Doncaster Council

2019 Air Quality Annual Status Report (ASR)

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

June 2019

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Executive Summary: Air Quality in Our Area

Air Quality in Doncaster

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 billion[3].

There are seven areas of poor air quality in Doncaster, these Air Quality Management Areas (AQMAs) are declared due to the pollutant nitrogen dioxide. In 2019 the declaration of a further area of poor air quality close to AQMA7 will be made. The village of Marr exceeds the nitrogen dioxide annual average and traffic emissions are the source of this exceedance.

There are no other pollutants in Doncaster that exceed the air quality objectives. A decline in concentrations of nitrogen dioxide over the last 5 – 10 years can be observed in many places across the Borough and particularly in 2018 however parts of the Borough continue to exceed.

The 7 AQMAs are located near busy roads in the following areas; Town Centre along Church Way, Balby A630, Hyde Park along Carr House Road A18, Bawtry Road M18/A638, Conisbrough A630/Low Road, Skellow along the A1 and Hickleton A635. An action plan is in place bringing forward measures to work towards reducing emissions and ultimately achieving compliance with the objectives.

There are no new major sources of pollutionin Doncaster that will have a significant impact on the achievement of the air quality objectives however all new proposals are expected to mitigate emissions in line with current best practice thereby minimising cumulative impacts.

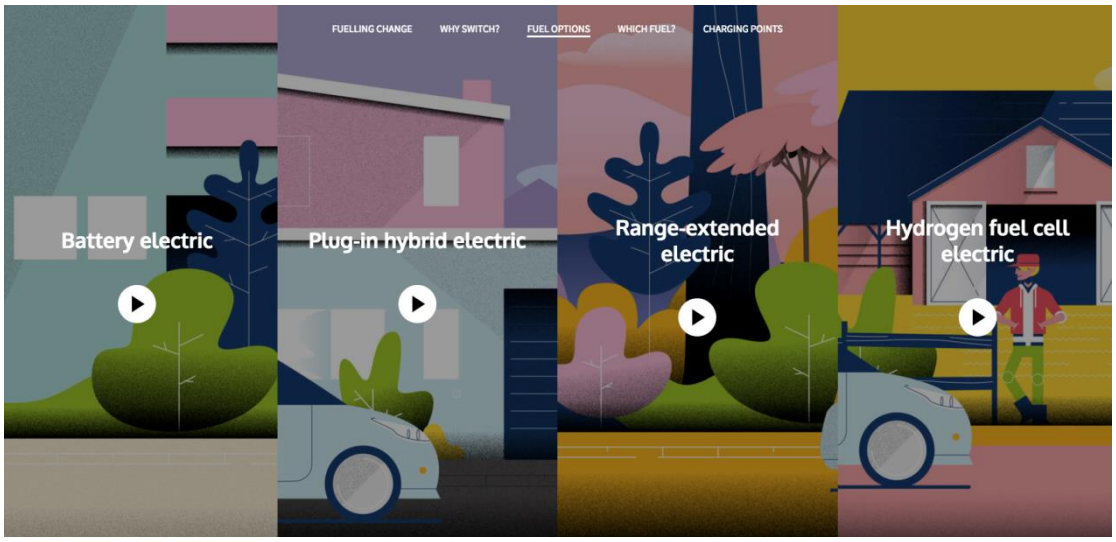
[1] Environmental equity, air quality, socioeconomic status and respiratory health, 2010
[2] Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006
[3] Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Actions to Improve Air Quality

The Air Quality Action Plan (AQAP) measures are progressing and the Steering Group continues to meet regularly to discuss new measures and progress.

Through-out 2018 the Fuelling Change Campaign, funded via the Air Quality Grant, delivered events and website resources (www.fuellingchange.co.uk) to the residents of Doncaster and the wider South Yorkshire area. The scheme was a success and the information is still online, providing facts about alternative fuelled vehicles and helping the Council establish an evidence base of the perceived barriers across the region to the up-take of Ultra- Low Emission Vehicles (ULEV).

Fuelling Change Campaign website, www.fuellingchange.co.uk, 2018



ECO stars continued to engage with the HGV fleet operators with a particular focus on Doncaster.

A large number of active travel schemes continue to be implemented and strategies on walking and cycling are in place with implementation underway.

Traffic management programmes are in place aiming to reduce congestion from planned maintenance and roadwork's and 20mph zones, especially around schools have been rolled out.

Doncaster Council will continue to engage and develop our links with key partners to help deliver better air quality, including working with the Sheffield City Region (SCR), Highways England and local businesses and communities.

Summary of Action Plan – Key Points

ACTION FOR AIR QUALITY

The Air Quality Action Plan

EDUCATION

Doncaster Council heads up Fuelling Change to help South Yorkshire residents understand alternative fuelled vehicles.

ADVISE BUSINESS

ECOstars recognises good fleet practices and helps businesses reduce emissions.

ECO Stars®

CYCLING & WALKING

Investing in our walking and cycling infrastructure so residents can choose active travel over the car whenever suitable.

PLANNING GUIDANCE

Reviewing planning applications and requiring developments to consider air quality mitigation such as EV charging points.

QUALITY BUS PARTNERSHIP

Working to improve emissions from the local bus fleet.

www.doncaster.gov.uk/airquality

Conclusions and Priorities

This year's ASR confirms that the status of the AQMAs remains valid. The data from 2018 does not indicate any new exceedances outside of the AQMAs. A number of locations revealed a decrease in concentrations on the previous year and over the longer term the trend shows that levels are reducing slowly in many areas. Compliance with the air quality objectives has not been achieved in the AQMAs and some areas are not likely to meet the objectivesin the short-term.

The priority for the Council is to continue to implement the measures in the air quality action plan and identify further measures that could bring forward compliance, in particular facilitating the change to cleaner vehicles and active travel.

The risks remain the same as in many other Council areas and are mainly of funding and resource issues. The Clean Air Zones (CAZ) are being implemented over the next 1-2 years and the impact of this on areas without CAZ, such as Doncaster, is still unknown and one the Council is monitoring.

Local Engagement and How to get Involved

Doncaster Council publishes the ASR and AQAP on its website. Daily air quality information is published via websites, twitter, newspapers and on local radio as a way to inform residents, schools and businesses of the current levels of air quality. Doncaster Council also engages with a small number of Parish Councils and residents on air quality matters specific to their areas.

A steering group, made up of departments from across the Council, oversees the production and implementation of the Air Quality Action Plan. This group will be widened out to involve other stakeholders over the coming year. The Council currently engages with South Yorkshire Passenger Transport Executive and as such bus operators, the Sheffield City Region and individual South Yorkshire Councils and to some extent Highways England. Doncaster Council is also an active member of the Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG).

Local residents, businesses and organisations are key to improving air quality. Individuals can improve air quality by considering the mode of travel they choose carefully, considering purchasing vehicles with the best environmental benefits where possible, sharing knowledge and reducing domestic emissions by considering the impact of choices of heating on the local environment.

Further information can be obtained via www.doncaster.gov.uk or through the contact details at the front of this report.

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1 Local Air Quality Management

This report provides an overview of air quality in Doncaster 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 Doncaster 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 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.

A summary of AQMAs declared by Doncaster can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=80. Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides a map of air quality monitoring locations in relation to the AQMA(s).

The new AQMA at Marr will be formally declared in 2019, a location map of this AQMA can be found in Appendix D.

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
AQMA1	Declared August 1st 2001	NO2 Annual Mean	Doncaster	An area along Church Way through the town centre of Doncaster encompassing the main shopping precinct, transport interchange, college and residential properties.	NO	53	µg/m3	41	µg/m3	Doncaster Air Quality Action Plan 2018	Jun-18	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public

AQM A2	Declared August 1st 2001	NO2 Annual Mean	Doncaster	An area along the A630 from Balby to the A1 at Warmsworth emcompassing residentail properties.	YES	53	µg/m3	57	µg/m3	Doncaster Air Quality Action Plan 2018	Jun-18	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public
AQM A3	Declared August 1st 2001	NO2 Annual Mean	Doncaster	An area encompassing residential properties along the A18.	NO	43	µg/m3	37	µg/m3	Doncaster Air Quality Action Plan 2018	Jun-18	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public
AQM A4	Declared June 1st 2003	NO2 Annual Mean	Doncaster	An area encompassing a residential estate following the M18 where it crosses the A638.	YES	43	µg/m3	41	µg/m3	Doncaster Air Quality Action Plan 2018	Jun-18	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public
AQM A5	Declared April 1st 2012	NO2 Annual Mean	Doncaster	A residential area along the A630 in Conisbrough including the junction with Low Road.	YES	49	µg/m3	46	µg/m3	Doncaster Air Quality Action Plan 2018	Jun-18	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public

AQAM6	Declared December 1st 2013	NO2 Annual Mean	Doncaster	A residential area along the A1.	YES	51	µg/m3	48	µg/m3	Doncaster Air Quality Action Plan 2018	Jun-18	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public
AQMA7	Declared February 1st 2014	NO2 Annual Mean	Doncaster	A village with residential properties along the A635.	YES	86	µg/m3	91	µg/m3	Doncaster Air Quality Action Plan 2018	Jun-18	http://www.doncaster.gov.uk/services/environmental/air-quality-reports-available-to-the-public

☒ **Doncaster Council confirm the information on UK-Air regarding their AQMA(s) is up to date**

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

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, with the provisos listed in the commentary below.'

The main points include further investigation into some of the AQMAs which existing monitoring indicated may have achieved the objectives and could be considered for revocation. A rolling programme of monitoring has been put in place and the results are discussed within this report.

The final version of the Air Quality Action Plan was also the focus of comments including the requirement for additional information on the likely impact of the measures. The AQAP is now available and the points addressed within.

Doncaster Council has taken forward a number of direct measures during the current reporting year of 2019 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

More detail on these measures can be found in their respective Action Plans. Key completed measures are:

- Measure no.1 Fuelling Change Campaign. The Campaign has been successful in obtaining a very useful picture of the local, Sheffield City Region, attitudes to Ultra Low Emission Vehicles (ULEV). The survey work showed a generally positive attitude to electric vehicles and highlighted the main perceived barriers to uptake. The final report has been attached to the appendices, Figure A1 details the key facts about the scheme, in summary the KPIs were achieved in all cases and often well in excess of the targets.

Figure: A1 Fuelling Change

and - Measure no.3 Air Quality Technical Planning Guidance.

Doncaster Council expects the following measures to be completed over the course of the next reporting year:

- Measure no.2 ECO stars Fleet Recognition Scheme including business case, Taxi scheme and Non-road mobile machinery guidance and;

- Measure no.5 Sustainable Travel Access Fund Projects

Doncaster Council's priorities for the coming year are focused on the development of new measures as part of the wider SCR plans and other local policy decisions as follows;

- Transforming Cities Fund first tranche award of £1.26M across SCR to be spent on active travel. Plans currently include infrastructure for cycling in the town centre, the 'Y' routes taking in major employment sites and crossing schemes. Further bids could provide funding up to £40M for Doncaster, half of which will focus on active travel in 3 corridors and will include train stations and walking, quality streets and further connections to large employment sites.

- The Motorway Road Network (MRN) is a contributor to local road traffic, sometimes with significant numbers of vehicles cutting through the Borough to access the motorways. In particular this is an issue for AQMA7 at Hickleton and the soon to be declared AQMA at Marr. As such, an agreement between Doncaster Council and partners has been reached to fund a feasibility study into a bypass along part of the A635. A bypass would have a significant impact on these AQMAs and therefore this feasibility study will be included in the AQAP as the main measure for dealing with the exceedance in those locations which we acknowledge would not achieve compliance within the lifetime of this plan otherwise.

- Barnsley and Doncaster Councils have successfully obtained Air Quality Grant funding for a new project. ECO driver training for the grey fleet will be offered across both areas. The tender process is currently underway and contracts will be in place for the beginning of July. The project will comprise a new measure in the next ASR.

- A further new measure to be included will be the Councils policy on developing local EV Charging Infrastructure. The internal processes are being developed but it is hoped that a plan will be included in the next ASR.

The principal challenges and barriers to implementation that Doncaster Council anticipates facing are funding and resource issues. A further risk is the impact of the Clean Air Zones (CAZ) in relation to displacing older vehicles, particularly bus fleets, into Doncaster.

Doncaster Council anticipates that the measures stated above and in Table 2.2 will achieve compliance by 2022 in AQMA1, 3, 4 and 5.

Whilst the measures stated above and in Table 2.2 will help to contribute towards compliance, Doncaster Council anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of AQMA2, 6 and 7.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Fuelling Change Campaign	Public Information	Via other mechanisms	Doncaster Council (Defra Funded)	April - June 2017	July 2017 - March 2018	Video views - 3239 (target 500) Web visits - 575 (target 500)	Low	Campaign successful. Final report in appendices. Measure to be removed in 2020.	Mar-19	Procurement and Supplier Issues
2	ECO stars Fleet Recognition Scheme	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	South Yorkshire Steering Group (Access Fund)	pre-2016	July 2017 - March 2020	No. of scheme members.	Low	173 members 12911 Vehicles registered. Measure to be removed in 2020.	Jun-19	Funding streams ceasing.
3	Air Quality Planning and Technical Guidance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Doncaster Council (Environmental Protection Budget)	April 2017 - June 2017	July 2017 - June 2020	% of applications with air quality mitigation included.	Low	All relevant applications now screened with this guidance.	June 2020	Buy-in from Development Control. Conflict with NPPF conditions test.
4	Clean Air Plans	Promoting Low Emission Transport	Low Emission Zone (LEZ)	Defra/ Doncaster Council (Defra Funded)	August 2017 - December 2019	TBC	TBC	High	Basic cost proposition drawn-up in preparation for available funding opportunities.	Dec-20	Subject to funding and need.
5	Sustainable Travel Access Fund Projects	Promoting Travel Alternatives	Promotion of cycling	SCR (Access Fund)	Pre- April 2017	May 2017 - March 2018	- Dr Bike Services - Cycle Training - Cycle Package	Low	Ongoing	Mar-20	Funding ceases March 2020 and no replacement funds yet identified.
6	Investigate emission standards via taxi licensing	Promoting Low Emission Transport	Taxi Licensing conditions	Doncaster Council - Licensing (Doncaster Council Funded)	July 2017 - July 2018	April 2019	% increase in Euro VI and ULEV licensed taxis	Medium	ECO Stars Taxi Scheme launched and offered to all Barnsley and Doncaster Operators. No uptake in Doncaster.	April 2020	Financial impacts.
7	Future Transport (Fleet) Policy	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission	Doncaster Council - Transport (Doncaster Council Funded)	April 2017 - April 2018	May 2018 - March 2020	% Fleet as Diesel/ Petrol/ ULEV/ Hybrid.	Medium	Investigating funding streams.	Policy in place Summer 2018	Funding availability and availability to appropriate technology.

			vehicles								
8	20mph Speed Limits	Traffic Management	Reduction of speed limits, 20mph zones	Doncaster Council - Safer Roads Team (Doncaster Council Funded)	June 2017	July 2017 - March 2020	Speed Survey Results	Low	20mph speed limits now implemented in west Bessacarr, parts of Town Moor (Manor Drive/Alderson Drive area) and has commenced in north Wheatley. Preparation work on-going for Intake, Thorne (Southfield) and Moorends, and new areas identified as parts of Edlington, Conisbrough and Mexborough.	March 2020	Funding being withdrawn.
9	Co-ordination of road works on key routes	Traffic Management	Other	Douncaster Council - Highways (Doncaster Council Funding)	July 2017 - September 2017	October 2017 - December 2017	Reduction in journey time on key routes	Low	Permit now required for all roads in AQMAs. Tighter controls and conditions can now be implemented on utility companies etc, leading to reduced delays and congestion.	March 2020	Introduction of enhanced coordination software and dissemination of disruption to road user.
10	Cycling Strategy	Promoting Travel Alternatives	Promotion of cycling	Doncaster Council - Transportation (Doncaster Council Funded)	Adopted 2013	2013 - 2020	• numbers of people cycling •number of journeys by bicycle • improve health by increasing cycling as part of everyday life	Low	Strategy currently being updated. Sustrans are developing an implementation to deliver.	March 2020	Funding and uptake
11	Quality Bus Partnership	Promoting Low Emission Transport	Other	Doncaster Council (Bus Operator Funding)	Doncaster Council- Transportation	2016	•Reduce and limit traffic congestion and thereby air through investment in higher Euro Engine	Low	Still in place however no further report.	March 2020	Partnership maintains commitments. Funding. Accessibility and profitability issues.

							specifications • Provide high quality choice for those with use of a car • Reduce environmental impact				
12	Investigate green barriers	Other	Other	Doncaster Council – Environmental Protection	January – December 2018	n/a	n/a	Medium	No progress.	June 2020	Evidence to support impact being available. Funding and resources.
13	Parking Strategy	Policy Guidance and Development Control	Other policy	Doncaster Council - Transportation	2018	Jan-19	4 EV chargers in Council operated car parks. A further 2 planned following redevelopment.	Low	Car parking helath check completed.	June 2020	Parking is currently underutilised therefore plans to consolidate parking under strategy being developed.
14	Walking Strategy	Alternatives to private vehicle use	Other	Doncaster Council - Transportation	2018	Jan-19	TBC	Low	Implementation plan underway. Community Street Audits on target.	June 2020	Two aspects of walking for function and pleasure.
15	Highways Planned Maintenance Scheme Priority	Traffic Management	Other	Doncaster Council - Highways	Early 2018	Summer 2018	No. of works co-ordinated	Low	An air quality site rating score has been introduced as part of our scheme priority modelling process, to date no air quality related sites have been identified for planned highway maintenance works in 2019/20.	June 2020	None.
16	Procurement	Policy Guidance and Development Control	Sustainable Procurement Guidance	Doncaster Council - Procurement	2018	2019	TBC	Medium	None	June 2020	Availability of Procurement Officers.

