 | 100 | - | 12.2 | 13.1 | 10.8 | 19.4 |
| 18 | Roadside | Diffusion Tube | 100 | 100 | 33.1 | 28.4 | 27.4 | 25.9 | 29.8 |
| 19 | Roadside | Diffusion Tube | 100 | 100 | 43.4 | 34.2 | 36.3 | 30.6 | 36.9 |
| 20 | Roadside | Diffusion Tube | 100 | 100 | 44.5 | 36.4 | 35.9 | 33.6 | 32.9 |
| 21 | Roadside | Diffusion Tube | 100 | 100 | 40.1 | 36.6 | 35.1 | 26.9 | 31.1 |
| 22 | Roadside | Diffusion Tube | 98 | 91.7 | 26.9 | 23.3 | 26.4 | 23.2 | 25.2 |
| 23 | Suburban | Diffusion Tube | 100 | 100 | 19.4 | 16.9 | 16.2 | 13 | 16.7 |
| 24 | Suburban | Diffusion Tube | 100 | 100 | 19.4 | 16.9 | 17.1 | 13.9 | 17.4 |
| 25 | Roadside | Diffusion Tube | 100 | 100 | - | 33 | 31.7 | 29.3 | 30.1 |
| 26 | Roadside | Diffusion Tube | 80 | 100 | - | 33 | 24.4 | 21.4 | 25.5 |
| 27 | Roadside | Diffusion Tube | 100 | 100 | 32.7 | 29 | 28.3 | 23.1 | 28.4 |
| 28 | Suburban | Diffusion Tube | 40 | 100 | - | - | - | 16.3 | 14.1 |
| 29 | Roadside | Diffusion Tube | 100 | 100 | 44.9 | 38.9 | 38.6 | 31.8 | 38.2 |
| | | | | | | | | | |
| | | | | | | | | | |

☒ Diffusion tube data has been bias corrected

- ☒ **Annualisation has been conducted where data capture is <75%**
- ☒ **If applicable, all data has been distance corrected for relevant exposure**

Notes:

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

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

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2016

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

| Site ID | NO ₂ Mean Concentrations (µg/m ³) | | | | | | | | | | | | | | |
|---------|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-------------|--|---|
| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual Mean | | |
| | | | | | | | | | | | | | Raw Data | Bias Adjusted (0.94) and Annualised ⁽¹⁾ | Distance Corrected to Nearest Exposure ⁽²⁾ |
| | | | | | | | | | | | | | | | |
| 1 | 30 | 23 | 19 | 13 | 22 | 14 | 17 | 17 | 25 | 21 | 25 | 32 | 22 | 20.21 | 20.21 |
| 2 | 27 | 28 | 16 | 16 | 21 | 17 | 24 | 21 | 25 | 19 | 27 | 29 | 23 | 21.15 | 21.15 |
| 3 | 26 | 25 | 21 | 13 | 21 | 16 | 17 | 15 | 23 | 19 | 23 | 27 | 21 | 19.27 | 19.27 |
| 4 | 30 | 40 | 39 | 20 | 33 | 24 | 22 | 21 | 31 | 37 | 39 | 37 | 31 | 29.2183333 | 29.2183333 |
| 5 | 40 | 33 | 30 | 17 | 31 | 27 | 30 | 27 | 40 | 35 | 34 | 37 | 32 | 29.845 | 29.845 |
| 6 | 19 | 17 | 14 | 10 | 14 | 10 | 10 | 9 | 17 | 14 | 16 | 22 | 14 | 13.4733333 | 13.4733333 |
| 7 | 45 | 47 | 49 | 37 | 44 | 37 | 41 | 38 | 46 | 43 | 41 | 45 | 43 | 40.185 | 33.5 |
| 8 | 26 | 30 | 27 | 15 | 24 | 20 | 19 | 17 | 28 | 27 | 31 | 34 | 25 | 23.3433333 | 23.3 |
| 9 | 37 | 33 | 30 | 12 | 26 | 18 | 22 | 21 | 27 | 28 | 31 | 39 | 27 | 25.38 | 25.4 |
| 10 | 22 | 21 | 22 | 15 | 21 | 12 | 12 | 12 | 23 | 21 | 22 | 27 | 19 | 18.0166667 | 18.0 |
| 11 | 20 | 19 | 15 | 11 | 17 | 12 | 11 | 10 | 23 | 17 | 20 | 26 | 17 | 15.745 | 15.7 |
| 12 | 26 | 27 | 23 | 12 | 22 | 20 | 22 | 19 | 30 | 24 | 25 | 29 | 23 | 21.855 | 21.9 |
| 13 | 23 | 19 | 16 | 11 | 16 | 12 | 12 | 11 | 22 | 13 | 20 | 28 | 17 | 15.9016667 | 15.9 |
| 14 | 21 | 22 | 19 | 14 | 18 | 15 | 14 | 10 | 18 | 16 | 23 | 27 | 18 | 16.9983333 | 17.0 |
| 15 | 30 | 33 | 29 | 15 | 34 | 23 | 29 | 24 | 33 | 29 | 36 | 37 | 29 | 27.5733333 | 27.6 |

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|----|-----------|-----------|-----------|----|-----------|----|----|----|-----------|-----------|-----------|-----------|-----------|------------|------|
| 16 | 29 | 26 | 25 | 13 | 22 | 17 | 20 | 18 | 25 | 21 | 27 | 30 | 23 | 21.385 | 21.4 |
| 17 | 21 | 12 | 15 | 15 | 22 | 19 | 19 | 17 | 25 | 24 | 28 | 30 | 21 | 19.3483333 | 19.3 |
| 18 | 38 | 28 | 35 | 22 | 31 | 27 | 25 | 25 | 36 | 38 | 37 | 38 | 32 | 29.7666667 | 29.8 |
| 19 | 41 | 43 | 40 | 23 | 42 | 35 | 37 | 32 | 48 | 44 | 42 | 43 | 39 | 36.8166667 | 36.8 |
| 20 | 46 | 52 | 27 | 20 | 41 | 36 | 28 | 25 | 37 | 32 | | 41 | 35 | 32.9 | 32.9 |
| 21 | 32 | 37 | 40 | 19 | 33 | 30 | 30 | 29 | 36 | 41 | 36 | 34 | 33 | 31.0983333 | 31.1 |
| 22 | 27 | 30 | 48 | 20 | 23 | 20 | 19 | 18 | 30 | 29 | 26 | 31 | 27 | 25.145 | 25.1 |
| 23 | 24 | 21 | 17 | 12 | 17 | 12 | 13 | 11 | 21 | 16 | 22 | 27 | 18 | 16.685 | 16.7 |
| 24 | 19 | 22 | 17 | 15 | 20 | 14 | 12 | 13 | 20 | 22 | 21 | 27 | 19 | 17.39 | 17.4 |
| 25 | 36 | 37 | 31 | 15 | 30 | 26 | 33 | 29 | 42 | 31 | 36 | 38 | 32 | 30.08 | 30.1 |
| 26 | 37 | 32 | 26 | 17 | 24 | 19 | 24 | 21 | 32 | 27 | 30 | 36 | 27 | 25.4583333 | 25.5 |
| 27 | 26 | 33 | 36 | 21 | 36 | 16 | 26 | 26 | 32 | 44 | 35 | 31 | 30 | 28.3566667 | 28.4 |
| 28 | 32 | 19 | 14 | 9 | 11 | 9 | 10 | 10 | 15 | 12 | 17 | 22 | 15 | 14.1 | 14.1 |
| 29 | 46 | 43 | 42 | 18 | 46 | 35 | 38 | 35 | 47 | 43 | 44 | 50 | 41 | 38.1483333 | 38.1 |
| | | | | | | | | | | | | | | | |

☐ Local bias adjustment factor used

☒ National bias adjustment factor used

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

Notes:

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

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

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

(2) Distance corrected to nearest relevant public exposure.

