

2019 Air Quality Annual Status Report (ASR)

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

November 2019

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Derbyshire County Council; Endorsement from Director of Public Health

Air pollution has a significant effect on public health, and poor air quality is the largest environmental risk to public health in the UK. Long-term exposure to air pollution has been shown to reduce life expectancy, due to its impact on cardiovascular and respiratory diseases and lung cancer. Many everyday activities such as transport, industrial processes, farming, energy generation and domestic heating can have a detrimental effect on air quality.

The annual status report is fundamental to ensuring the monitoring of trends and identification of areas of local air pollution exposure. The cumulative effect of a range of interventions has the greatest potential to reduce local air pollution and improve population health, as such the annual status report and associated action plans provide an opportunity to engage a range of partners.

Public health will continue work with partners to advocate for improvements in Air Quality and provide expertise and evidence to inform policy.

A handwritten signature in black ink, appearing to read 'Dean Wallace', with a long, sweeping horizontal stroke at the end.

Dean Wallace, Director of Public Health, Derbyshire County Council

May 2019

Executive Summary: Air Quality in Our Area

Bolsover District Council is the authority responsible for monitoring and assessing air quality in its area. However, the implementation of many of the measures that will bring about improvements in air quality are controlled by other organisations such as the Highways Agency and Derbyshire County Council. The County Council now also has responsibilities relating to public health in the county. Collaborative working is therefore essential in order to address local air quality. In preparing this report Bolsover District Council has consulted with the County Council's Senior Public Health Manager with responsibilities for air quality, who has direct links with relevant County Council functions.

This document reports the results of air pollution monitoring undertaken by the Council and details new and ongoing initiatives that contribute to improving air quality for 2018.

The Council currently has three Air Quality Management Areas (AQMAs) which were declared in between 12 and 15 years ago where the air quality has previously been determined as exceeding the concentration for annual mean nitrogen dioxide Air Quality Objective.

The AQMAs relate to road traffic emissions from the M1 motorway, slip roads and access roads. The motorway runs in a north – south direction through the district at around Junctions 28 and 30. The data shows that for the year covered by this report there were **no exceedances** of this Objective. From the Council's monitoring, there has been no exceedance of the annual mean Air Quality Objective in any of the AQMAs since 2012. In the 2017 ASR it was recommended that the Council commences the procedure for revoking the AQMAs by undertaking a detailed assessment at the earliest opportunity. The detailed assessment was delayed until 2018 for two reasons, firstly to ensure that the apparent reduction was not just because of year on year variations due to meteorological factors and, secondly, that it was not because of the motorway alterations which had, for at least 18 months prior to April 2016, been subjected to extensive road works involving 50mph speed limits and lane closures as it has been converted to a 4-lane smart motorway. It was therefore recommended that this decision was delayed until there was at least one full year's data since the opening of the smart motorway to ensure that the road

works and reduced speed limits have not artificially reduced the nitrogen dioxide concentration over that period. This did not appear to be the case.

The detailed assessment, which comprised a review of past monitoring data and recent and proposed developments, was undertaken on the Council's behalf by Bureau Veritas. **It was concluded that the two Barlborough AQMAs should be revoked but that the South Normanton AQMA should, for the time being at least, remain in force as the nitrogen dioxide concentration in 2017 was marginally below the 40 µg/m³ annual mean Air Quality Objective limit (39.8 µg/m).**

Bolsover District Council are now in the process of revoking the two Barlborough AQMAs. Monitoring in the South Normanton AQMA continues, however as the 2018 nitrogen dioxide annual mean concentration fell to 34.8 µg/m, revoking this AQMA may be considered should this level continue to fall.

The monitoring locations were reviewed at the end of 2015, and a new site at the junction of Barlborough Rd / Creswell Rd / Rotherham Road and North Road, Clowne was established. This is a traffic light controlled junction and is known to have frequent queues of traffic at busy periods. There are also dwellings in very close proximity to the carriageway. The annual mean nitrogen dioxide concentration for 2016 at the newly created site (Tube Ref 30) was found to be 39.2µg/m³, which is extremely close to the 40µg/m³ Air Quality Objective. It was recommended that additional monitoring locations should be set up at other dwellings around the junction to determine whether any further action was required. This was undertaken from July 2017 and monitoring has found that the annual mean (annualised) Air Quality Objective is below the Air Quality Objective at all these monitoring locations.

Section 2 of the report sets out the actions the Council and partner organisations have taken or are taking to improve air quality in the area.

The Annual Status Report includes a section on the effects that very small particles called PM_{2.5} have on public health (Section 2.3). These particles can be suspended in the air for long periods of time and can travel great distances. These particles can lodge deep in the lungs and pass into the bloodstream and have been attributed to causing premature mortality, allergic reactions and cardiovascular disease.