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.

The Public Health Framework indicator for Doncaster stands at 4.3% which is lower than the national average.

No monitoring data is available locally and no national monitoring is carried out within the Borough. A rolling programme of monitoring is being implemented beginning in June 2019.

PM_{10} data can be used to estimate $PM_{2.5}$ following guidance in TG(16). A national ratio can be used in the absence of a suitable local site; applying this ratio to PM_{10} monitoring in Doncaster produced the following results for $PM_{2.5}$;

Carr House Road, Doncaster – 12.88 µg/m^3.

Low Road, Conisbrough – 15.26µg/m^3.

These concentrations have previously agreed closely with the national modelled figure but the latest modelling is suggesting a reduction that we have not observed with the factored data. As the new monitoring is implemented $PM_{2.5}$ concentrations in Doncaster will continue to be reviewed.

National modelling suggests that concentrations are low across Doncaster. The highest concentration is 8.96µg/m^3 close to the M18 motorway near Armthorpe.

In an attempt to tackle emissions Doncaster Council is taking the following measures to address $PM_{2.5}$:

- Smoke Control Orders are in place across the Borough with complaint led enforcement
- Promotion of ULEV, modal shift and active travel in the AQAP
- Public Health Action Plan (see appendices).

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

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

This section sets out what monitoring has taken place and how it compares with objectives.

Doncaster Council undertook automatic (continuous) monitoring at 6 sites during 2018. Table A.1 in Appendix A shows the details of the sites.

National monitoring results are available at https://uk-air.defra.gov.uk/networks/site-info?site_id=DCST

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

3.1.2 Non-Automatic Monitoring Sites

Doncaster Council undertook non- automatic (passive) monitoring of NO_2 at 69 sites during 2018. 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.

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 (NO_2)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

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_2 hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m^3, not to be exceeded more than 18 times per year.

The data in 2018 indicates an overall improvement in nitrogen dioxide concentrations across the Borough, in some cases these are significant. More than half of monitoring sites show a decrease particularly close to the MRN in AQMA6 but also in AQMA4 and AQMA7 where traffic is influenced by motorway traffic.

There are a small number of incidences of significant increases at some monitoring sites, 2 of which are within AQMAs and therefore no particular action is required. DT57 however has increased above the 40µg/m^3 limit for the first time in 4 years and is not within an AQMA. The site is not one of relevant exposure however and in Appendix B the distance corrected figure is still well below the objective at 29µg/m^3. No further action is required.

Outside of the AQMAs there are no exceedances of the objectives where relevant exposure exists.

AQMA 1, 3 and 4 have for some time seen monitored levels fall below the objective and therefore further short-term studies have been carried out throughout 2018 for 2 of these areas. The data comprises DT60-64 for AQMA 1 and DT65-69 for AQMA3. AQMA4 study will begin in 2019. In AQMA1 it is clear that at many locations with relevant exposure concentrations still exceed. AQMA3 shows a more positive picture however there are still a limited number of sites that remain above the objective. In each case the declarations remain valid.

In conclusion there is no evidence to indicate that any of the AQMAs should be revoked at this time.

The new AQMA at Marr – proposed at this time as AQMA7a – is along the same stretch of road as AQMA7 and is essentially an extension of this AQMA. Marr should have its formal declaration by the end of 2019 and along with AQMA7 reductions in concentrations have been observed however they remain above the objective, as such designation is still required. The proposed boundary can be found in the appendices.

There are 3 non-passive sites that record annual concentrations above 60 µg/m^3 and are therefore likely to lead to an exceedance of the hourly objective, These locations are within AQMA7 which is declared for a breach of both nitrogen dioxide objectives. No further action is required.

A series of graphs have been compiled detailing over 10 years of data across the AQMAs, these graphs can be found as Figures A2 – A10. On the whole results in AQMAs 1, 3, 4, 5 and 6 indicate a downward, albeit slight, trend in nitrogen dioxide concentrations. This downward trend can also be perceived in sites outside of AQMAs and for the annual PM_{10} data.

AQMA2 has a very stable trend with no discernible improvement or reduction in concentrations over the longer term.

AQMA7 while showing a clear decrease of nitrogen dioxide concentrations in 2018, is over the 8 year monitoring period indicating an upward trend.

3.2.2 Particulate Matter (PM_{10})

Table A.5 in Appendix A compares the ratified and adjusted monitored PM_{10} annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3.

Table A.6 in Appendix A compares the ratified continuous monitored PM_{10} daily mean concentrations for the past 5 years with the air quality objective of 50µg/m^3, not to be exceeded more than 35 times per year.

There are no recorded exceedances of PM_{10} across any of the montoring sites in Doncaster and therefore both the annual and daily mean objectives are considered to be met within the Borough.

Figure A.11 shows a clear downward trend in PM_{10} concentrations in Doncaster over the last 10 years.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Inlet Height (m)
CM1	Unit 1 A18 Carr House Road	Roadside	458027	402475	NO2; PM10	Y	Chemiluminescent Analyser; TEOM	4	1.7m	3
CM2	Unit 3 Market Place	Urban centre	457669	403611	NO2; PM10	Y	Chemiluminescent Analyser; TEOM	30.7	20m	3
CM3	Unit 4 A1/A630 Grosvenor Terrace	Roadside	454964	400745	NO2	Y	Chemiluminescent Analyser	15.7	7.3m	3
CM4	Unit 6 A638 Bawtry Road	Roadside	462278	400111	NO2	Y	Chemiluminescent Analyser	20	2.2m	3
CM5	Unit 10 A6023 Low Road, Conisbrough	Roadside	451438	398528	NO2; PM10	Y	Chemiluminescent Analyser; TEOM	17	2.95m	2
CM6	A1, Skellow	Roadside	452185	410380	NO2	Y	Chemiluminescent	11	2.5m	2

Notes:

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DT1	North Bridge (North)	Kerbside	456946	403763	NO2	N	20+	0.8	N	2
DT2	North Bridge (South)	Roadside	457308	403458	NO2	Y	20+	9.2	N	2
DT3	Regent Sq.	Kerbside	457952	403123	NO2	N	1	0.5	N	2
DT4	South Parade	Roadside	457975	403134	NO2	N	20+	2	N	2
DT5	Bennethorpe Road	Kerbside	459113	402842	NO2	Y	20+	0.5	N	2
DT6	Carr House Road	Roadside	459533	402768	NO2	N	20+	6.8	N	2
DT7	Sheep bridge Lane	Kerbside	462899	399328	NO2	N	20+	1	N	2
DT8	Hayfield Lane	Roadside	463023	399428	NO2	N	20+	2.3	N	2
DT9	Hurst Lane	Kerbside	463888	398416	NO2	N	20+	0.8	N	2
DT10	Hayfield Lane/Hurst Lane	Kerbside	464879	399699	NO2	N	20+	0.7	N	2
DT11	Gattison Lane	Roadside	461334	397977	NO2	N	13.3	2.3	N	2
DT12	West End Lane	Roadside	461164	398459	NO2	N	23.8	2	N	2
DT13	Bawtry Road	Roadside	462242	400134	NO2	Y	20+	3.5	N	2
DT14	Stoops Lane	Roadside	461362	400777	NO2	N	14	3.2	N	2
DT15	Dunniwood Avenue	Roadside	461875	400396	NO2	N	9.5	1.5	N	2

DT16	Burnham Close	Roadside	460703	400559	NO2	N	10.8	1.2	N	2
DT17	Lindrick Close	Roadside	459947	401538	NO2	N	7.5	3	N	2
DT18	Cantley Lane	Roadside	460342	402108	NO2	N	12.5	1.2	N	2
DT19	Gliwice Way (Dome)	Roadside	459745	402638	NO2	N	20+	3.3	N	2
DT20	Gliwice Way (Town)	Roadside	459721	402650	NO2	N	20+	2.3	N	2
DT21	Hall Flat Junction	Roadside	456164	401227	NO2	Y	6	1.5	N	2
DT22	Warde Avenue	Roadside	455679	401000	NO2	Y	10.7	2.5	N	2
DT23	Low Road	Kerbside	451457	398659	NO2	N	1.2	1	N	2
DT24	Clifton Hill Junction	Roadside	451419	398540	NO2	N	2.7	2.2	N	2
DT25	Waverley Avenue	Roadside	455635	401002	NO2	Y	20+	1.5	N	2
DT26	High Road	Roadside	456130	401258	NO2	Y	20+	2.5	N	2
DT27	Belmont Avenue	Roadside	457010	402056	NO2	Y	1	1.5	N	2
DT28	Mansfield Road	Roadside	457022	402141	NO2	Y	0.3	3.7	N	2
DT29	Airport – Hayfield Lane	Roadside	464986	399697	NO2	N	0	8.7	N	2
DT30	Airport – Gate House Lane	Roadside	465719	400140	NO2	N	9.3	6	N	2
DT31	Airport – Mosham Road	Roadside	466895	400405	NO2	N	0	11.3	N	2
DT32	Airport – Rose Cottage	Roadside	467174	400372	NO2	N	0	5.5	N	2

DT33	Airport – Hatfield Moors	Background	468629	404336	NO2	N	20+	N/A	N	2
DT34	Airport – Hatfield Woodhouse	Roadside	467755	408643	NO2	N	20+	2.3	N	2
DT35	Airport - Hollinbridge Lane	Background	469056	407623	NO2	N	20+	N/A	N	2
DT36	Market Place	Roadside	457615	403630	NO2	Y	20+	6.3	N	2
DT37	Church Way	Roadside	457379	403460	NO2	Y	4	4	N	2
DT38	Stainforth	Urban background	464046	411818	NO2	N	20+	9.3	N	2
DT39	Howden Avenue, Skellow	Roadside	452219	410224	NO2	N	0	7	N	2
DT40	Hill Crest, Skellow	Kerbside	452195	410302	NO2	N	0.3	7.6	N	2
DT41	Five Lane Ends, A1, Skellow	Roadside	452180	410377	NO2	N	6.65	9.35	N	2
DT42	Skellow – Crabgate Lane	Roadside	452180	410402	NO2	N	15	1	N	2
DT43	Skellow – Hampole Balk	Roadside	452192	410389	NO2	N	12	1.8	N	2
DT44	Hickleton – Sue Ryder Care Home	Kerbside	448221	405303	NO2	N	3	1	N	2
DT45	Hickleton – Doncaster Road	Roadside	447966	405303	NO2	N	0	14.4	N	2
DT46	Hickleton – Barnsley Road	Roadside	448149	405296	NO2	N	0	3.6	N	2

DT47	Hickleton – Opp. Fir Tree Close	Kerbside	448054	405319	NO2	N	0.3	0.8	N	2
DT48	Hickleton – John O'Gaunts	Kerbside	448218	405320	NO2	N	0.3	0.8	N	2
DT49	Marr	Kerbside	451331	405219	NO2	N	0	3.1	N	2
DT50	Thorne – King Street	Roadside	468749	413300	NO2	N	0.5	2	N	2
DT51	Willow Street, Conisbrough	Roadside	451446	398582	NO2	Y	20+	2.1	N	2
DT52	Doncaster Road (Junction), Conisbrough	Roadside	451485	398514	NO2	Y	2	2	N	2
DT53	27 Low Road, Conisbrough	Kerbside	451453	398632	NO2	Y	0	1.88	N	2
DT54	32/34 Low Road, Conisbrough	Roadside	451440	398652	NO2	Y	0.3	1.78	N	2
DT55	Doncaster Road, Conisbrough	Roadside	451624	398690	NO2	Y	0	6	N	2
DT56	Mason Arms, Mexborough	Roadside	448047	399880	NO2	N	3	4	N	2
DT57	Doncaster Road, Mexbrough	Roadside	448004	399862	NO2	N	13	2	NO	2
DT58	Barnsley Road, Marr	Kerbside	451824	405228	NO2	NO	0.3	1	NO	2
DT59	Bus Stop, Marr	Roadside	451514	405247	NO2	NO	0	18	NO	2
DT60	St Leger Place	Roadside	457870	403839	NO2	YES	0.5	7	NO	2

DT61	Dockin Hill Road	Roadside	457791	403767	NO2	YES	0.5	15.5	NO	2
DT62	Church Way	Roadside	457733	403740	NO2	YES	0.5	7	NO	2
DT63	Market Road	Roadside	457701	403579	NO2	YES	0	1.7	NO	2
DT64	The Swan	Roadside	457345	403433	NO2	YES	0	13.4	NO	2
DT65	Somerset Road	Roadside	457995	402506	NO2	YES	3.7	8	NO	2
DT66	Carr House 1	Roadside	458142	402563	NO2	YES	0	5.8	NO	2
DT67	Carr House 2	Roadside	458259	402582	NO2	YES	0	6.3	NO	2
DT68	Carr House 3	Roadside	458923	402567	NO2	YES	0	4.7	NO	2
DT69	White Road Rdbt	Roadside	457932	402448	NO2	YES	0	12.9	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.

Table A.3 – Annual Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 Annual Mean Concentration ($\mu g/m^3$) (3)				
					2014	2015	2016	2017	2018
CM1	Roadside	Automatic		n/a	**n/a**	**n/a**	**20**	**28.6**	**n/a**
CM2	Urban Background	Automatic		92	**n/a**	**n/a**	**46.8**	**26.1**	**25.6**
CM3	Roadside	Automatic		n/a	**n/a**	**n/a**	**43.1**	**23.9**	**n/a**
CM4	Roadside	Automatic		94	**n/a**	**n/a**	**n/a**	**37.2**	**28.1**
CM5	Roadside	Automatic		90	**n/a**	**31.2 (6 months)**	**31.6**	**37**	**30.5**
CM6	Roadside	Automatic		97	**43.2**	**39.6**	**39.2**	**45.8**	**37.3**
DT1	Kerbside	Diffusion Tube		67	**36**	**32**	**33**	**33**	**32**
DT2	Roadside	Diffusion Tube		100	**42**	**36**	**40**	**41**	**41**
DT3	Kerbside	Diffusion Tube		100	**32**	**27**	**33**	**33**	**31**
DT4	Roadside	Diffusion Tube		100	**44**	**39**	**40**	**45**	**39**
DT5	Kerbside	Diffusion Tube		83	**44**	**36**	**39**	**43**	**37**
DT6	Roadside	Diffusion Tube		83	**34**	**29**	**30**	**35**	**30**
DT7	Kerbside	Diffusion Tube			**34**	**27**	**35**	**43**	**no data**
DT8	Roadside	Diffusion Tube		100	**30**	**24**	**28**	**26**	**26**
DT9	Kerbside	Diffusion Tube		100	**27**	**25**	**33**	**37**	**27**
DT10	Kerbside	Diffusion Tube		92	**24**	**19**	**23**	**25**	**22**

DT11	Roadside	Diffusion Tube		67	**24**	**20**	**25**	**24**	**24**
DT12	Roadside	Diffusion Tube		100	**24**	**21**	**27**	**28**	**27**
DT13	Roadside	Diffusion Tube		100	**48**	**39**	**43**	**44**	**41**
DT14	Roadside	Diffusion Tube		100	**44**	**38**	**41**	**44**	**37**
DT15	Roadside	Diffusion Tube			**25**	**20**	**23**	**Ceased**	**Ceased**
DT16	Roadside	Diffusion Tube			**25**	**20**	**24**	**Ceased**	**Ceased**
DT17	Roadside	Diffusion Tube			**21**	**21**	**23**	**Ceased**	**Ceased**
DT18	Roadside	Diffusion Tube			**29**	**22**	**26**	**Ceased**	**Ceased**
DT19	Roadside	Diffusion Tube			**46**	**39**	**41**	**Ceased**	**Ceased**
DT20	Roadside	Diffusion Tube			**44**	**35**	**40**	**Ceased**	**Ceased**
DT21	Roadside	Diffusion Tube		100	**48**	**42**	**47**	**50**	**50**
DT22	Roadside	Diffusion Tube		100	**53**	**43**	**48**	**50**	**52**
DT23	Kerbside	Diffusion Tube		100	**42**	**35**	**37**	**41**	**40**
DT24	Roadside	Diffusion Tube		100	**43**	**34**	**40**	**41**	**43**
DT25	Roadside	Diffusion Tube		100	**41**	**32**	**38**	**41**	**41**
DT26	Roadside	Diffusion Tube		92	**38**	**32**	**35**	**38**	**39**
DT27	Roadside	Diffusion Tube		100	**41**	**35**	**44**	**48**	**45**
DT28	Roadside	Diffusion Tube		100	**54**	**43**	**52**	**52**	**57**