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

QA/QC of Diffusion Tube Monitoring

The diffusion tubes are supplied by Gradko Environmental, part of Gradko International Ltd. They consist of 20% TEA (Triethanolamine) in deionised water. Once received by post the tubes are stored in a refrigerator until required. Once the tubes have been placed in their holders, the end caps are removed and the tubes exposed for a month. At the end of the period the tubes are recapped and retrieved and stored in the refrigerator until returned by post to the laboratory for analysis. A travel blank is used. This travels everywhere with the exposed tubes but is not itself exposed. It is stored in the refrigerator and sent for analysis with the exposed tubes. Its purpose is to check on contamination of the tubes.

Gradko International is accredited by UKAS for the analysis of NO₂. Gradko also take part in the AIR NO₂ Proficiency Testing Scheme on a quarterly basis. Their AIR results over the last twelve rounds of testing gave 100% laboratory performance in terms of the accuracy and precision of results (Summary of Laboratory Performance in AIR NO₂ Proficiency Testing Scheme (April 2015 – February 2017))

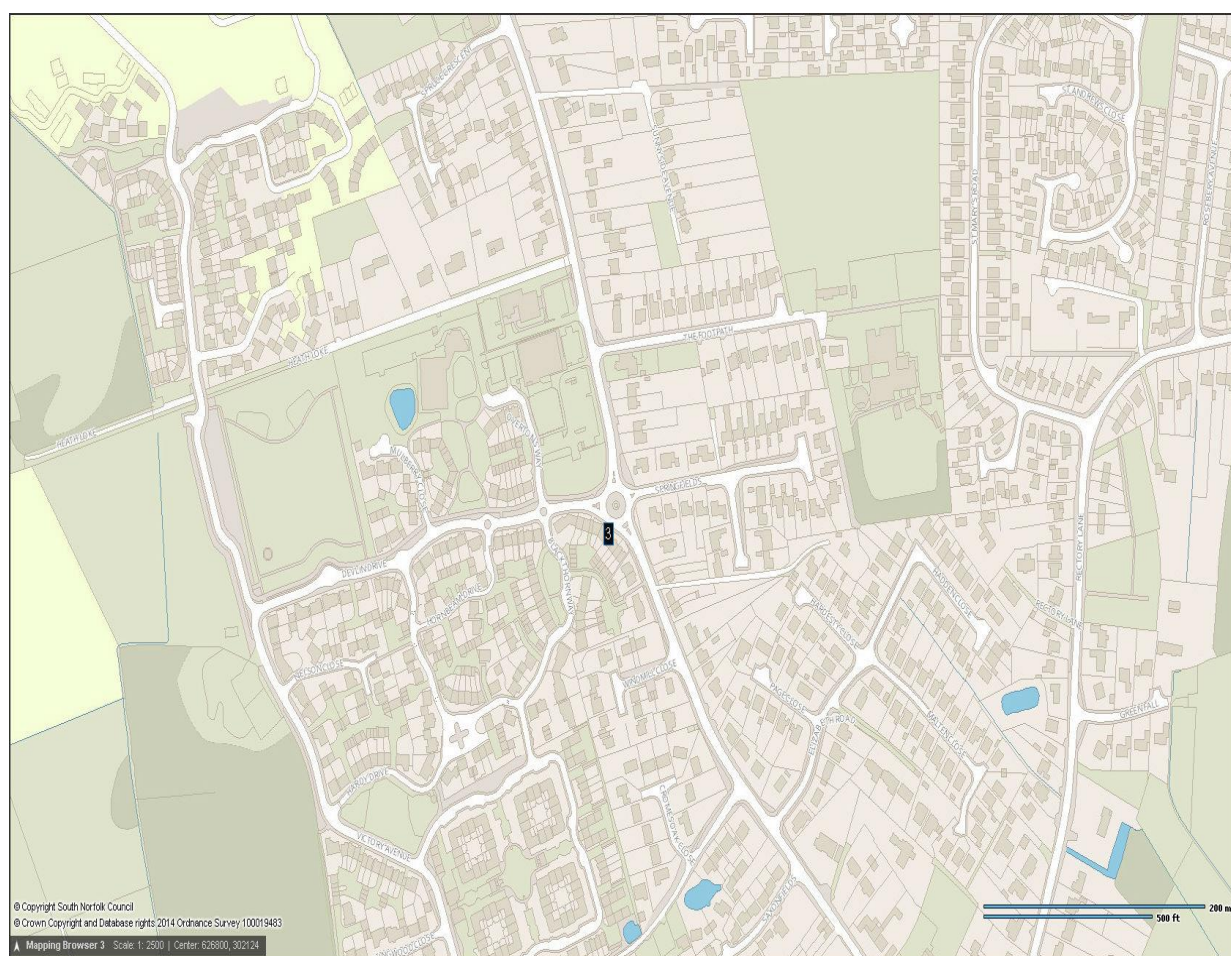
Diffusion Tube Bias Adjustment Factors

The National bias adjustment factor for the period was 0.94 (Spreadsheet Version 2 3/17)

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

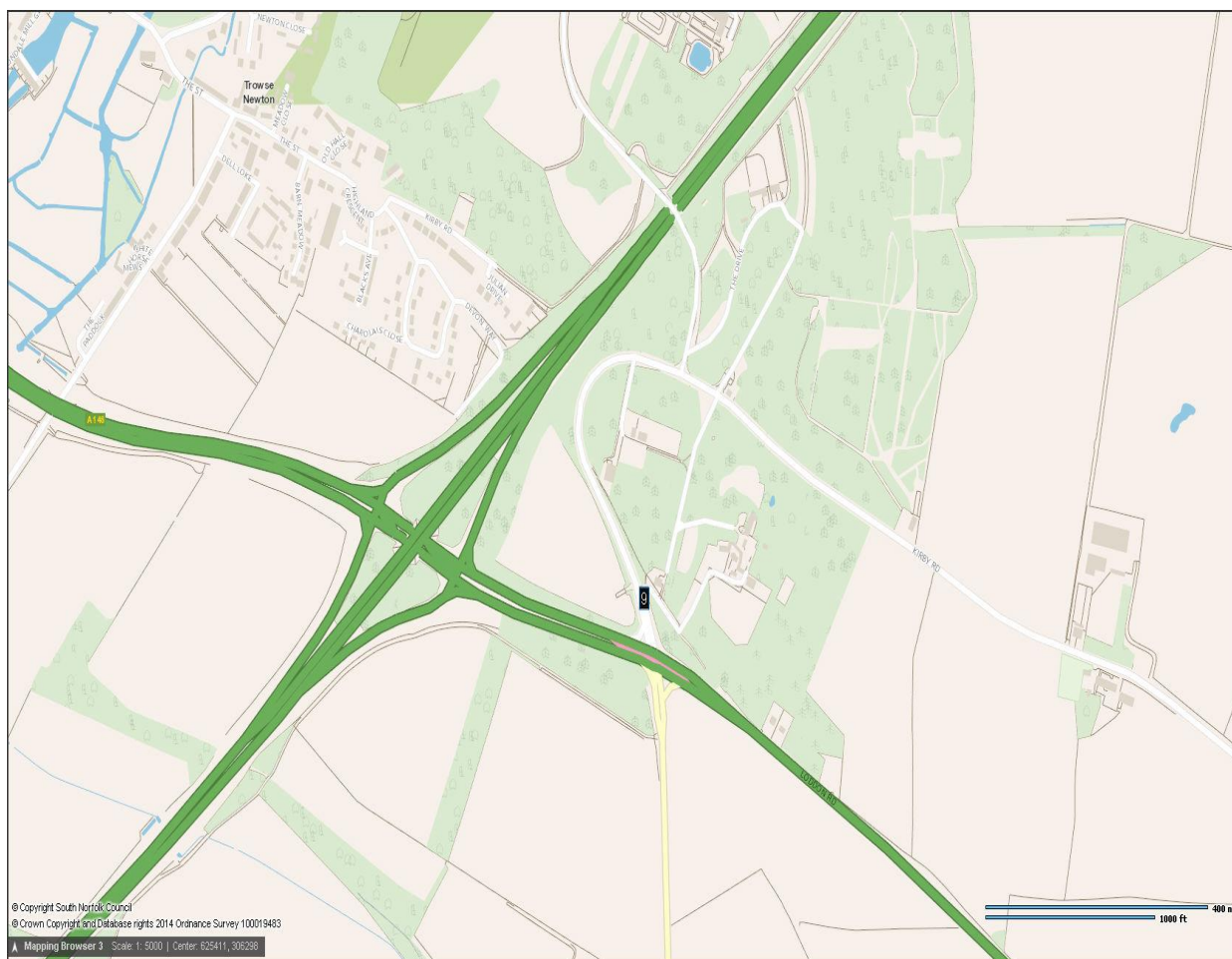
Poringland

| Tube I.D. | Location | Height | Grid |
|-----------|------------------------------|--------|-----------------|
| 3 | On Drain pipe Poringland. | 1.5m | 0626803 0302092 |