It is important that air quality is not just considered as a local problem as it transcends the Council boundaries. Officers of the Environmental Protection team of the Joint Environmental Health Service (a shared service of both Bolsover and Bolsover District Councils) have been actively participating in and contributing to the Derbyshire County and City Air Quality Working Group which comprises officers from a number of relevant disciplines at County Council, District Councils and the voluntary sector whose policies, decisions and actions can bring about improvements in air quality. The Group, led by the Public Health Directorate of Derbyshire County Council links to the Derbyshire Chief Regulators Group, The East Midlands Air Quality Group and Public Health England (PHE) and is a sub group of the Health and Wellbeing Board.

Air Quality in Bolsover

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.

The Bolsover District has a long industrial history centred principally around mineral extraction such as coal mining (deep mines and opencast) and limestone extraction. These core industries had extensive supporting industries such as engineering and coal carbonisation / chemical works. These have been in decline for a number of decades leaving a legacy of environmental issues such as land contamination, which is now being remediated and redeveloped.

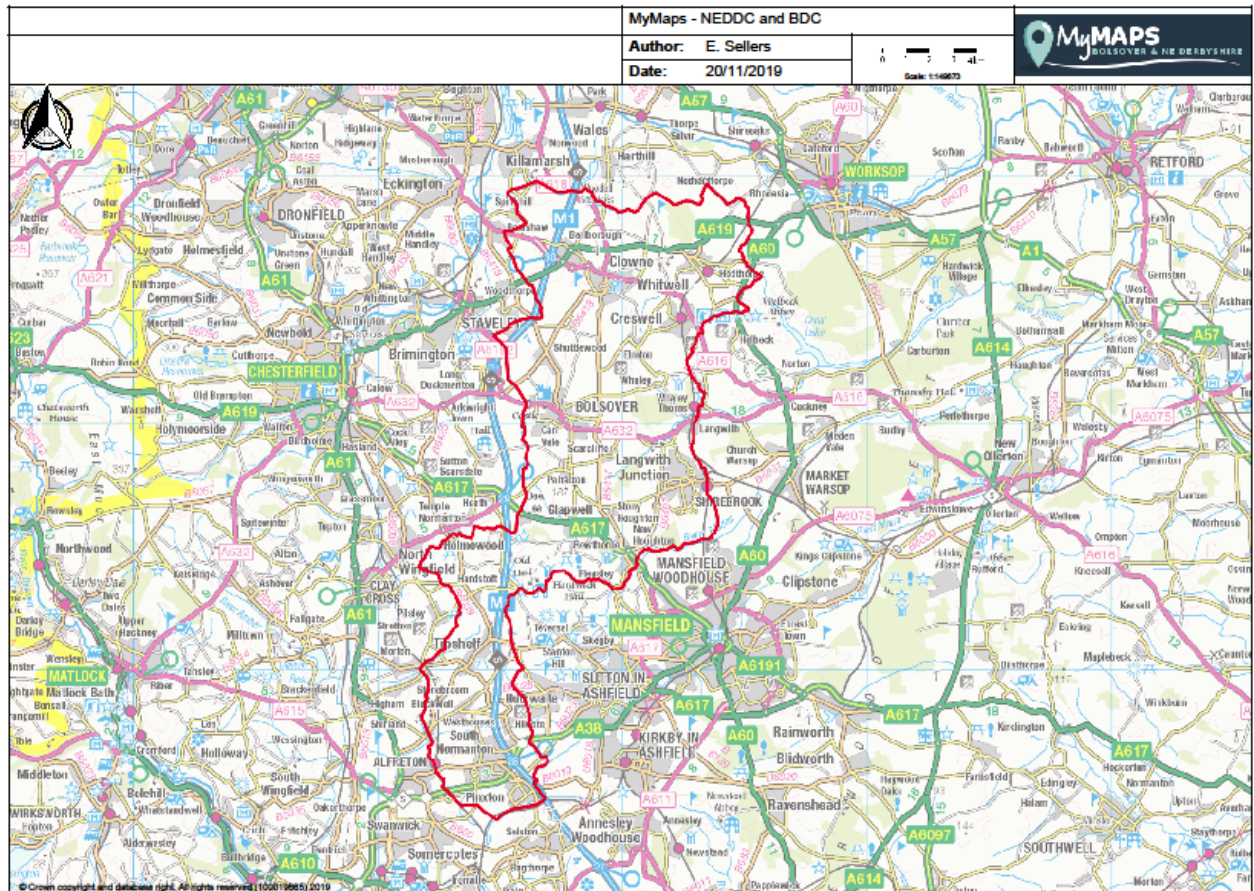
A map of the area showing the main villages and transport infrastructure is shown at Figure 1.1.