DT29	Roadside	Diffusion Tube		83	**17**	**14**	**17**	**19**	**16**
DT30	Roadside	Diffusion Tube		92	**19**	**15**	**18**	**18**	**19**
DT31	Roadside	Diffusion Tube		100	**18**	**14**	**17**	**17**	**16**
DT32	Roadside	Diffusion Tube		100	**20**	**16**	**20**	**18**	**19**
DT33	Background	Diffusion Tube		92	**13**	**9**	**10**	**12**	**11**
DT34	Roadside	Diffusion Tube		100	**24**	**19**	**22**	**23**	**21**
DT35	Background	Diffusion Tube		92	**13**	**10**	**12**	**12**	**13**
DT36	Roadside	Diffusion Tube		100	**41**	**32**	**38**	**41**	**37**
DT37	Roadside	Diffusion Tube		100	**46**	**34**	**41**	**41**	**41**
DT38	Urban background	Diffusion Tube		100	**20**	**15**	**18**	**18**	**19**
DT39	Roadside	Diffusion Tube		100	**35**	**38**	**45**	**47**	**41**
DT40	Kerbside	Diffusion Tube		100	**51**	**40**	**48**	**48**	**45**
DT41	Roadside	Diffusion Tube		100	**54**	**46**	**53**	**55**	**48**
DT42	Roadside	Diffusion Tube		100	**48**	**38**	**43**	**46**	**43**
DT43	Roadside	Diffusion Tube		100	**45**	**36**	**42**	**43**	**40**
DT44	Kerbside	Diffusion Tube		100	**79**	**66**	**78**	**79**	**70**
DT45	Roadside	Diffusion Tube		100	**25**	**18**	**23**	**25**	**25**
DT46	Roadside	Diffusion Tube		100	**43**	**32**	**41**	**37**	**40**

DT47	Kerbside	Diffusion Tube		100	**95**	**87**	**106**	**100**	**91**
DT48	Kerbside	Diffusion Tube		100	**94**	**80**	**93**	**90**	**87**
DT49	Kerbside	Diffusion Tube		100	**40**	**34**	**44**	**46**	**43**
DT50	Roadside	Diffusion Tube		100	**41**	**33**	**41**	**40**	**41**
DT51	Roadside	Diffusion Tube		100	**36**	**29**	**32**	**34**	**35**
DT52	Roadside	Diffusion Tube		100	**50**	**37**	**42**	**43**	**44**
DT53	Kerbside	Diffusion Tube		100	**46**	**34**	**42**	**42**	**43**
DT54	Roadside	Diffusion Tube		100	**53**	**40**	**46**	**48**	**47**
DT55	Roadside	Diffusion Tube		100	**34**	**27**	**31**	**36**	**34**
DT56	Roadside	Diffusion Tube		100	**41**	**32**	**37**	**40**	**41**
DT57	Roadside	Diffusion Tube		100	**43**	**33**	**38**	**38**	**45**
DT58	Kerbside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**46**	**43**
DT59	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**22**	**23**
DT60	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**43**
DT61	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**42**
DT62	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**53**
DT63	Kerbside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**50**
DT64	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**49**

DT65	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**39**
DT66	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**43**
DT67	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**38**
DT68	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**29**
DT69	Roadside	Diffusion Tube		100	**n/a**	**n/a**	**n/a**	**n/a**	**37**

☒ **Diffusion tube data has been bias corrected**

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

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 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.