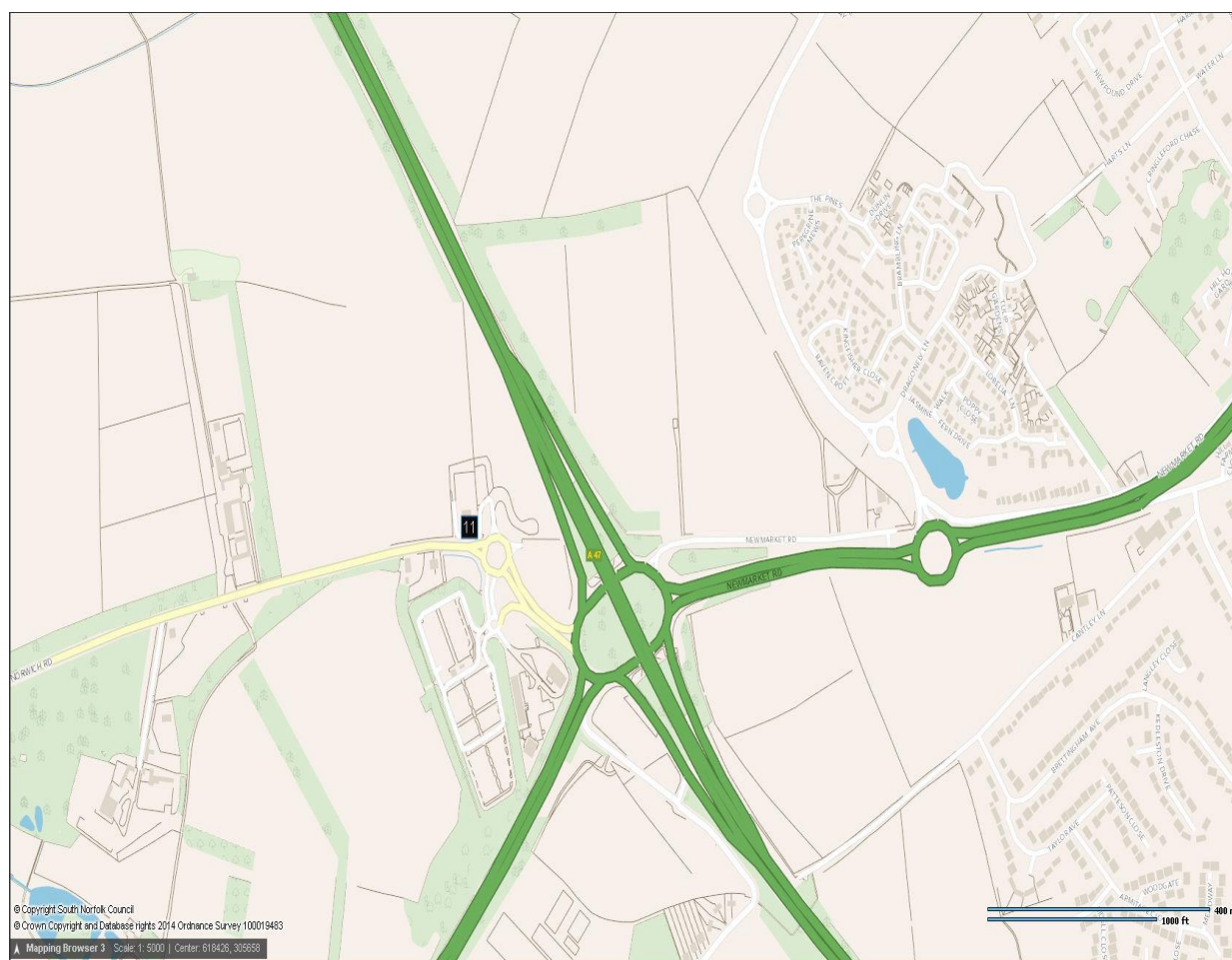
Bixley

| Tube I.D. | Location | Height | Grid |
|-----------|-----------------------------|--------|-----------------|
| 9 | Kirby Bedon Road Bixley. | 2.1 | 0625439 0305944 |



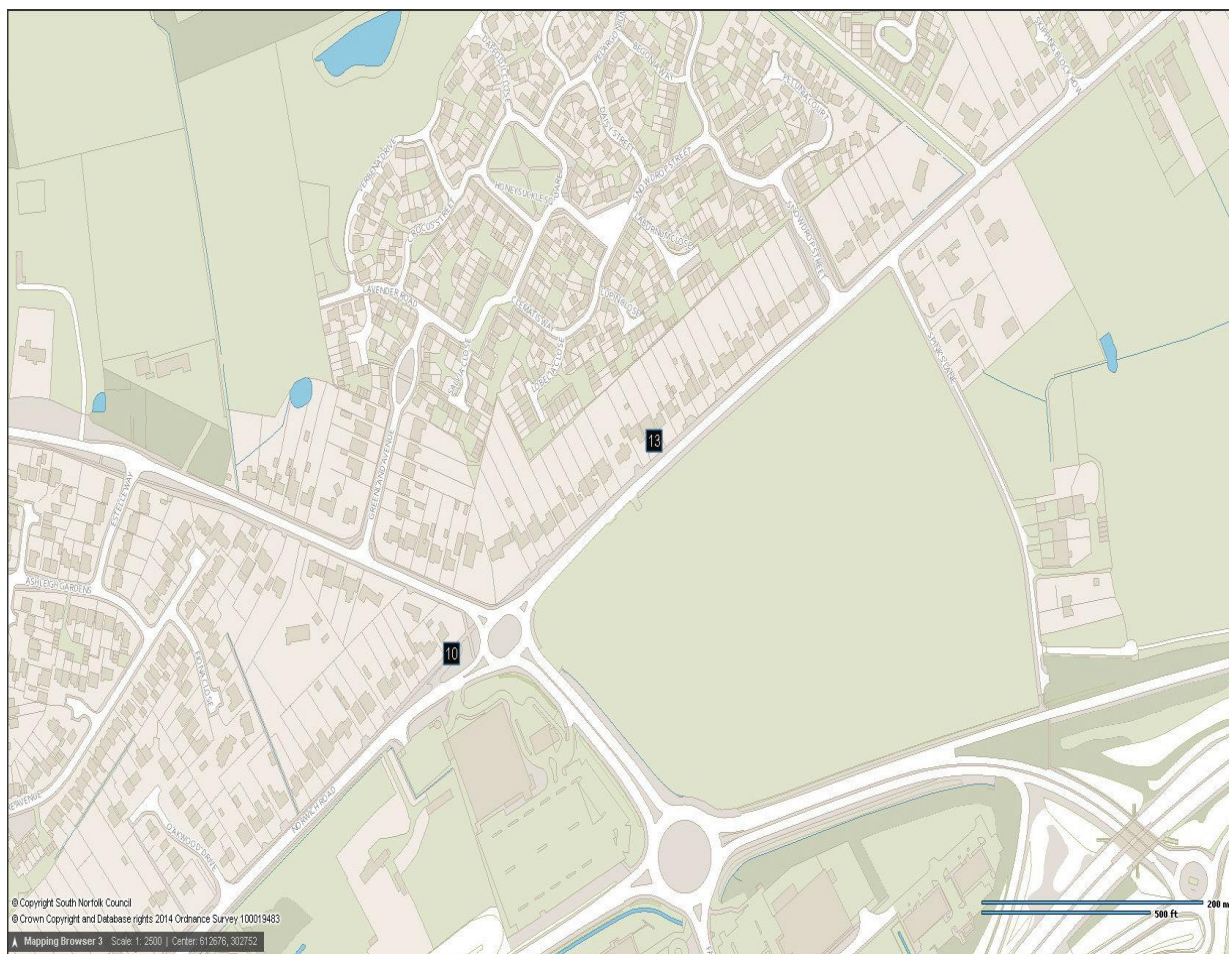
Thickthorn Roundabout A11

| Tube I.D. | Location | Height | Grid |
|-----------|-----------------------|--------|-----------------|
| 11 | 2 THICKTHORN COTTAGES | 2.1 | 0618137 0305678 |