Figure A.2 – Trends in Annual Mean NO_2 Concentrations – AQMA1

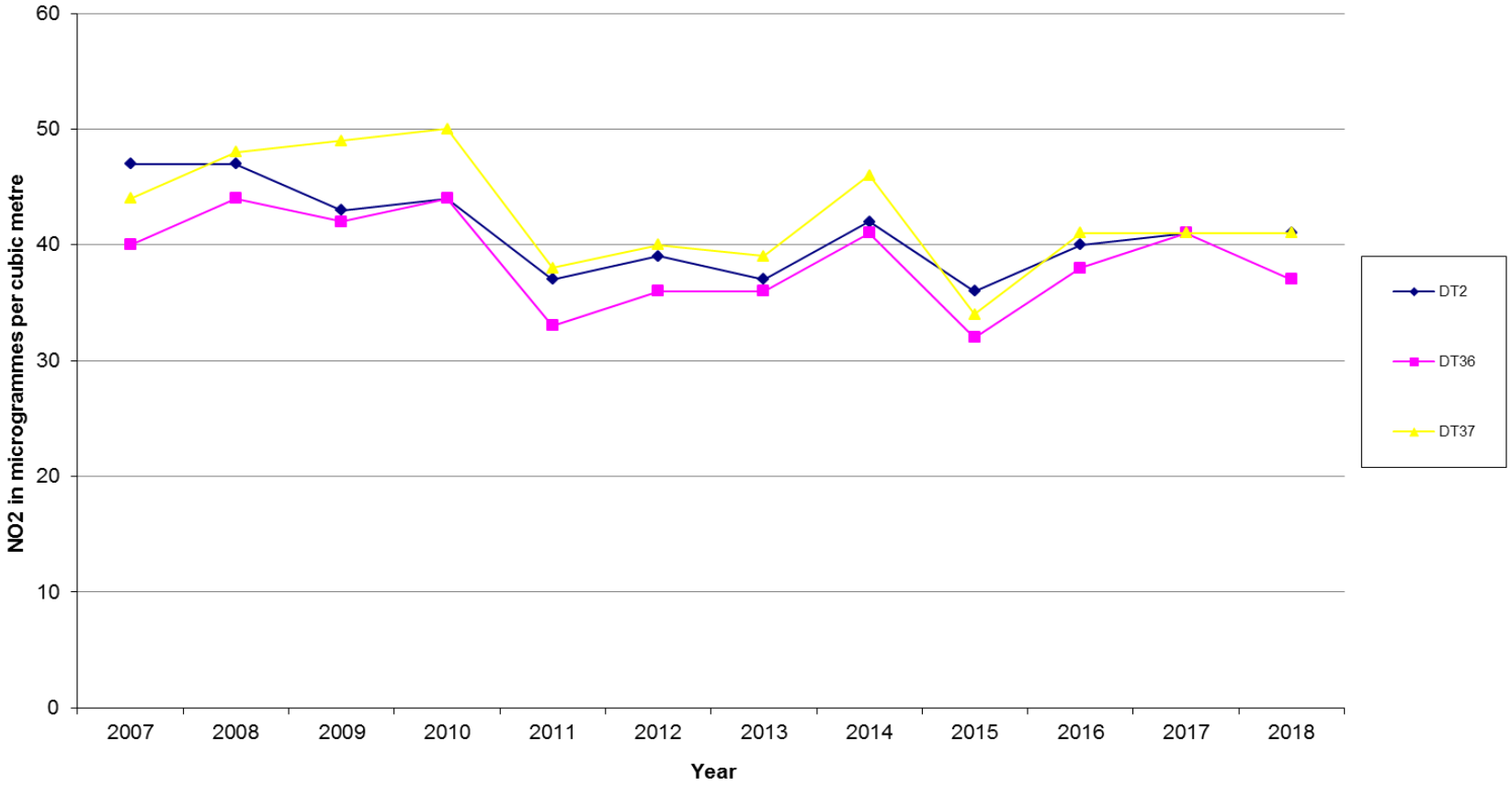


Figure A.3 – Trends in Annual Mean NO_2 Concentrations – AQMA2

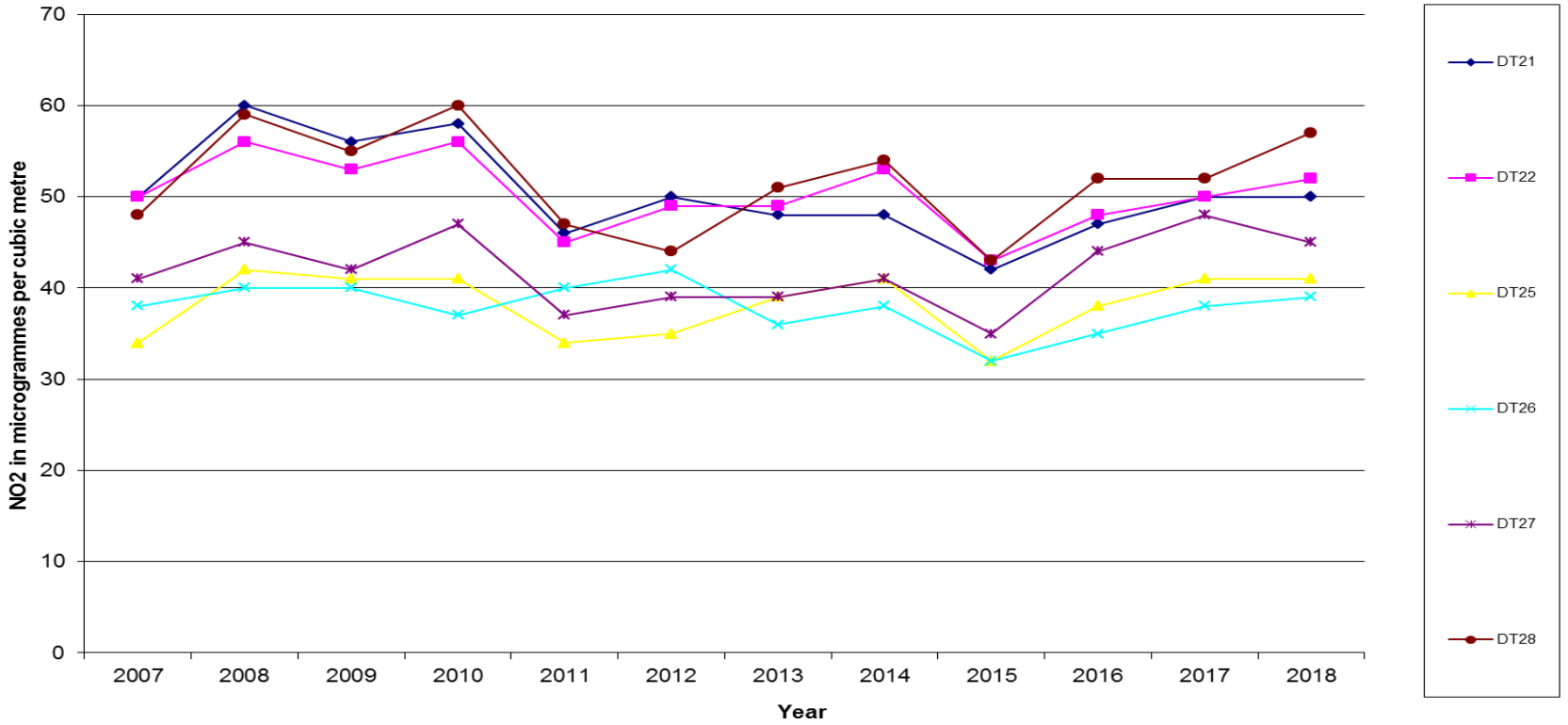


Figure A.4 – Trends in Annual Mean NO_2 Concentrations – AQMA3

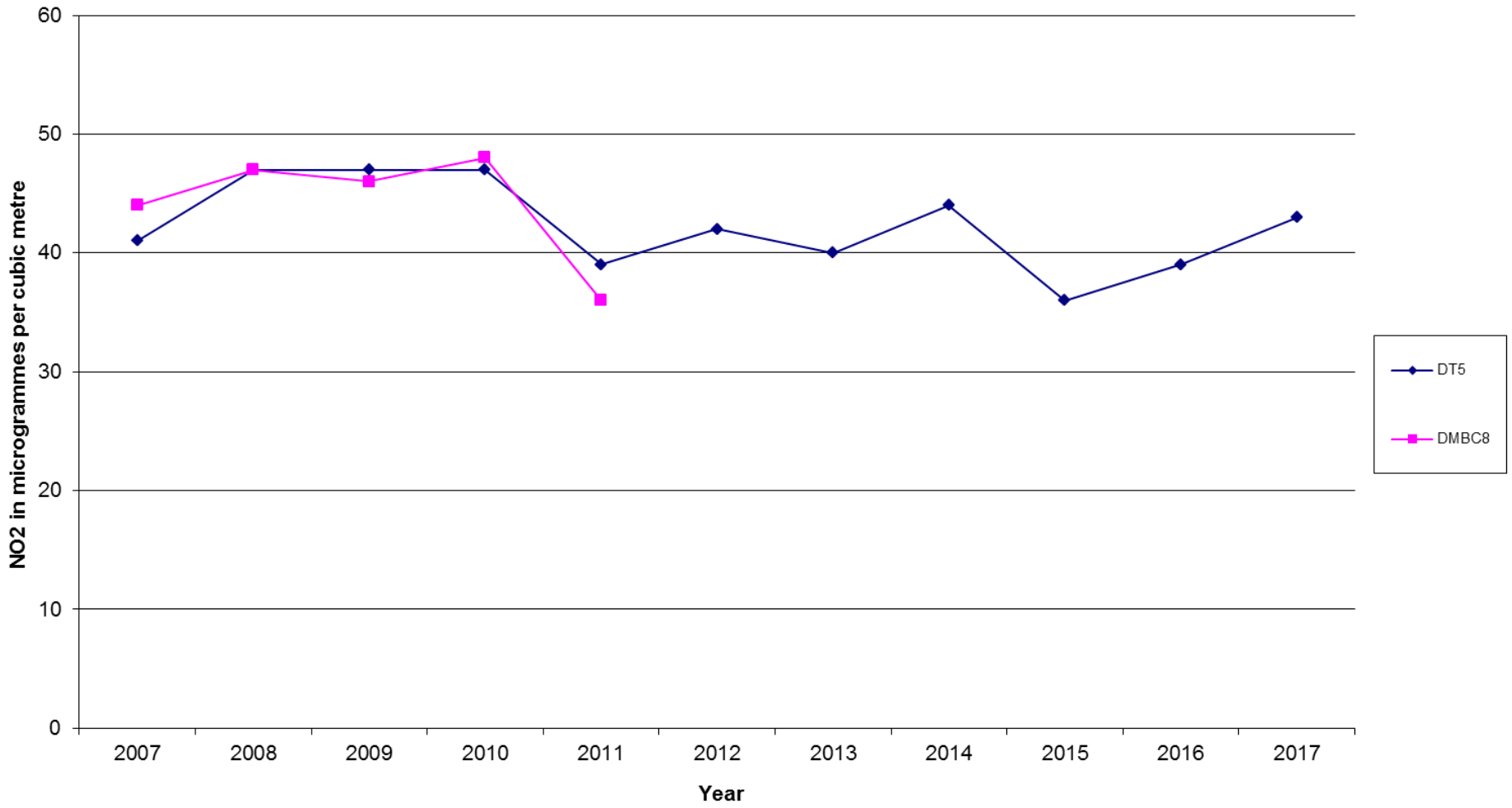


Figure A.5 – Trends in Annual Mean NO2 Concentrations – AQMA4

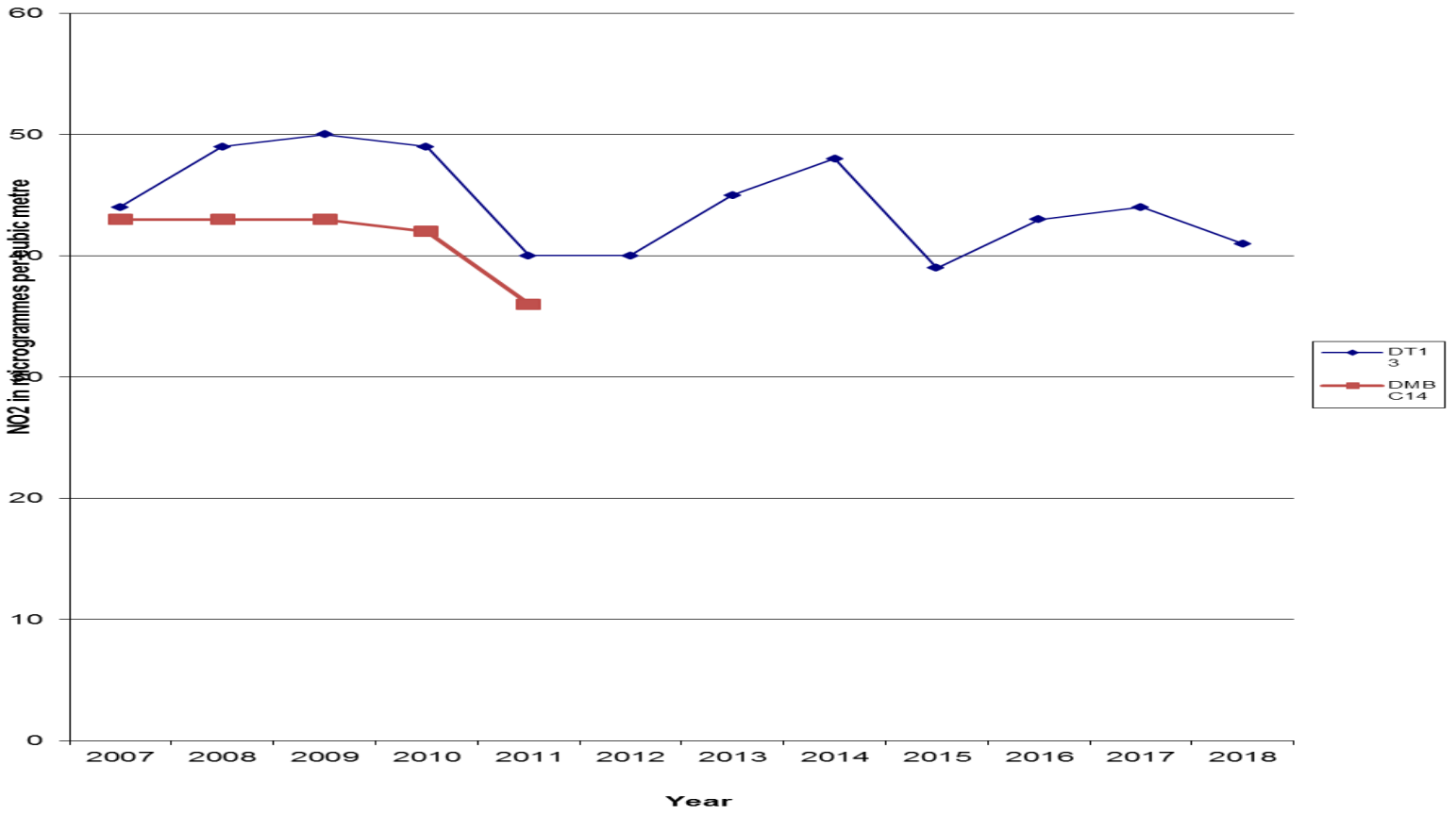


Figure A.6 – Trends in Annual Mean NO2 Concentrations – AQMA5

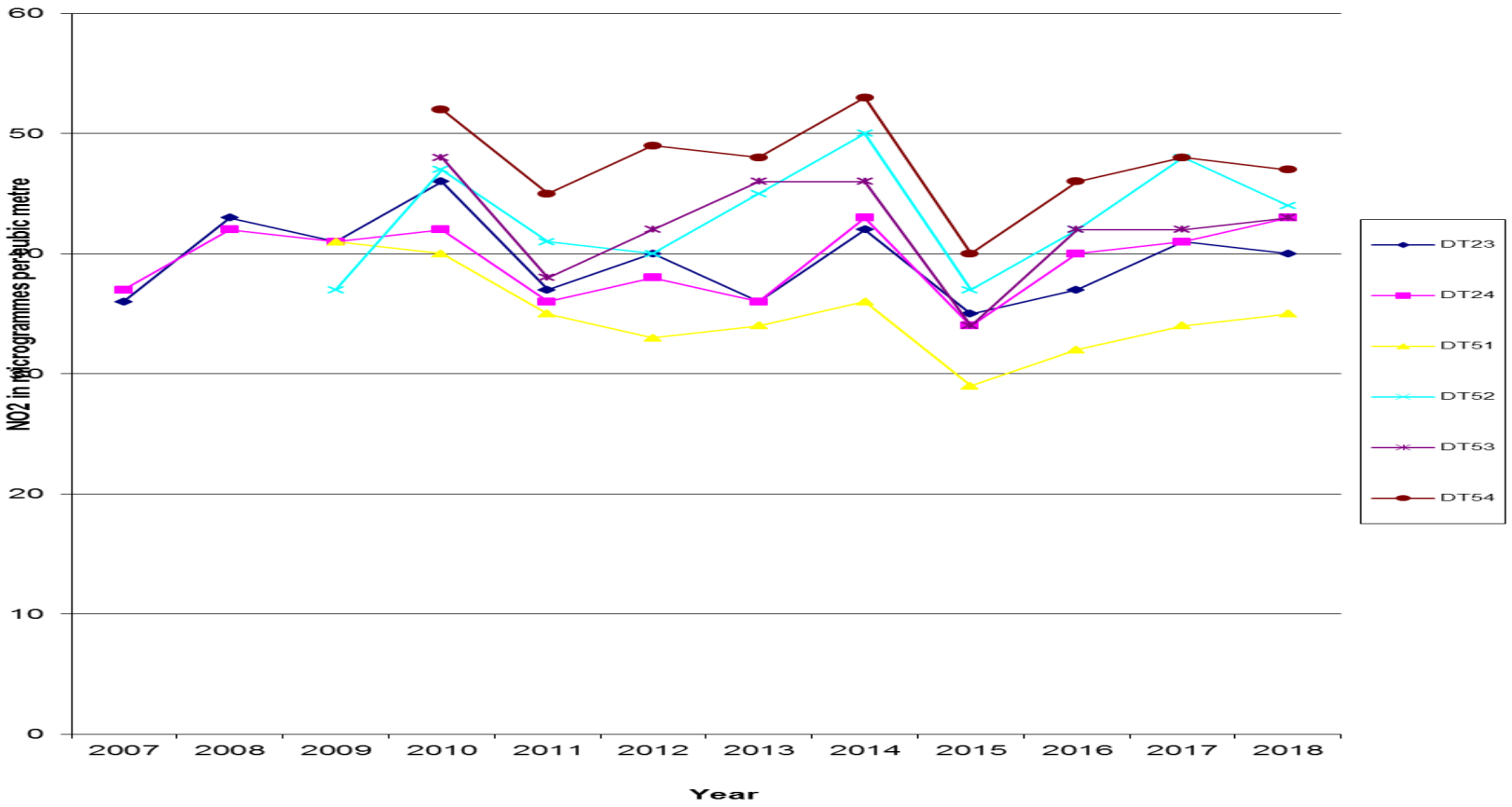


Figure A.7 – Trends in Annual Mean NO2 Concentrations – AQMA6

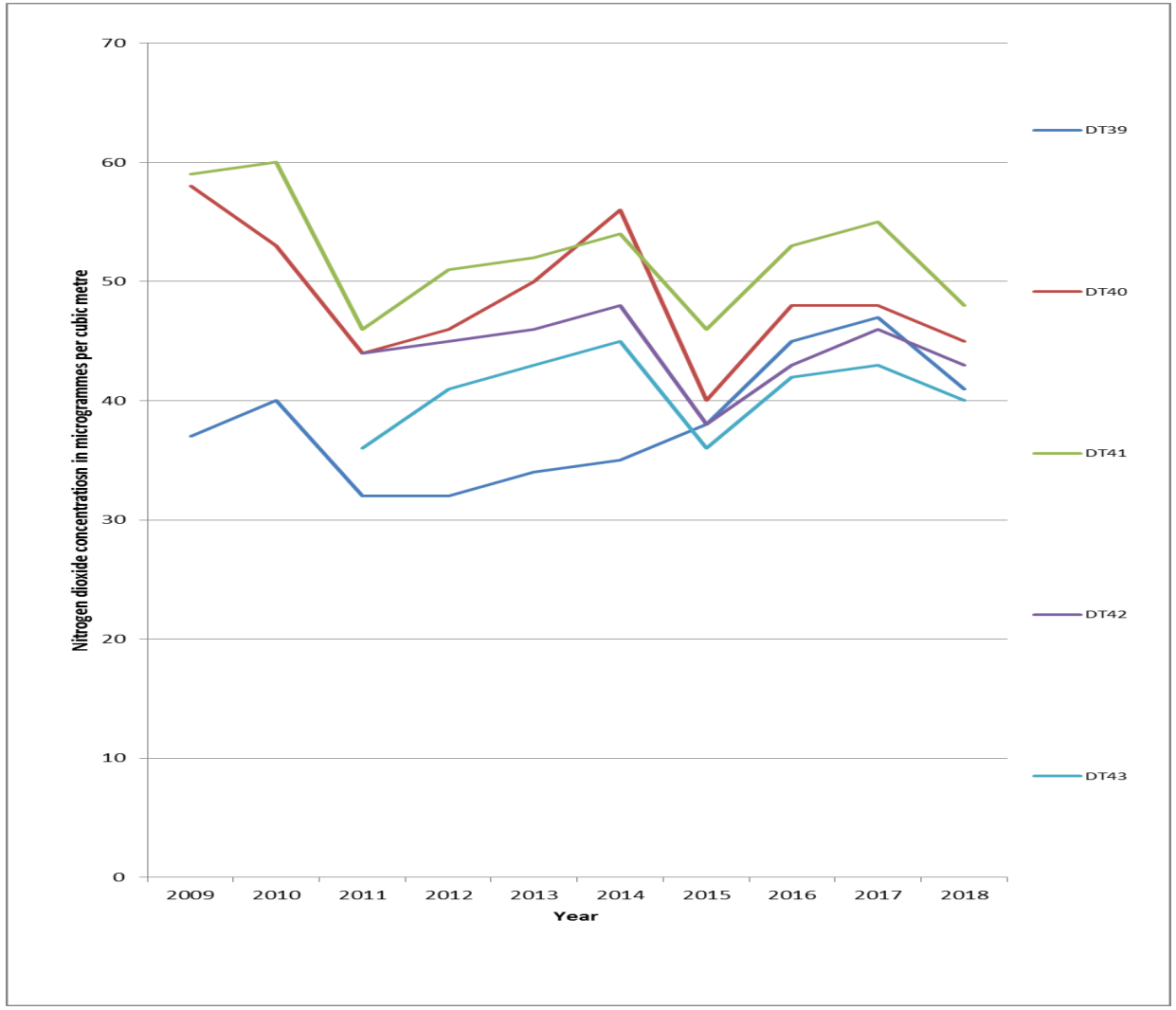


Figure A.8 – Trends in Annual Mean NO2 Concentrations – AQMA7

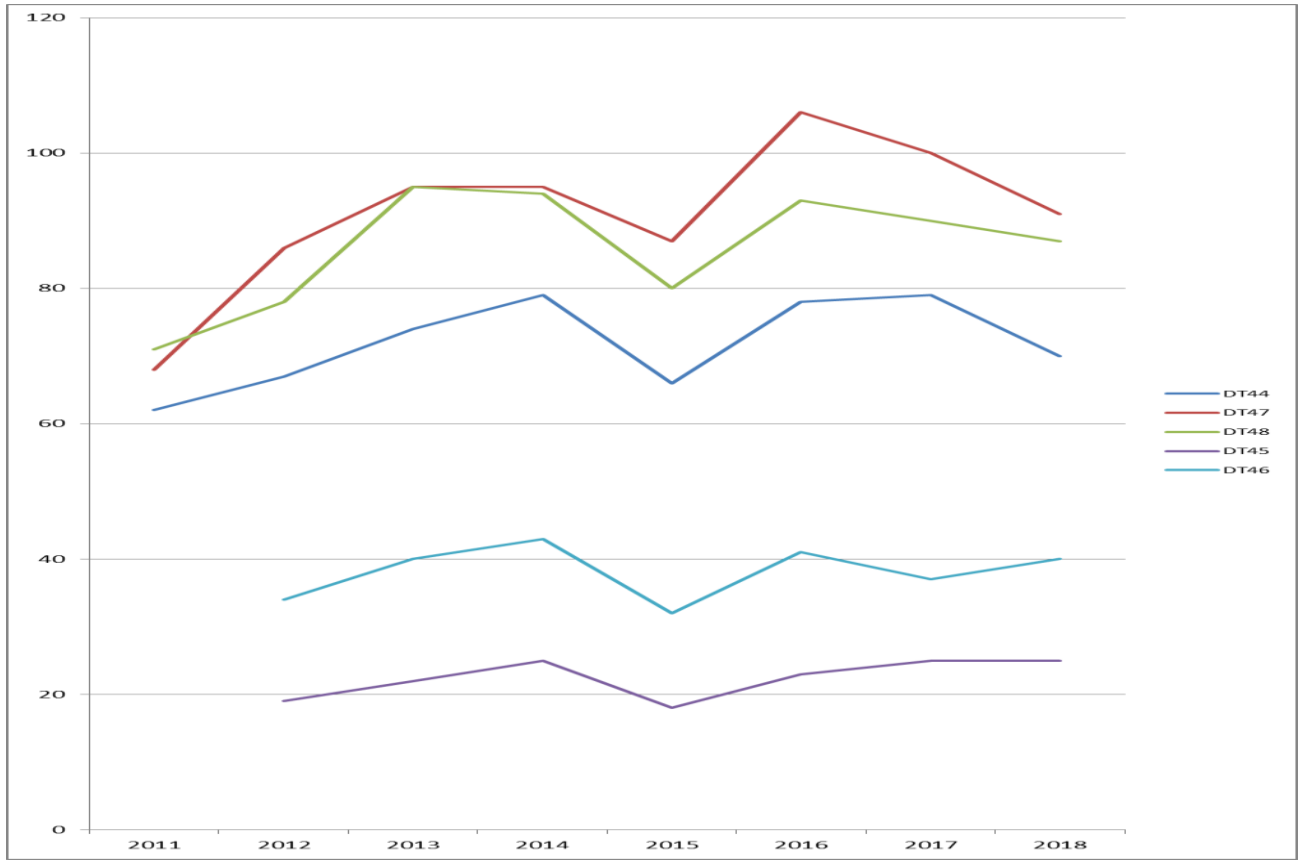


Figure A.9 – Trends in Annual Mean NO2 Concentrations – Automatic Data

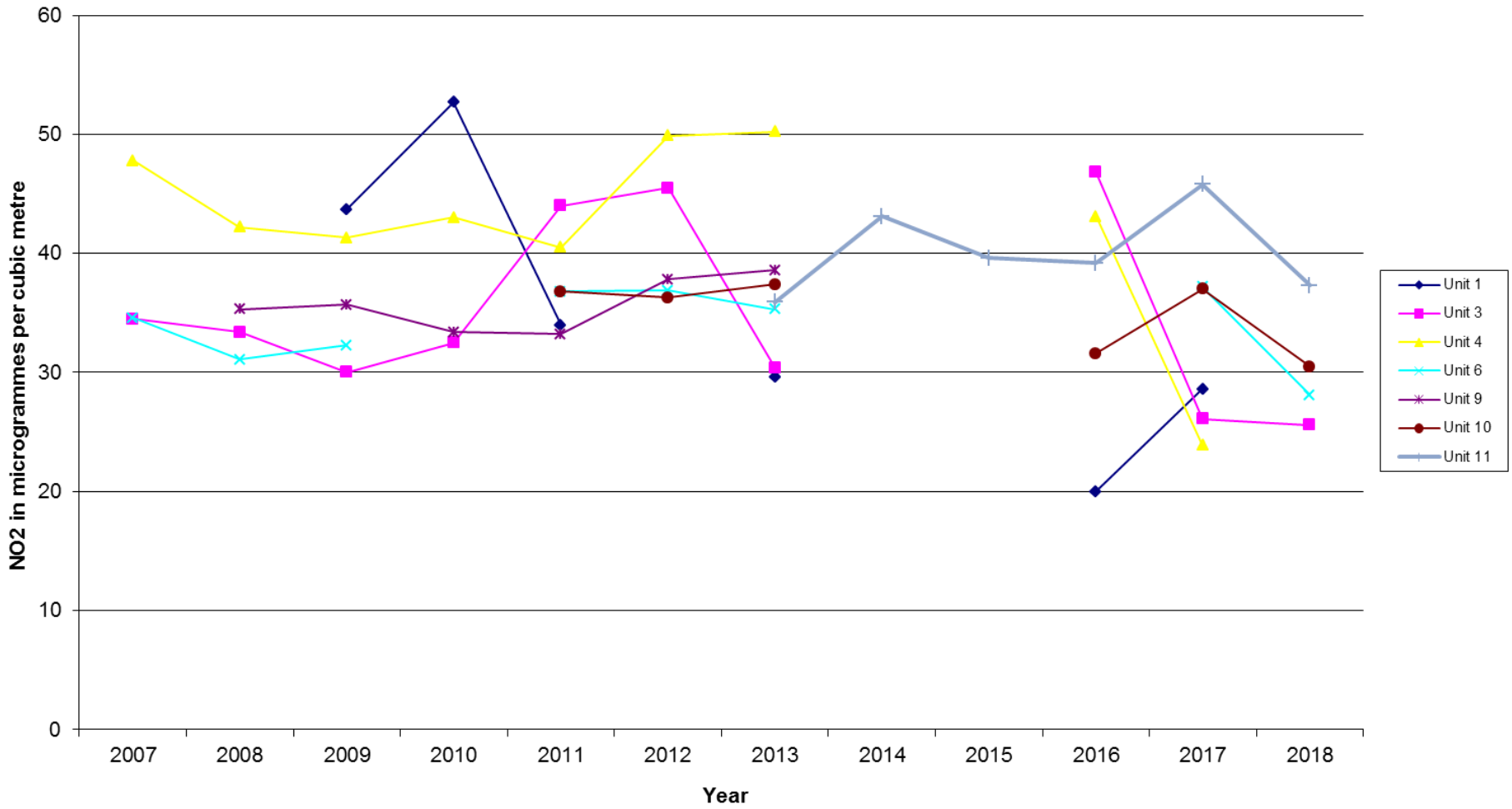


Figure A.10 – Trends in Annual Mean NO2 Concentrations – Non-AQMA

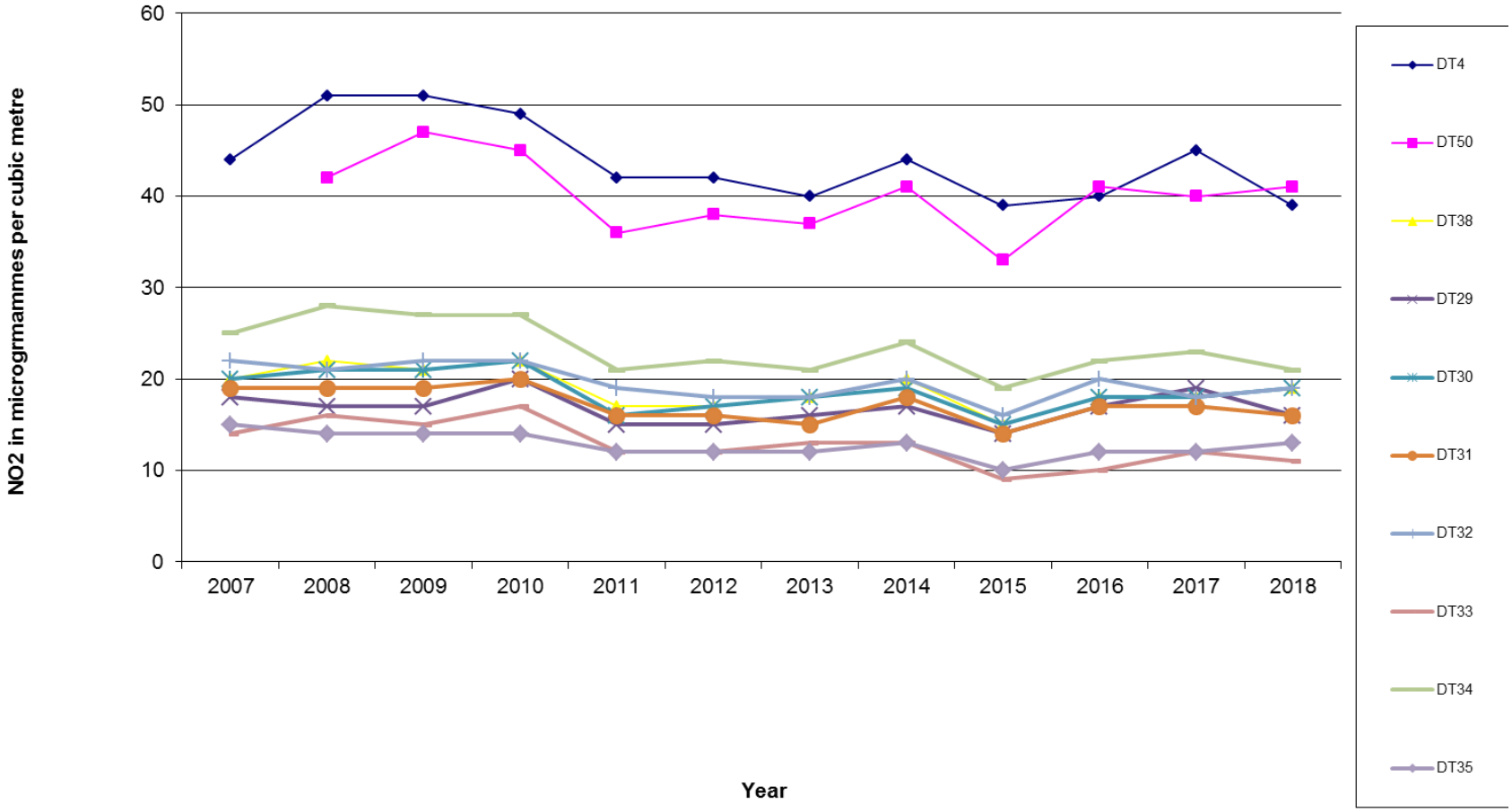


Table A.4 – 1-Hour Mean NO_2 Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	NO_2 1-Hour Means > 200µg/m^3 (3)				
					2014	2015	2016	2017	2018
CM1	Roadside	Automatic	n/a	n/a	**No data**	**0(184.5)**	**0(45.5)**	**0 (93.6)**	**n/a**
CM2	Urban Centre	Automatic	92	92	**No data**	**n/a**	**0(126.6)**	**0**	**0**
CM3	Roadside	Automatic	n/a	n/a	**No data**	**n/a**	**3 (153.09)**	**0**	**n/a**
CM4	Roadside	Automatic	94	94	**No data**	**n/a**	**0(21.5)**	**0 (114.4)**	**0**
CM5	Roadside	Automatic	90	90	**No Data**	**0(101.0)**	**0(62.1)**	**0 (115.6)**	**0**
CM6	Roadside	Automatic	97	97	**0**	**0**	**0 (61.3)**	**6**	**0**

Notes:

Exceedances of the NO_2 1-hour mean objective (200µg/m^3 not to be exceeded more than 18 times/year) are shown in **bold.**

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

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

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

Table A.5 – Annual Mean PM_{10} Concentrations

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} Annual Mean Concentration ($\mu g/m^3$) (3)				
				2014	2015	2016	2017	2018
CM1	Roadside	89	89	**No data**	**15.5 (5 months)**	**17.7**	17.4	18.4
CM2	Urban Centre	97	97	**No data**	**No data**	18.5	17.7	16.7
CM5	Roadside	90	90	**No data**	**18.7 (6 months)**	19	18.8	21.8

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

Notes:

Exceedances of the PM_{10} annual mean objective of 40$\mu g/m^3$ are shown in **bold.**

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

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

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

Figure A.11 – Trends in Annual Mean PM_{10} Concentrations

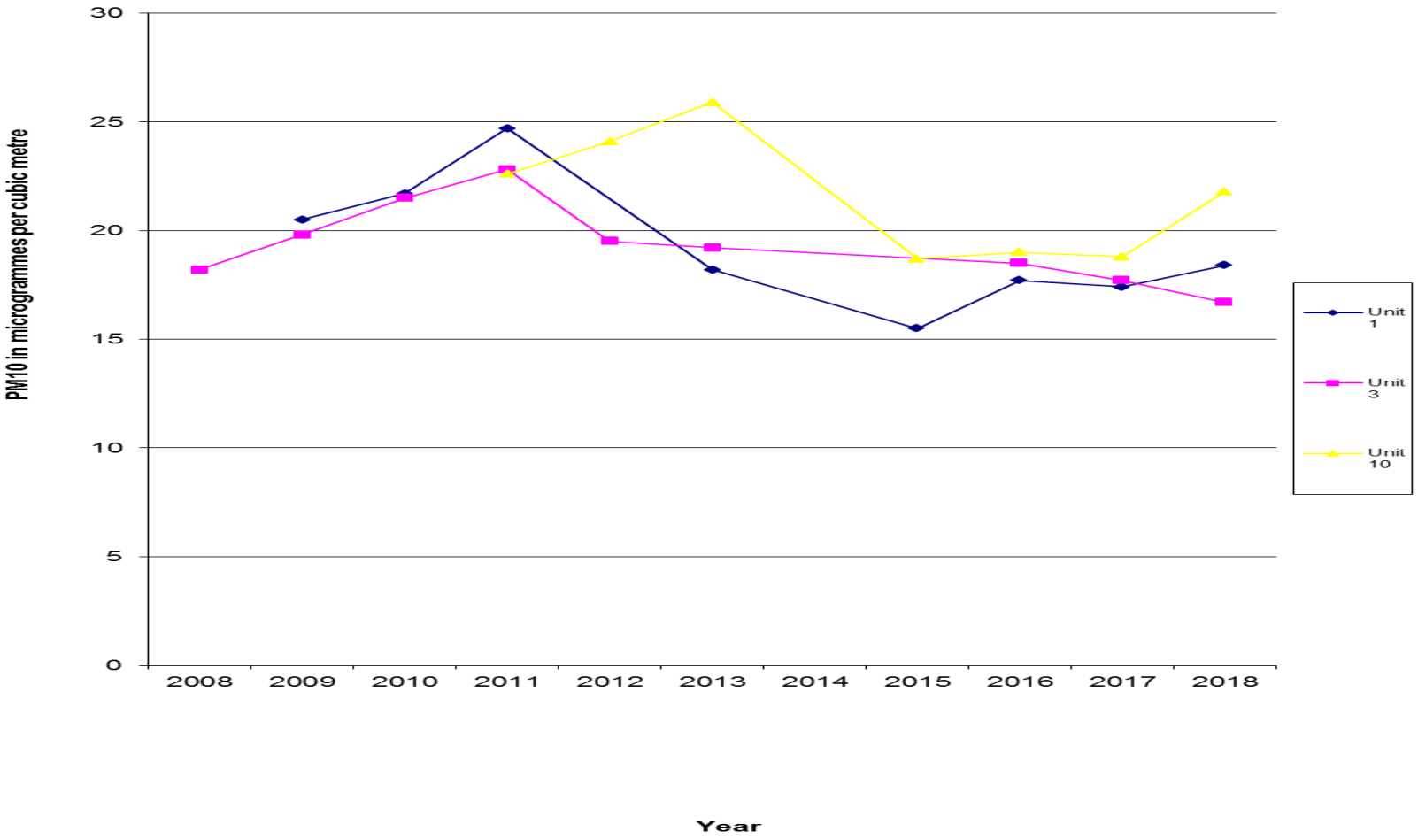


Table A.6 – 24-Hour Mean PM_{10} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2018 (%) (2)	PM_{10} 24-Hour Means > 50µg/m^3 (3)				
				2014	2015	2016	2017	2018
CM1	Roadside	89	89	**No data**	0	**0 (27.3)**	3	2
CM2	Urban Centre	97	97	**No data**	**No data**	**0 (32.4)**	4	2
CM5	Roadside	90	90	**No data**	**1 (28)**	3	4	3

Notes:

Exceedances of the PM_{10} 24-hour mean objective (50µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold.**

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2018

Table B.1 – NO_2 Monthly Diffusion Tube Results - 2018

Site ID	NO_2 Mean Concentrations ($\mu g/m^3$)														
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean		
													Raw Data	Bias Adjusted (1.1) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DT1	32	32	35	35	NR	NR	NR	21	17	34	NR	38	31.0	34.0	19.0
DT2	49	38	43	48	30	24	32	28	28	45	48	37	38.0	**41.0**	28.0
DT3	33	35	31	32	20	19	22	23	21	35	33	33	28.0	31.0	27.0
DT4	42	36	39	38	27	31	35	35	28	34	41	40	36.0	39.0	23.0
DT5	36	38	39	33	31	27	33	25	25	NR	NR	48	34.0	37.0	20.0
DT6	34	33	30	29	22	17	24	NR	24	NR	30	33	28.0	30.0	21.0
DT7	NR	NR	NR	NR	NR	NR	NR	NR	NR	13	33	37	28.0	30.0	18.0
DT8	26	28	26	23	23	20	20	18	14	24	30	30	24.0	26.0	18.0
DT9	33	28	30	25	27	20	20	23	19	24	23	27	25.0	27.0	17.0
DT10	24	23	27	17	17	18	18	19	16	20	23	NR	20.0	22.0	15.0
DT11	27	28	23	17	19	NR	NR	14	NR	NR	25	32	23.0	25.0	18.0
DT12	31	30	25	22	23	16	25	23	18	21	30	27	24.0	27.0	17.0
DT13	43	39	40	38	37	27	38	35	27	35	41	45	37.0	**41.0**	26.0
DT14	41	33	37	36	31	22	30	34	26	33	42	44	34.0	37.0	26.0
DT15															

DT16															
DT17															
DT18															
DT19															
DT20															
DT21	50	50	49	40	44	37	44	45	32	43	51	60	45.0	**50.0**	36.0
DT22	58	49	50	44	47	40	47	41	34	43	45	65	47.0	**52.0**	35.0
DT23	43	39	39	35	39	33	35	33	27	29	40	48	37.0	**40.0**	35.0
DT24	42	40	37	39	40	34	41	35	35	36	38	47	39.0	**43.0**	37.0
DT25	35	39	41	40	37	29	38	31	26	37	41	51	37.0	**41.0**	24.0
DT26	42	39	37	36	32	25	29	33	29	NR	43	49	36.0	39.0	24.0
DT27	53	43	44	43	40	36	41	38	25	40	39	54	41.0	**45.0**	**41.0**
DT28	52	53	50	55	64	46	53	47	37	49	49	62	51.0	**57.0**	**56.0**
DT29	23	NR	17	8	10	9	10	14	15	NR	15	22	14.0	16.0	14.0
DT30	21	18	21	15	11	NR	14	14	14	17	25	24	18.0	19.0	17.0
DT31	20	16	17	13	9	7	12	14	15	17	18	20	15.0	16.0	16.0
DT32	22	18	18	15	12	11	16	16	17	19	18	22	17.0	19.0	19.0
DT33	14	NR	11	6	5	6	7	8	9	10	18	15	10.0	11.0	
DT34	27	21	22	18	11	14	14	16	19	20	24	24	19.0	21.0	34.0
DT35	15	NR	12	7	7	5	7	9	9	28	14	16	12.0	13.0	
DT36	41	37	35	34	27	32	29	27	33	36	35	42	34.0	37.0	25.0
DT37	44	37	37	38	31	28	37	32	36	39	42	42	37.0	**41.0**	35.0
DT38	21	21	19	14	13	10	12	14	17	19	22	22	17.0	19.0	16.0
DT39	42	39	30	32	26	28	37	44	43	45	37	42	37.0	**41.0**	**41.0**
DT40	44	43	38	37	35	30	39	45	40	47	44	45	41.0	**45.0**	**45.0**
DT41	53	47	43	44	35	28	41	51	50	48	42	45	44.0	**48.0**	**41.0**

DT42	50	44	42	34	30	24	35	43	39	43	39	45	39.0	**43.0**	25.0
DT43	47	42	38	32	25	29	36	36	29	41	35	42	36.0	**40.0**	27.0
DT44	71	69	65	54	49	51	61	74	63	72	62	71	64.0	**70.0**	**54.0**
DT45	32	28	26	20	14	15	32	18	11	24	31	26	23.0	25.0	25.0
DT46	37	43	50	36	34	36	34	28	30	30	41	36	36.0	**40.0**	**40.0**
DT47	74	92	86	67	91	73	89	79	80	83	93	83	83.0	**91.0**	**86.0**
DT48	95	81	75	71	71	76	80	75	75	83	85	78	79.0	**87.0**	**82.0**
DT49	45	45	43	37	29	30	36	40	41	42	39	47	40.0	**43.0**	**43.0**
DT50	47	41	41	33	26	27	33	36	33	37	46	49	37.0	**41.0**	39.0
DT51	41	39	34	34	22	18	28	24	30	33	38	40	32.0	35.0	22.0
DT52	44	46	47	37	42	35	41	34	31	37	38	45	40.0	**44.0**	39.0
DT53	44	47	44	39	33	32	39	33	32	41	44	43	39.0	**43.0**	**43.0**
DT54	58	50	49	41	35	29	36	40	39	43	49	45	43.0	**47.0**	**46.0**
DT55	46	34	33	29	18	16	26	31	32	33	36	38	31.0	34.0	34.0
DT56	50	45	41	31	31	23	31	35	36	38	40	46	37.0	**41.0**	36.0
DT57	44	53	51	38	34	28	39	39	35	39	43	48	41.0	**45.0**	29.0
DT58	49	44	45	38	34	33	39	29	37	41	42	42	39.0	**43.0**	**41.0**
DT59	27	22	25	22	14	12	16	17	20	22	23	26	21.0	23.0	23.0
DT60	44	45	43	39	32	29	36	37	38	44	41	46	40.0	**43.0**	**42.7**
DT61	48	41	42	36	26	26	33	40	39	43	37	47	38.0	**42.0**	**41.5**
DT62	66	52	49	49	35	41	44	48	47	51	45	52	48.0	**53.0**	**52.1**
DT63	49	55	53	44	34	37	45	30	38	50	55	52	45.0	**50.0**	**49.7**
DT64	46	50	53	46	33	38	46	31	42	49	58	38	44.0	**49.0**	**48.6**
DT65	45	45	43	NR	20	22	35	26	42	NR	NR	38	35.0	39.0	35.0
DT66	44	43	46	45	24	33	40	29	41	48	NR	36	39.0	**43.0**	**42.9**
DT67	40	37	41	36	29	21	33	23	39	43	39	34	35.0	38.0	38.0

DT68	32	31	32	26	20	16	24	17	29	29	34	30	27.0	29.0	29.3
DT69	37	43	42	34	27	24	28	22	35	37	42	36	34.0	37.0	37.3

☒ **Local bias adjustment factor used**

☐ **National bias adjustment factor used**

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

☒ **Where applicable, data has been distance corrected for relevant exposure**

Notes:

Exceedances of the NO_2 annual mean objective of 40µg/m^3 are shown in **bold**.