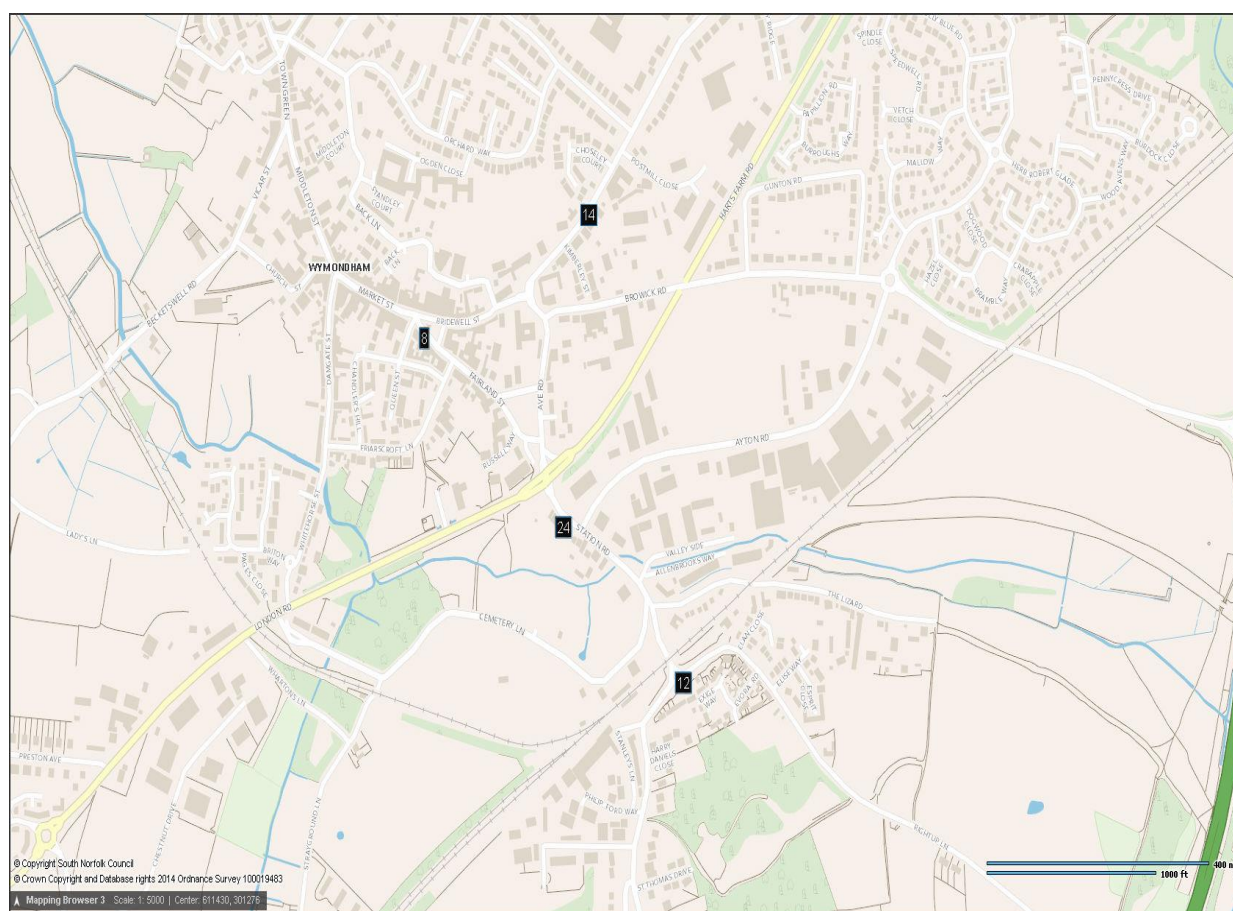
Wymondham

| Tube I.D. | Location | Height | Grid |
|-----------|-------------------------------|--------|-----------------|
| 10 | 209 Norwich Wymondham | 1.5 | 0612515 0302652 |
| 13 | 233 Norwich Road Wymondham | 1.8 | 06126630302751 |