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 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

Screening, Significantly Altered Emissions or New Developments

There have been no newly identified sources or significantly increased emissions in the Borough. All new developments with the potential to impact on air quality provide an Air Quality Assessment and are required to mitigate any significant impacts. No developments have been granted planning permission that has significant emissions in 2018.

Diffusion Tube Bias Adjustment Factors

The tubes are supplied and analysed by South Yorkshire Air Quality Samplers. The tubes are prepared by spiking acetone:triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes are then desorbed with distilled water and the extract analysed using a segmented flow auto analyser with ultraviolet detection.

The national factor for 2018 was 0.95 based on 4 studies.

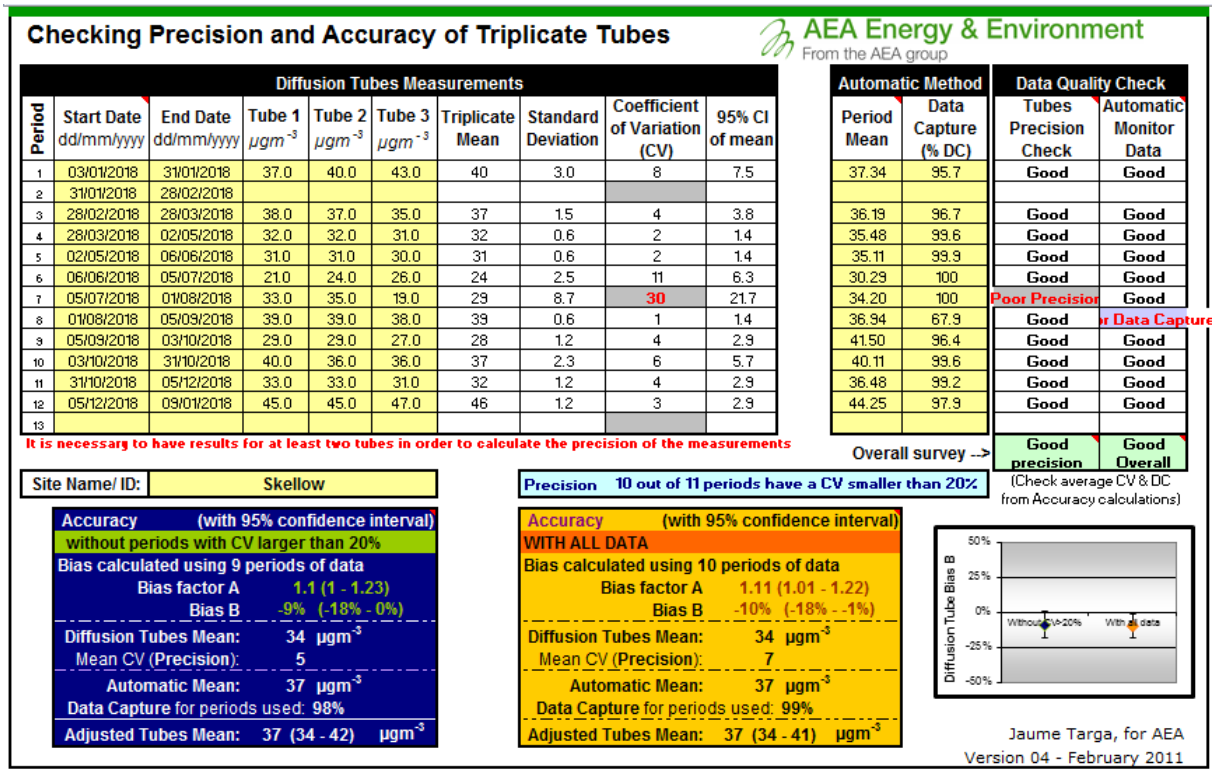
The results were downloaded on the 27 June 2019 from;
http://laqm.defra.gov.uk/bias-adjustment-factors/national-bias.html

Discussion of Choice of Factor to Use

National factors had been used during review and assessment in Doncaster until 2014. The use of national bias had provided consistency, however on recommendations from previous review and assessment feedback a local co-location study was implemented.

The national factor is consistently low and with one of the sites being kerbside in London it was felt that this became unrepresentative.

In 2018 Doncaster Council conducted a co-location study within Doncaster with a bias of 1.1. The results of the bias adjustment are as follows;



Checking Precision and Accuracy of Triplicate Tubes

AEA Energy & Environment
From the AEA group

Diffusion Tubes Measurements

Period	Start Date dd/mm/yyyy	End Date dd/mm/yyyy	Tube 1 µgm^{-3}	Tube 2 µgm^{-3}	Tube 3 µgm^{-3}	Triplicate Mean	Standard Deviation	Coefficient of Variation (CV)	95% CI of mean
1	03/01/2018	31/01/2018	37.0	40.0	43.0	40	3.0	8	7.5
2	31/01/2018	28/02/2018							
3	28/02/2018	28/03/2018	38.0	37.0	35.0	37	1.5	4	3.8
4	28/03/2018	02/05/2018	32.0	32.0	31.0	32	0.6	2	1.4
5	02/05/2018	06/06/2018	31.0	31.0	30.0	31	0.6	2	1.4
6	06/06/2018	05/07/2018	21.0	24.0	26.0	24	2.5	11	6.3
7	05/07/2018	01/08/2018	33.0	35.0	19.0	29	8.7	30	21.7
8	01/08/2018	05/09/2018	39.0	39.0	38.0	39	0.6	1	1.4
9	05/09/2018	03/10/2018	29.0	29.0	27.0	28	1.2	4	2.9
10	03/10/2018	31/10/2018	40.0	36.0	36.0	37	2.3	6	5.7
11	31/10/2018	05/12/2018	33.0	33.0	31.0	32	1.2	4	2.9
12	05/12/2018	09/01/2018	45.0	45.0	47.0	46	1.2	3	2.9
13									

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

Automatic Method		Data Quality Check	
Period Mean	Data Capture (% DC)	Tubes Precision Check	Automatic Monitor Data
37.34	95.7	Good	Good
36.19	96.7	Good	Good
35.48	99.6	Good	Good
35.11	99.9	Good	Good
30.29	100	Good	Good
34.20	100	Poor Precision	Good
36.94	67.9	Good	r Data Capture
41.50	96.4	Good	Good
40.11	99.6	Good	Good
36.48	99.2	Good	Good
44.25	97.9	Good	Good
Overall survey -->		Good precision	Good Overall

(Check average CV & DC from Accuracy calculations)

Site Name/ ID: Skellow

Precision 10 out of 11 periods have a CV smaller than 20%

Accuracy (with 95% confidence interval)
without periods with CV larger than 20%
Bias calculated using 9 periods of data
Bias factor A 1.1 (1 - 1.23)
Bias B -9% (-18% - 0%)
Diffusion Tubes Mean: 34 µgm^{-3}
Mean CV (Precision): 5
Automatic Mean: 37 µgm^{-3}
Data Capture for periods used: 98%
Adjusted Tubes Mean: 37 (34 - 42) µgm^{-3}

Accuracy (with 95% confidence interval)
WITH ALL DATA
Bias calculated using 10 periods of data
Bias factor A 1.11 (1.01 - 1.22)
Bias B -10% (-18% - -1%)
Diffusion Tubes Mean: 34 µgm^{-3}
Mean CV (Precision): 7
Automatic Mean: 37 µgm^{-3}
Data Capture for periods used: 99%
Adjusted Tubes Mean: 37 (34 - 41) µgm^{-3}

Jaume Targa, for AEA
Version 04 - February 2011

The data in the ASR has been corrected with the local factor as a more conservative bias.

PM Monitoring Adjustment

PM_{10} TEOM data for 2011 - 2018 were corrected to gravimetric equivalent using King's College London Volatile Correction Method (VCM) for PM_{10} as prescribed by TG(16)). These results may therefore differ from previous years, which were corrected using the factor as per the relevant procedure at that time. Comparison against previous years should therefore be viewed with caution.

Short-term to Long-term Data Adjustment

Annualisation has, where required, been carried out following the procedure in TG)16), with the following results.

B1 Ratio Annual mean/Period mean = 10/10 = 1
B2 Ratio Annual mean/Period mean = 11/13 = 0.85
Average ratio for DT1 = 0.93
B1 Ratio Annual mean/Period mean = 10/11 = 0.91
B2 Ratio Annual mean/Period mean = 11/11 = 1
Average ratio for DT11 = 0.96

Distance Correction

The procedure and tools recommended in LAQM.TG(16) have been followed to distance correct all relevant diffusion tubes.

QA/QC of Automatic Monitoring

The QA/QC procedure consists of bi-monthly calibrations performed manually on-site by the Local Site Operator (Doncaster Council). Daily data checks are carried out remotely.

An outside contractor performs six-monthly services and all units are covered by a service and maintenance agreement including call-out services.

The last independent audit was carried out in 2018, the analysers tested were found to be satisfactory and any issues addressed.

Data is scaled, validated and ratified in house and includes removing erroneous data and applying relevant calculations in line with the technical guidance LAQM TG(16) to obtain the final data set.

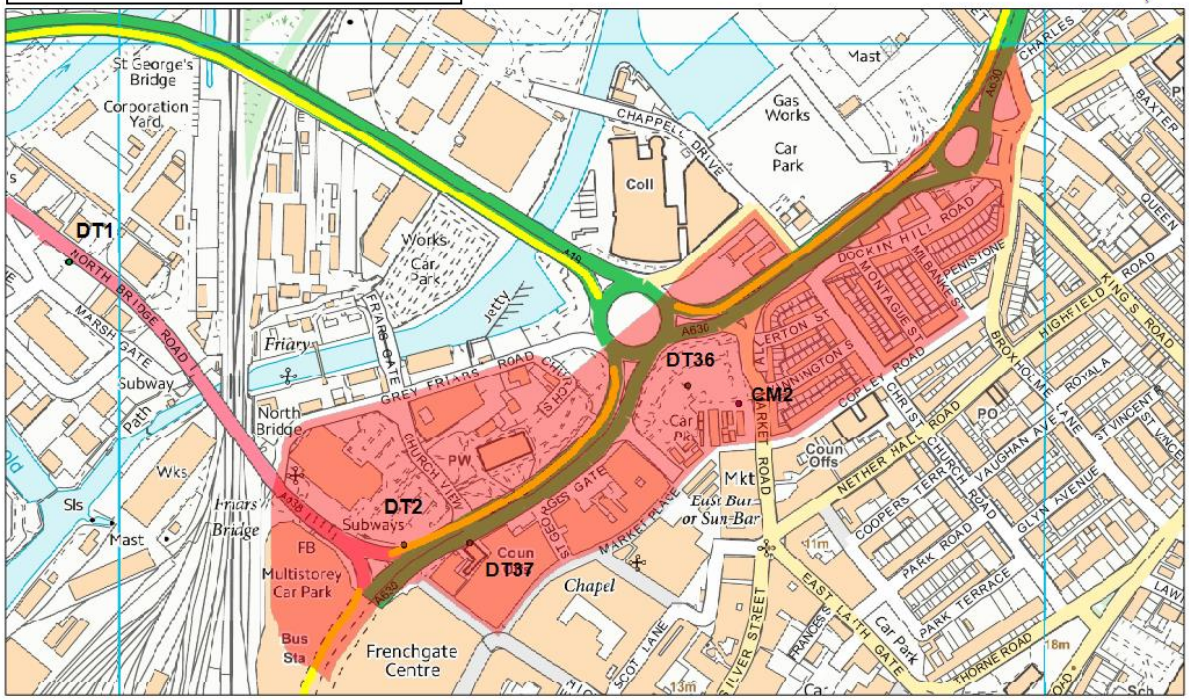
QA/QC of Diffusion Tube Monitoring

The Labortory Performance in AIR NO2 Profciency Testing scheme report covering 2017 lists South Yorkshire Air Quality Samplers as having the necessary number of samples across the five round period as **Satisfactory.** In 2009 procedures have been amended so that the laboratory is in line with the harmonisation procedures.

Precision was good throughout 2018.
https://laqm.defra.gov.uk/assets/tubeprecision2019version0319finalreduced.pdf

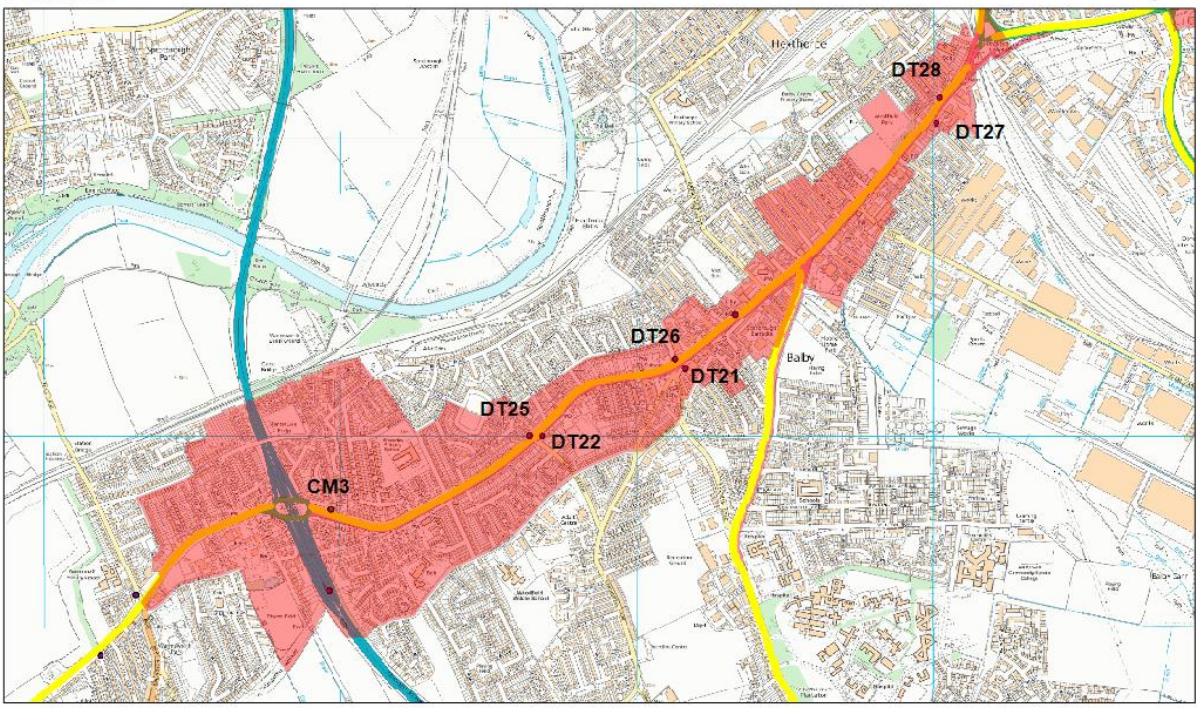
Appendix D: Map(s) of Monitoring Locations and AQMAs

AOMA1



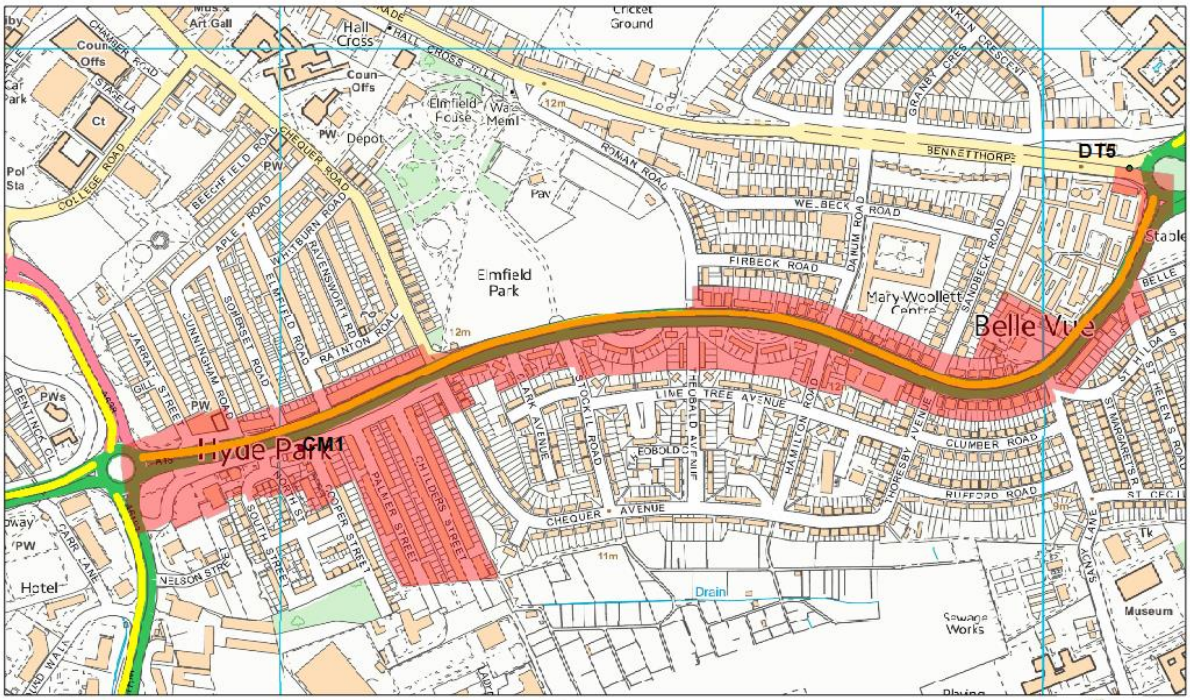
Doncaster

AQMA2

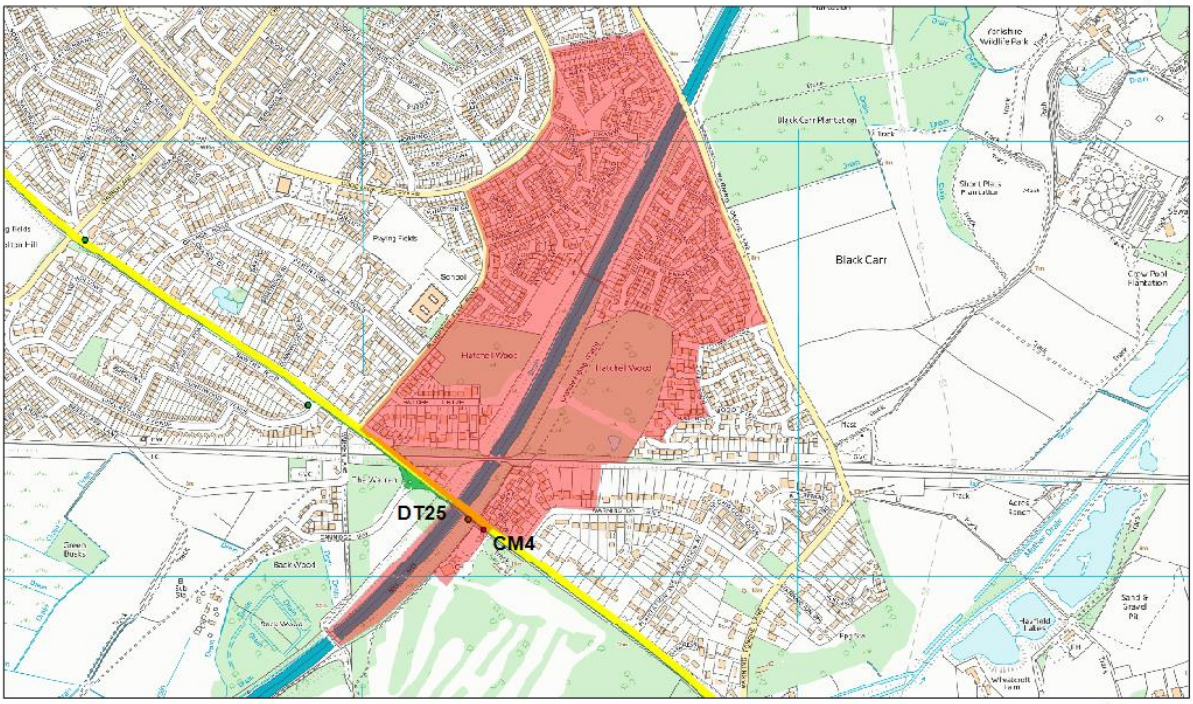


Doncaster

AQMA3


DT5
CM1
Hyde Park
Elmfield Park
Belle Vue
Mary Woollett Centre
Museum
Hotel
Sewage Works
Drain
BENNETHORPE
FIRBECK ROAD
CHEQUER AVENUE
CLUMBER ROAD
RUFFORD ROAD
LINE TREE AVENUE
COLLEGE ROAD
CHEQUER ROAD
ROMAN ROAD
HALL CROSS HILL
CHILDERS STREET
PALMER STREET
NELSON STREET
(c) Crown copyright. License Number 100019782. 2015.
(c) Copyright GeoInformation Group 1997, 2002, 2005 and 2007.
Doncaster

AQMA4


DT25
CM4
Black Carr
Black Carr Plantation
Hatchell Wood
Back Wood
Crew Pool Plantation
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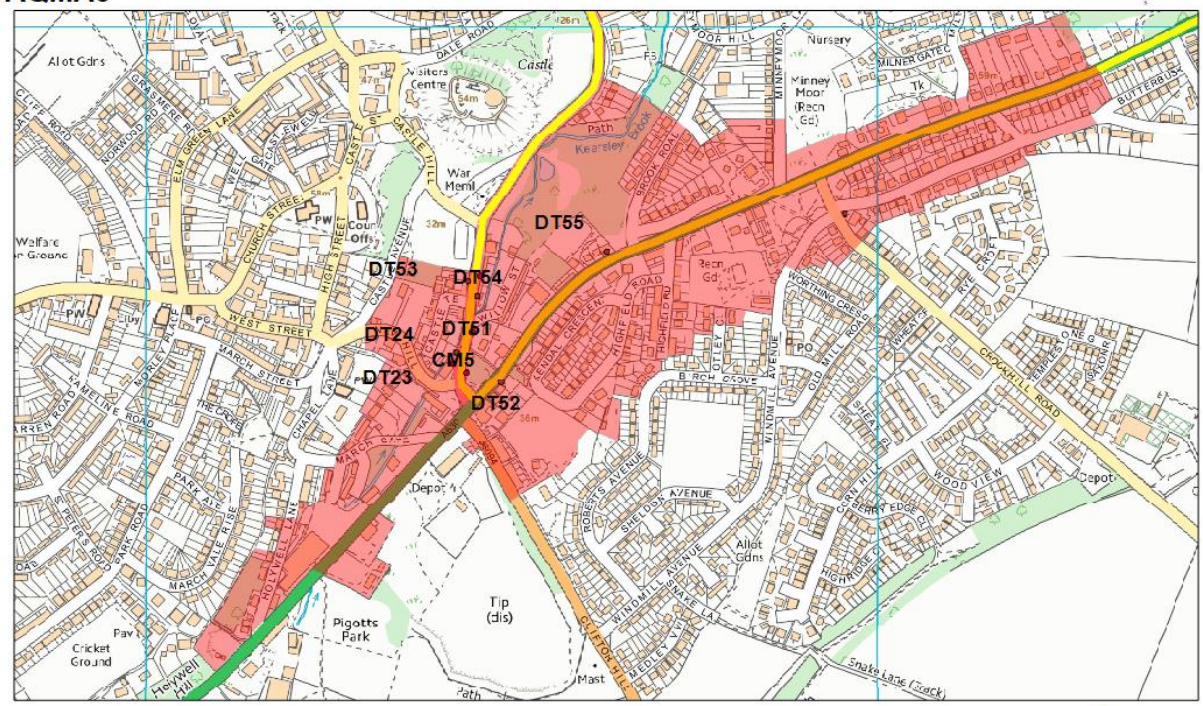
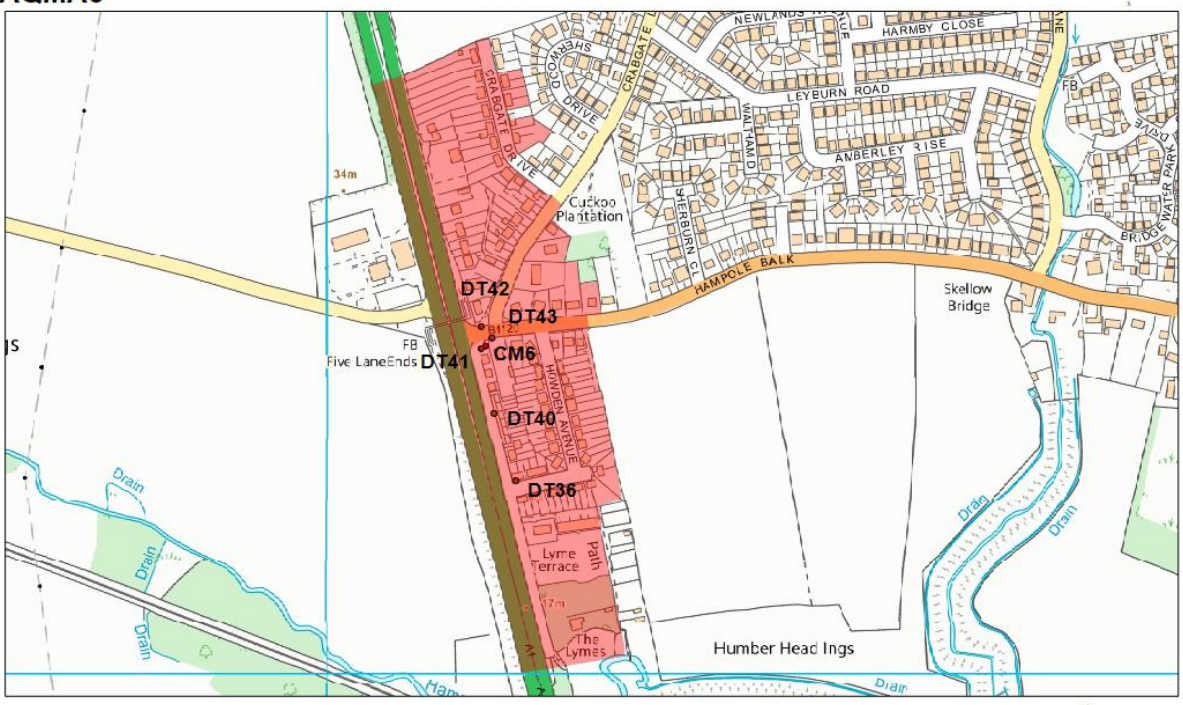
Doncaster

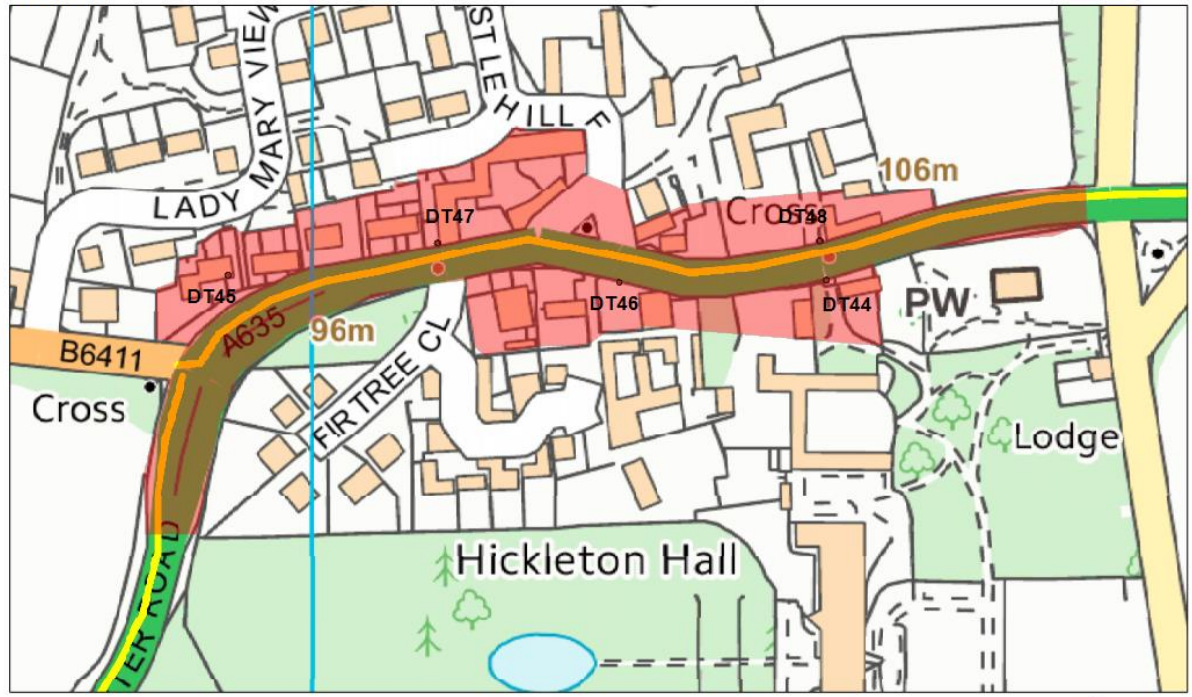
AQMA5



AQMA6



AQMA7



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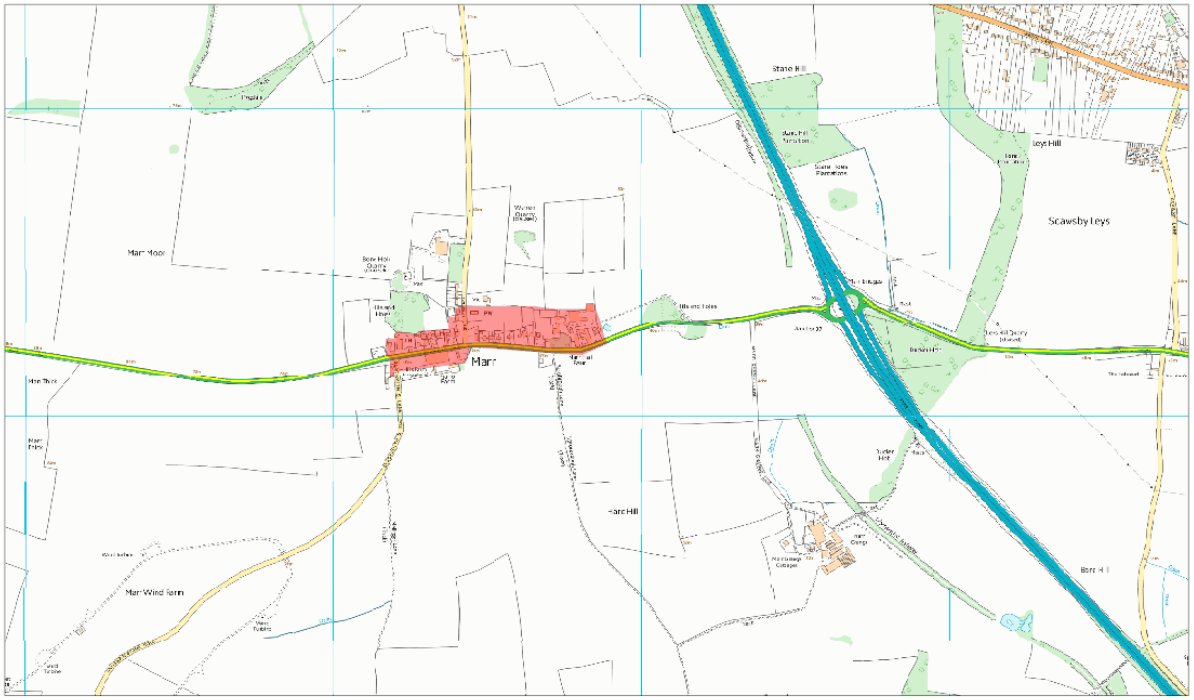
Doncaster