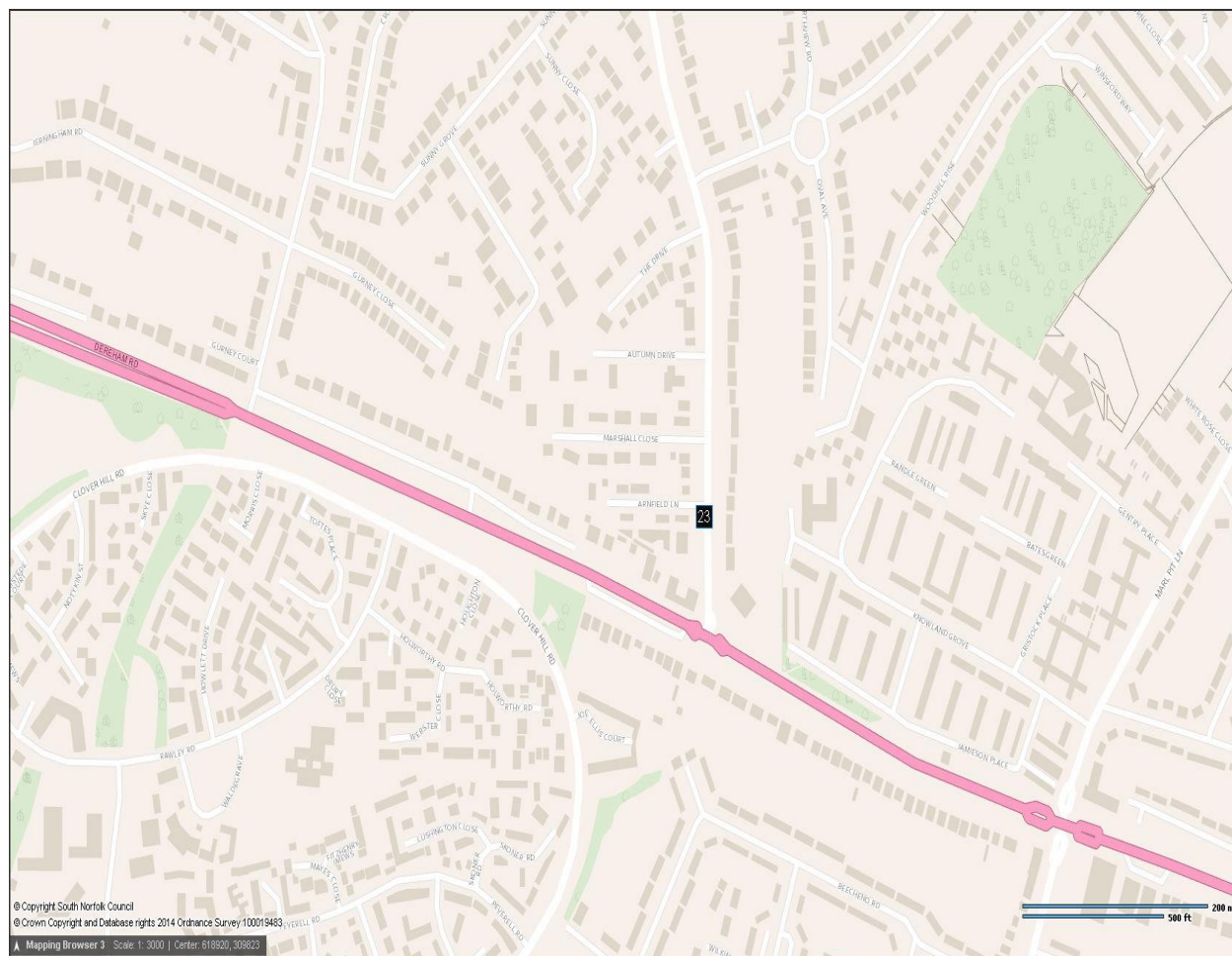
Wymondham

| Tube I.D. | Location | Height | Grid |
|-----------|------------------------|--------|-----------------|
| 8 | Fairland, Wymondham | 2.1 | 0611129 0301425 |
| 12 | Right up Lane | 2.1 | 0611528 0300987 |
| 14 | 28 Norwich Road | 1.5 | 0611380 0301638 |
| 24 | 14 Station Rd | 1.5 | 0611323 0301190 |



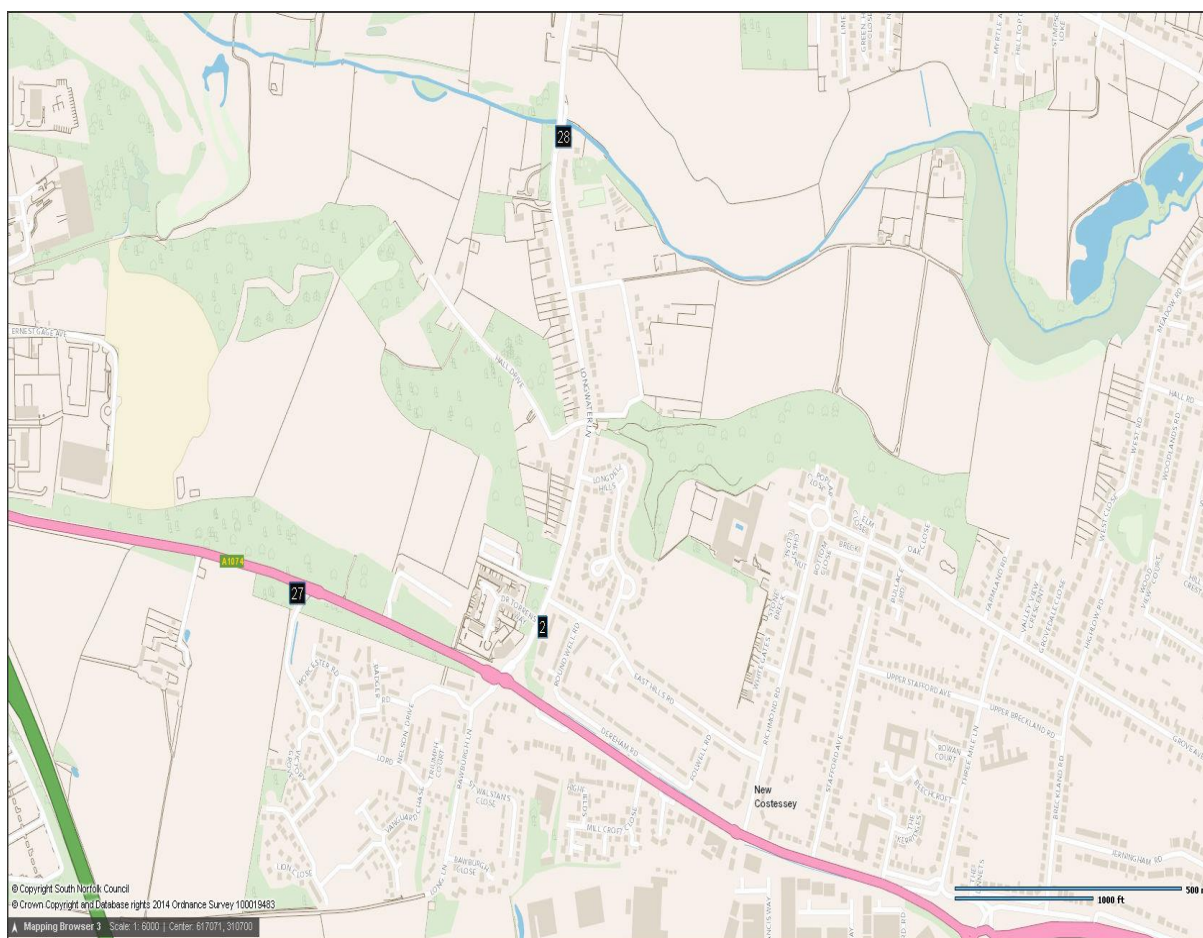
Costessey

| Tube I.D. | Location | Height | Grid |
|-----------|-----------------------------|--------|-----------------|
| 23 | 3 Norwich Road Costessey | 1.5 | 0618991 0309796 |



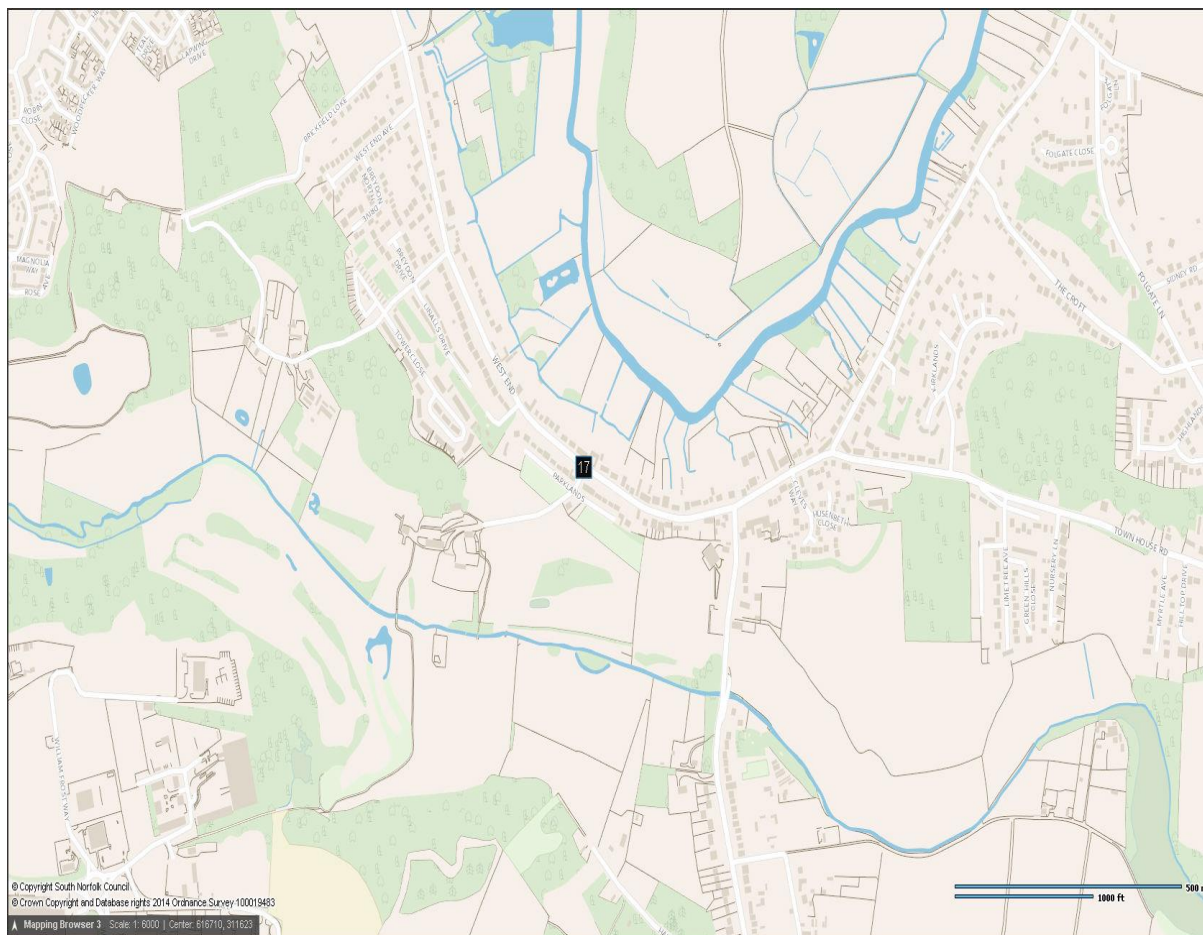
Costessey

| Tube I.D. | Location | Height | Grid |
|-----------|-----------------------------|--------|-----------------|
| 2 | 131 Longwater Lane | 1.5 | 0616797 0310477 |
| 27 | Lord Nelson Drive | 2.1 | 0616348 0310585 |
| 28 | 2 Riverside Court Costessey | 1.5 | 0 0310585616386 |



Costessey

| Tube I.D. | Location | Height | Grid |
|-----------|--------------------------|--------|-----------------|
| 17 | 84 West End Costessey | 2.1 | 0616652 0311650 |



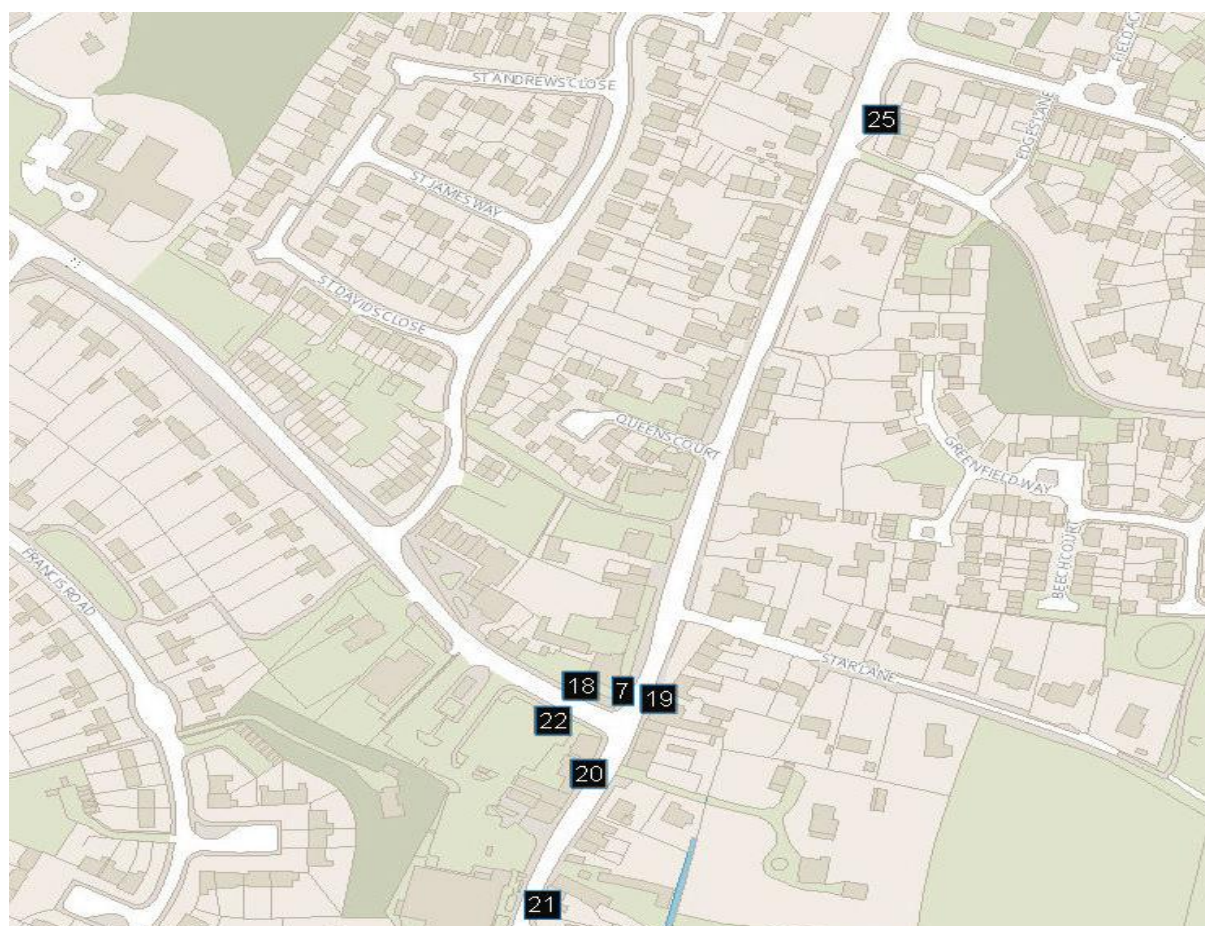
Cringleford

| Tube I.D. | Location | Height | Grid |
|-----------|-------------------------------------|--------|-----------------|
| 1 | 46a Old Newmarket Road, Cringleford | 1.5 | 0619208 0304645 |
| 26 | Newmarket Road, Cringleford | 2.1 | 0619801 0305859 |