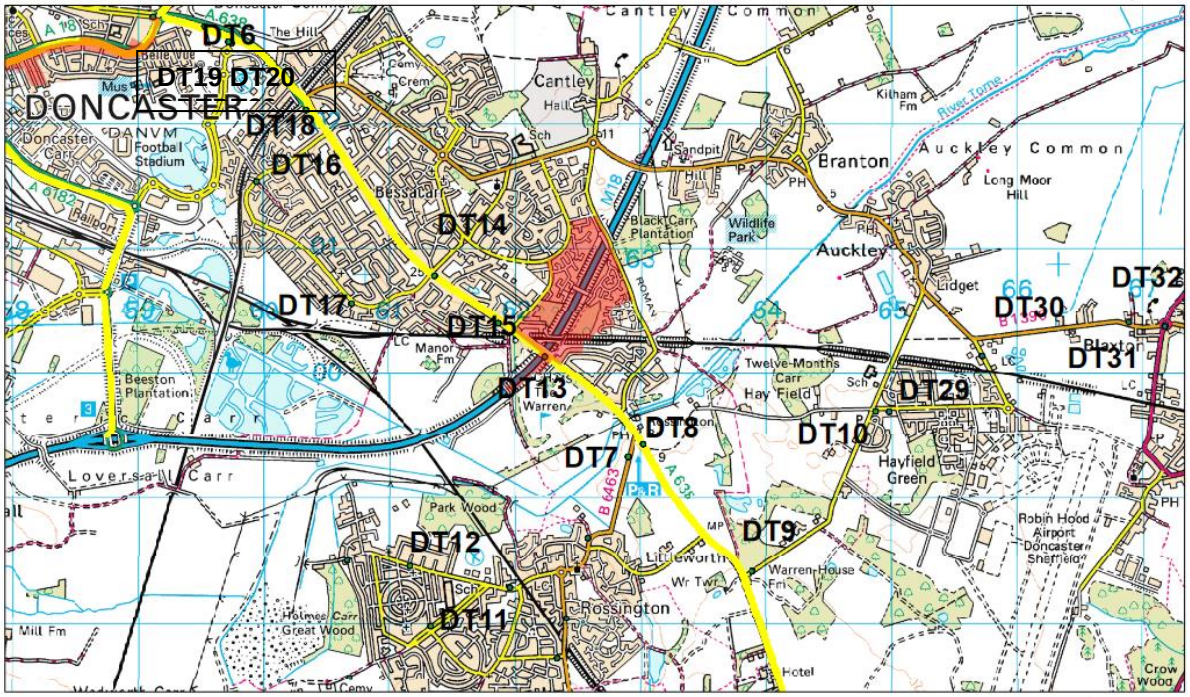
AQMA7A



(c) Crown copyright. License Number 100019782. 2013. (c) Copyright GeoInformation Group 1997, 2002, 2005 and 2007.	Completed By :	Map Reference:	Date :	Scale :
	geraldinep	MARR boundary map LC	13/08/2019	1:3,314

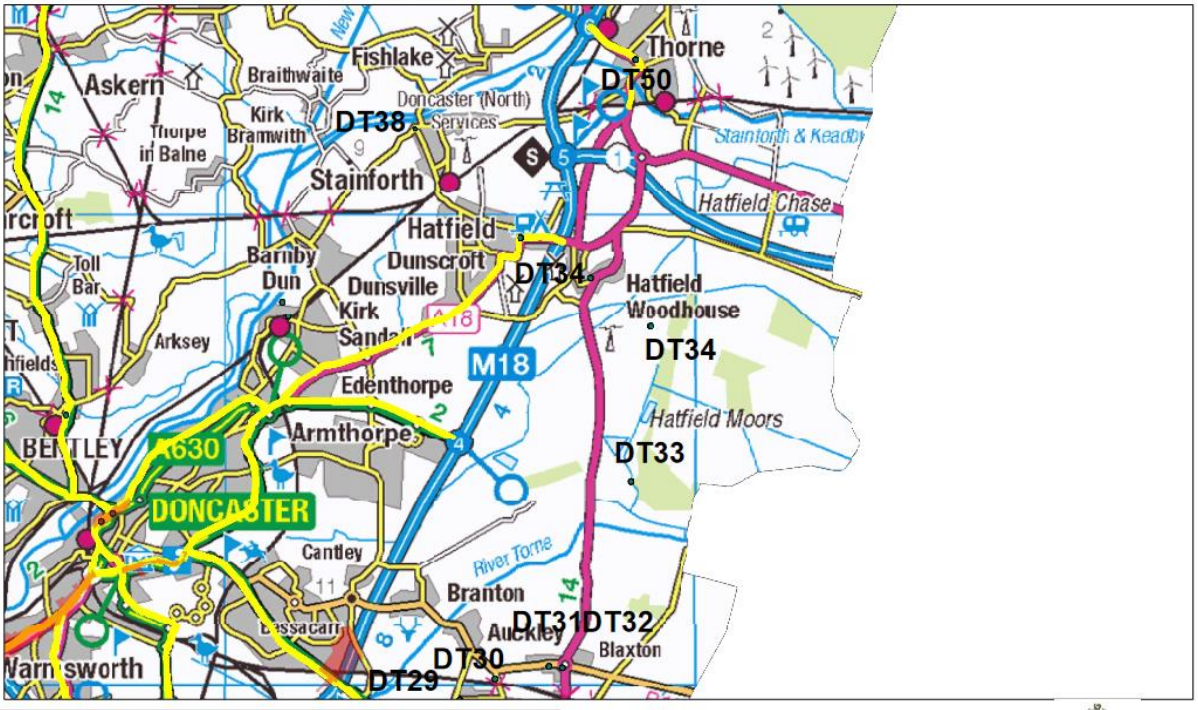
Doncaster

Non-AQMA Monitoring Sites



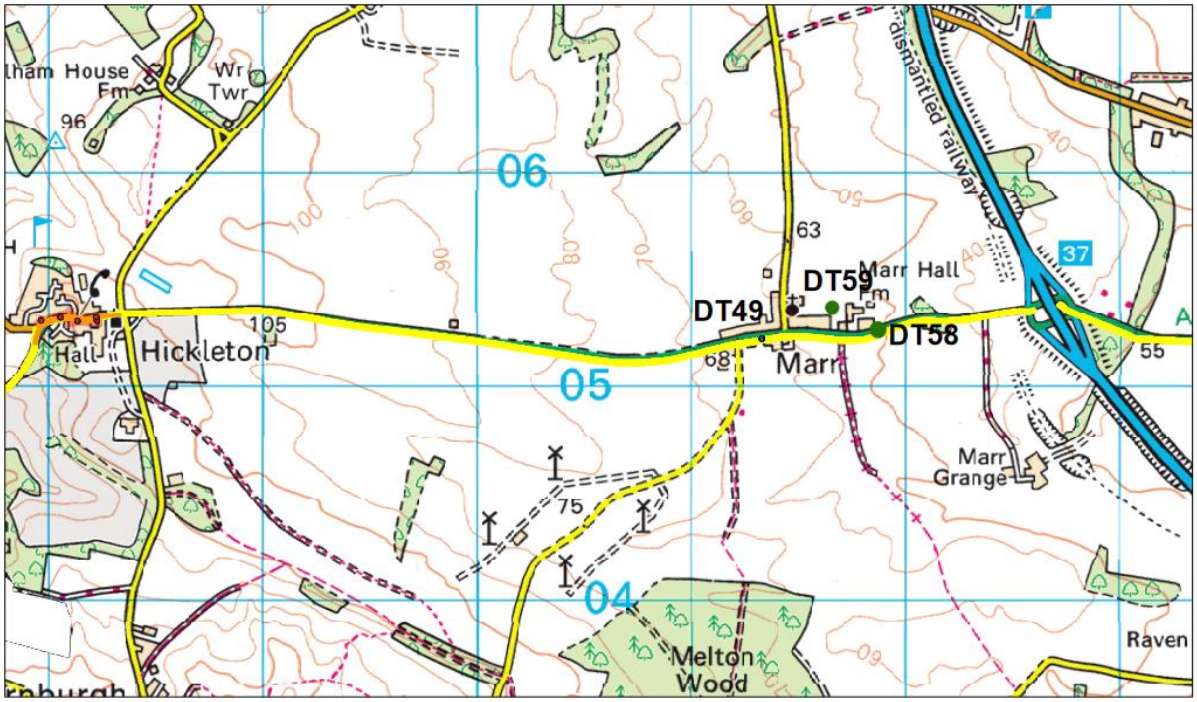
Doncaster

Non-AQMA Monitoring Sites

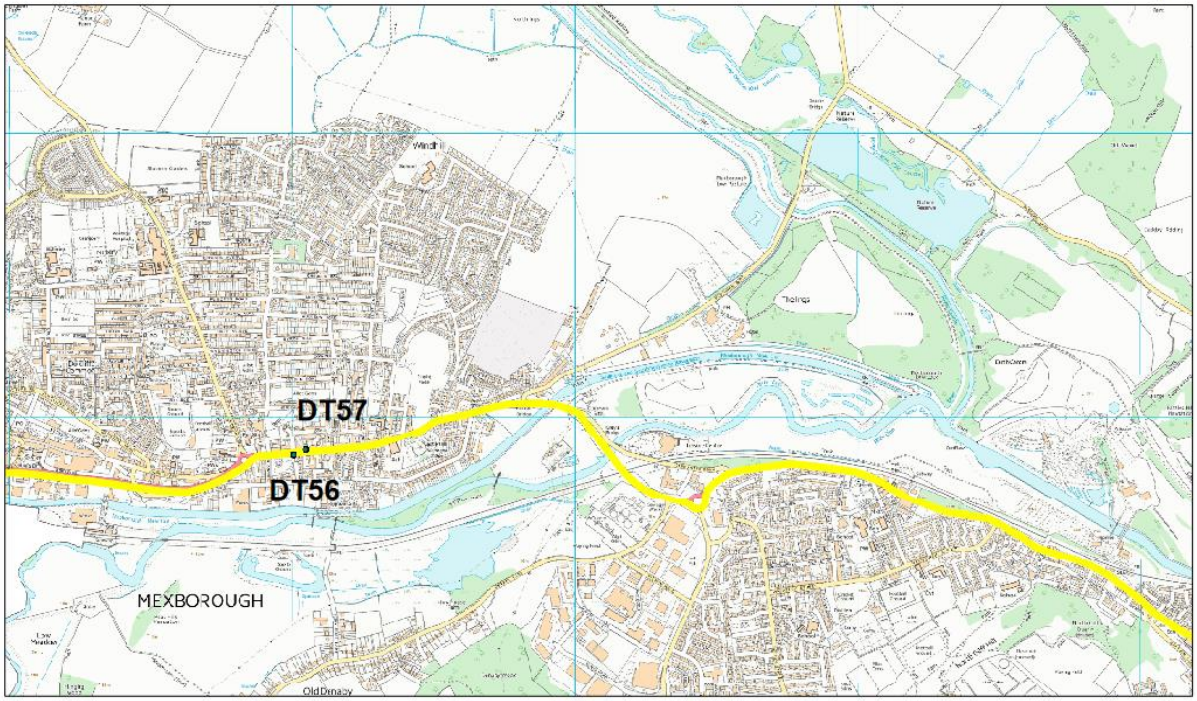


Doncaster

Marr Diffusion Tube Study



Non-AQMA Mexborough



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/m^3).

Appendix F: Public Health Action Plan for PM2.5

Table F.1 Public Health $PM_{2.5}$ Action Plan

Public Health & Air Quality Mapping – Doncaster		
Source	**Examples of action**	**Doncaster Position Statement/Actions**
Kings Fund: To reduce the negative impact of air pollution on health, local authorities can lead by example in their local area by (Kilbane-Dawe 2012):	implementing business engagement programmes to reduce air pollution	Potential through the inMotion business engagement.
	encouraging expansion of council-run income-generating car clubs	DMBC Transport Team currently promote South Yorkshire Car Share scheme on Council website.
	promoting zero emission 'last mile' delivery of as many goods and services as possible	Potential through procurement policy – to be developed using West Yorkshire example.
	organising 'eco-driving' training for taxi-drivers to encourage more fuel-efficient driving, and finding ways to reduce idling at taxi ranks	List of licensed taxi drivers provided to Business Eco-driving project – LSTF.
Invest in longer-term changes with potentially greater impacts, such as:	vertical roof exhausts for buses, and fitting diesel particle filters	CVTF – successful bid for emissions reduction measure on X78 bus route. On board trials showing a reduction of NOx emissions by 35%, roll out of equipment mid-July.
	rolling replacement of boilers with the least polluting models	Warmfront scheme – previously done – ask RS/KG
	ensuring that new buildings are air quality neutral	This could be developed through the new guidance being developed across Yorkshire. Pollution Control intends to adopt this approach.
	encouraging people to make more journeys by bike, through integrated and harmonised cycling networks.	Doncaster Cycling Strategy adopted December 2014. Doncaster Cycling Festival 2015
Warning/informing the public and professionals		In the event of high levels of air pollution, PH and Air Quality will work together to provide appropriate messages for staff and the public.
Defra Website	Local authorities can:- •Encourage schemes like ECOSTARS that recognise excellent levels of environmental and energy saving performance for the vehicles that operate within their area. •Introduce intelligent transport systems that maximise the efficiency of the highway network and also give real time information on traffic delays and	South Yorkshire developed the ECOstars scheme, LC sits on the steering group. There are 9 fleet operators based in Doncaster that are members of ECOstars including Doncaster Council. Transportation may have more detail on this but these actions have been available in Doncaster for some

	journey times, car parking availability, and bus arrival times; together, these allow people to make better informed travel choices and also reduce traffic emissions. See example (PDF, 54.3KB, 10 pages). •Incorporate air quality into planning considerations for new developments and refurbishments. See example (PDF, 410KB, 37 pages) •Promote energy efficiency and sustainable transport to residents and businesses in the borough and putting in the necessary infrastructure to enable people to reduce the emissions they produce. See example.	time.http://www.doncaster.gov.uk/Images/Air%20Quality%20Planning%20Guidance%20Addendum%20v12011537-110386.pdf InMotion LSTF scheme promotes sustainable travel to businesses in South Yorkshire. The LTP has funded energy efficiency measures and renewable energy on transport assets across South Yorkshire.
	Public Health professionals can also help to: • explain to their local population the impact of air pollution on health; • • tailor messages to target those members of the public particularly susceptible to air pollution and to raise understanding that improving air quality would help to improve healthy life expectancy and reduce early death from cardio-respiratory diseases; • work with others to promote initiatives to facilitate active travel (for example Healthy Schools Programmes, school travel plans; cycle to work schemes etc • raise awareness of the need to improve air quality through linking to other public health issues such as obesity and through working with Health and Wellbeing Boards to include air quality in Joint Strategic Needs Assessments and Health and Wellbeing Strategies.	Information provided on the DMBC website and SY Care4Air. Health advice provided is tailored to address some specific conditions. Public Health sit on the cycling strategy working group and Doncaster Active Partnership. Actively promote cycling and walking via Get Doncaster Walking/ Cycling campaigns & Change4Life campaigns. Doncaster Council currently manage a number of initiatives to encourage cycling including: Bike It Officer for schools, Cycle/Walk Boost, Bikeability training.
Other actions/Areas of Work		**Electric vehicles** – This is a South Yorkshire Scheme, managed by Sheffield City Council it aims to deliver; • a grant to lease hire an electric car or van for 1,2,3 or 4 years, and a standard charge point installation at their premises for circa 80 small and medium enterprises in South Yorkshire • In each South Yorkshire Local Authority there will be 2 fast chargers sited in off street council operated car parks • An Office for Low Emission Vehicles funded network of 20+ publicly accessible rapid chargers across South

		Yorkshire– these take recharge times down from 6/8 hours to 30 minutes to support these vehicles (and others) whilst out and about • Each vehicle will be tracked to measure miles driven, carbon saved and fuel savings. **Compressed Natural Gas Feasibility** A considerable amount of work has been carried out in South Yorkshire to establish the most suitable sites for compressed natural gas (CNG) refuelling stations. There are several excellent potential sites in South Yorkshire where the high pressure gas main is suitably close to the surface and close to the major road network. A full feasibility report is available and investor interest is increasing. The Council shall promote this work where appropriate. **Hydrogen Vehicle Trail** In partnership with ITM power a hydrogen re-fuelling site is to be brought back into use along with a Hyundai vehicle which will be available to Doncaster Council for trails over 3 years. The aim is to demonstrate the benefits and practicalities of hydrogen vehicles. The Council will feed into the trail and if suitable promote the vehicles in the local area.

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
LAQM	Local Air Quality Management
MRN	Motorway Road Network
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
SCR	Sheffield City Region
SO_2	Sulphur Dioxide
TEOM	Tapered Element Oscillating Microbalance
ULEV	Ultra-Low Emission Vehicles

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