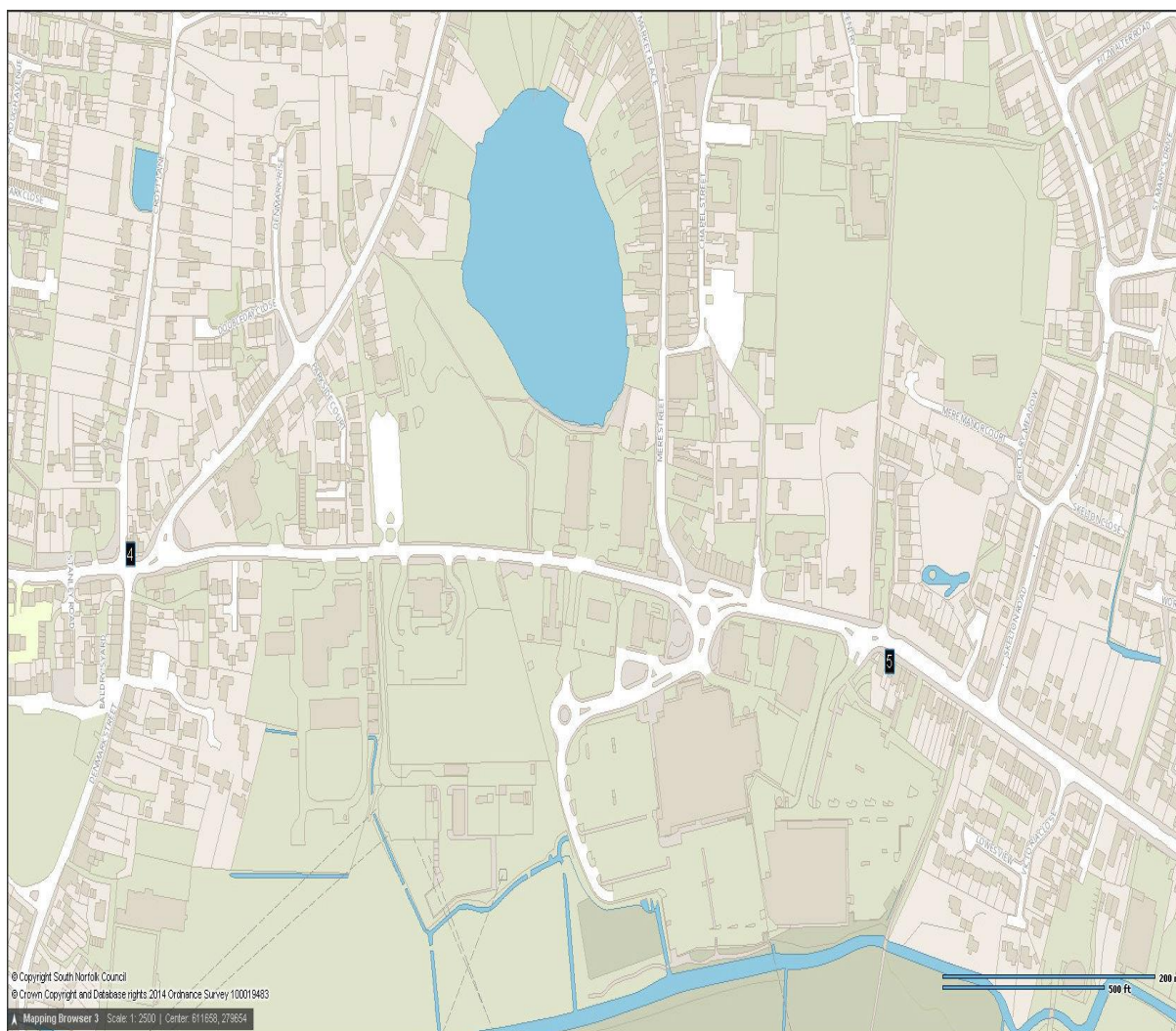
Long Stratton

| Tube I.D. | Location | Height | Grid |
|-----------|---|--------|-----------------|
| 7 | A140 Long Stratton | 2.1 | 0619722 0292745 |
| 18 | Chinese Long Stratton | 2.1 | 0619710 0292730 |
| 19 | Traffic Light East | 2.1 | 0619732 0292740 |
| 20 | Outside the chemist Long Stratton | 2.1 | 0619706 0292724 |
| 21 | Long Stratton 60 mtr from centre Southbound | 2.1 | 0619694 0292653 |
| 22 | Long Stratton, CO-OP Swan Lane, | 2.1 | 0619710 0292722 |
| 25 | Bus Stop, Norwich Road, Long Stratton | 2.1 | 0619823 0293032 |



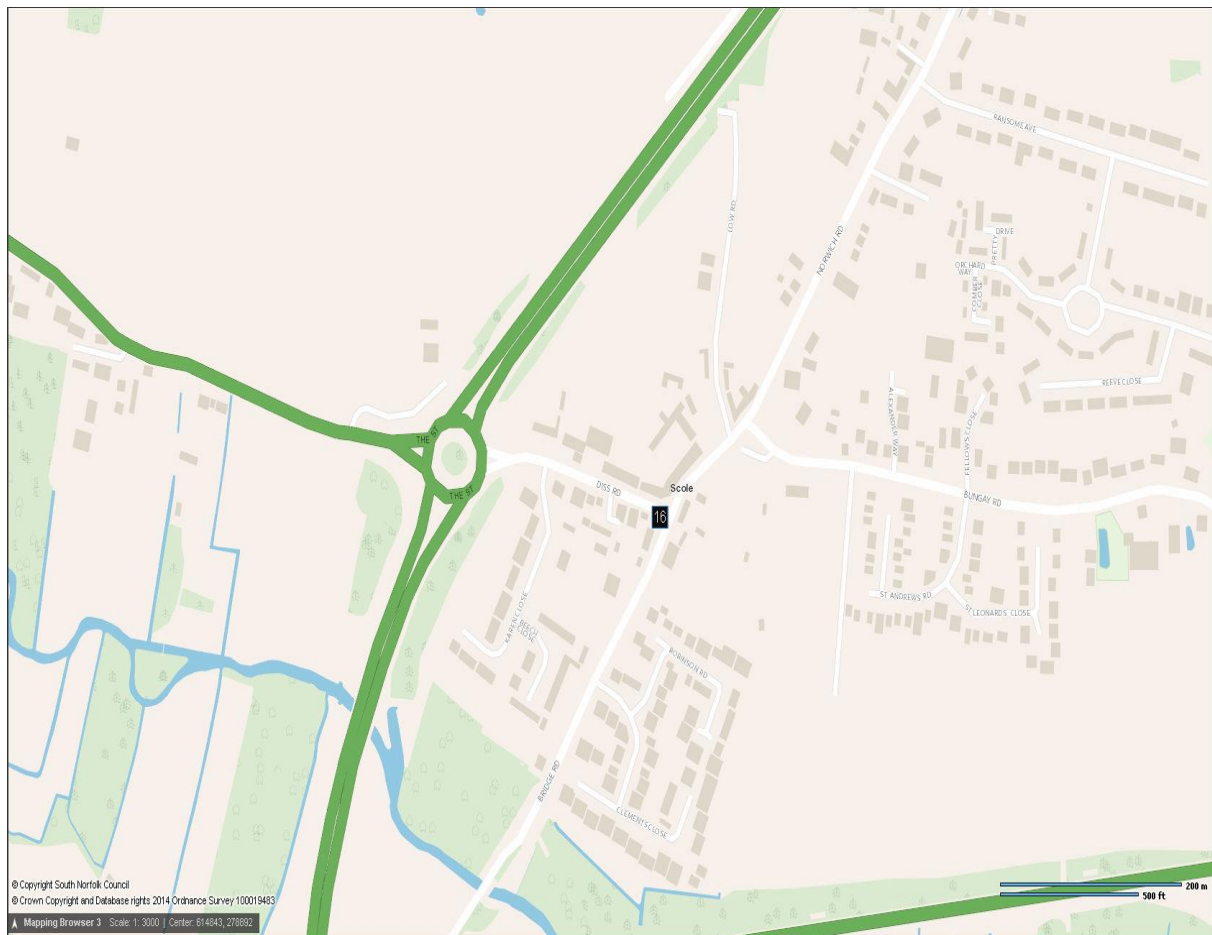
Diss

| Tube I.D. | Location | Height | Grid |
|-----------|-------------------------|--------|-----------------|
| 4 | 87 Denmark Street, Diss | 1.5 | 0611223 0279637 |
| 5 | 131 Victoria Diss | 1.8 | 0611945 0279572 |



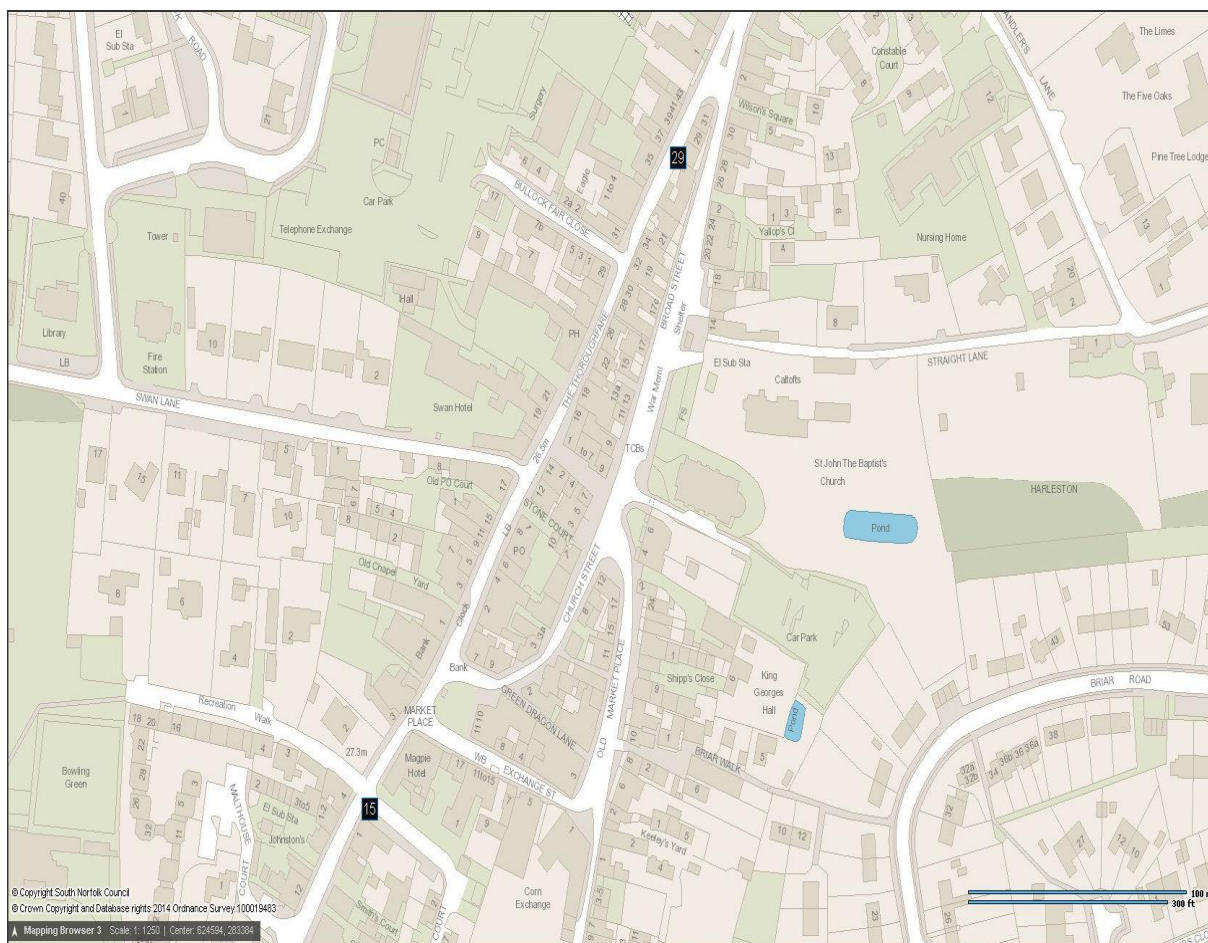
Scale

| Tube I.D. | Location | Height | Grid |
|-----------|-------------------|-----------------|------|
| 16 | Diss Road , Scale | 0614895 0278864 | 1.8 |



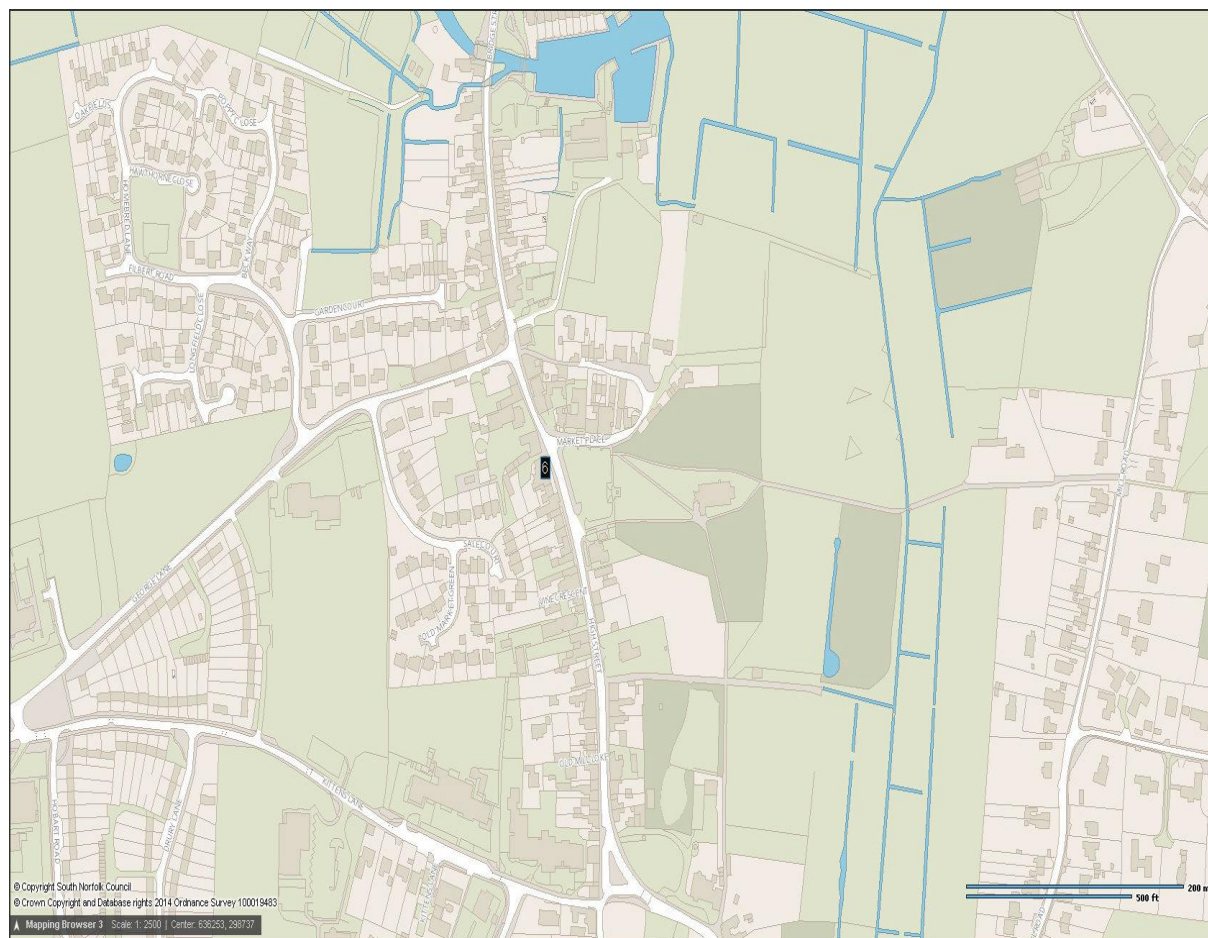
Harleston

| Tube I.D. | Location | Height | Grid |
|-----------|------------------------------|--------|-----------------|
| 15 | Harleston (Hotel) | 2.1 | 0624484 0283276 |
| 29 | 25 Broad Street Harleston | 1.5 | 0615754 0310637 |



Loddon

| Tube I.D. | Location | Height | Grid |
|-----------|----------------------------|--------|-----------------|
| 6 | 21 Church Plain, Loddon | 1.5 | 0636192 0298751 |



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

| Pollutant | Air Quality Objective ⁴ | |
|--|--|----------------|
| | Concentration | Measured as |
| Nitrogen Dioxide (NO ₂) | 200 µg/m ³ not to be exceeded more than 18 times a year | 1-hour mean |
| | 40 µg/m ³ | Annual mean |
| Particulate Matter (PM ₁₀) | 50 µg/m ³ , not to be exceeded more than 35 times a year | 24-hour mean |
| | 40 µg/m ³ | Annual mean |
| Sulphur Dioxide (SO ₂) | 350 µg/m ³ , not to be exceeded more than 24 times a year | 1-hour mean |
| | 125 µg/m ³ , not to be exceeded more than 3 times a year | 24-hour mean |
| | 266 µg/m ³ , not to be exceeded more than 35 times a year | 15-minute mean |

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

| Abbreviation | Description |
|-------------------|---|
| AQAP | Air Quality Action Plan - A detailed description of measures, outcomes, achievement dates and implementation methods, showing how the local authority intends to achieve air quality limit values' |
| AQMA | Air Quality Management Area – An area where air pollutant concentrations exceed / are likely to exceed the relevant air quality objectives. AQMAs are declared for specific pollutants and objectives |
| ASR | Air quality Annual Status Report |
| Defra | Department for Environment, Food and Rural Affairs |
| 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 ₂ | Nitrogen Dioxide |
| NO _x | Nitrogen Oxides |
| PM ₁₀ | Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less |
| PM _{2.5} | Airborne particulate matter with an aerodynamic diameter of 2.5µm or less |
| QA/QC | Quality Assurance and Quality Control |
| SO ₂ | Sulphur Dioxide |
| ... | ... |