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

Figure 1.1 Map of the Bolsover District Council area



The M1 motorway runs through the length of the district in a north – south direction with the junctions 28 and 30 being in the Council’s area. These junctions were the focus for air quality management in the district which resulted in the declaration of three air Quality Management Areas (AQMAs), one in South Normanton around Junction 28 and two in Barlborough close to Junction 30. However, the two AQMAs in Barlborough are currently in the process of being revoked due to improvements in the level of nitrogen dioxide in these locations.

Details of these can be found at <http://uk-air.defra.gov.uk/aqma/list>

The extent of the Air Quality Management Area is shown in Figures 1.2 to 1.4.

Figure 1.2 South Normanton Air Quality Management Area

Carter Lane East, South Normanton

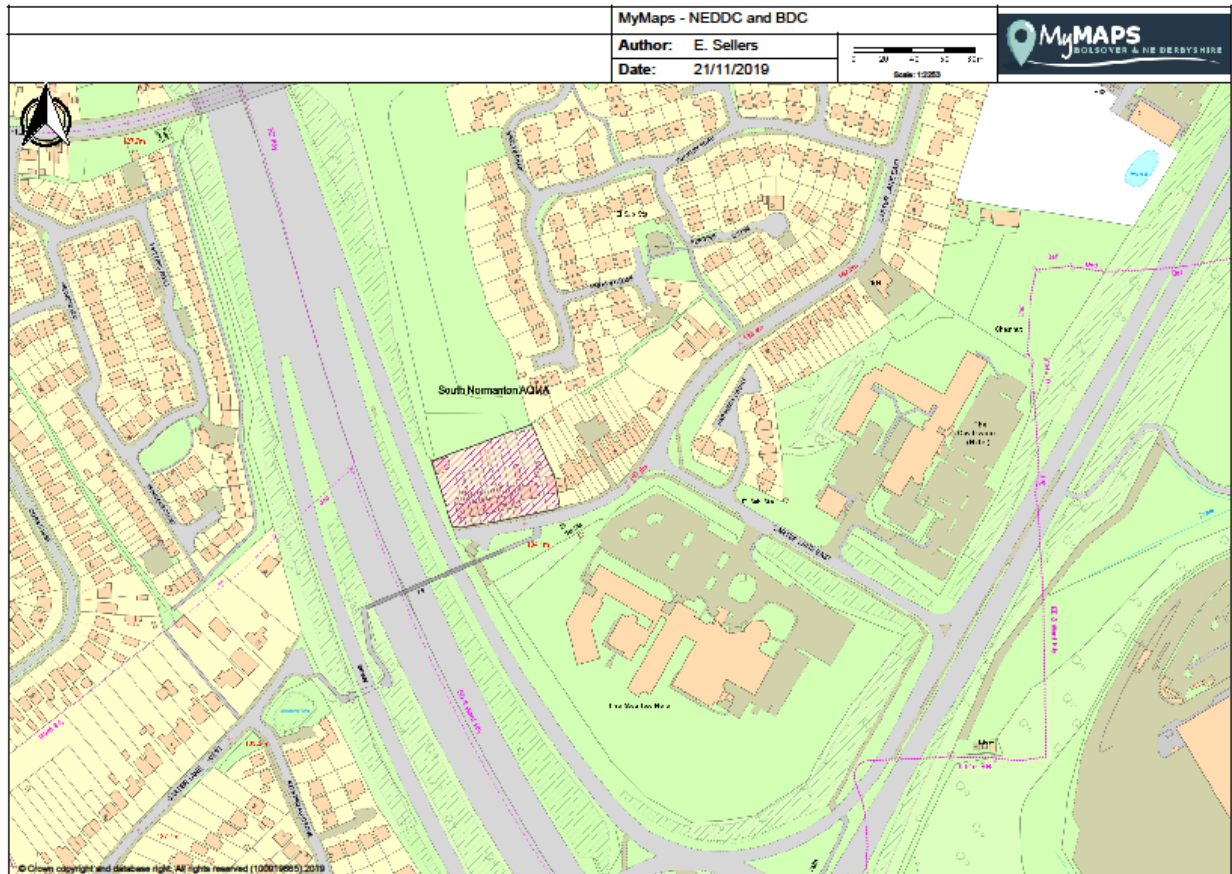


Figure 1.3 Barlborough No1 Air Quality Management Area

14 Chesterfield Road, Barlborough

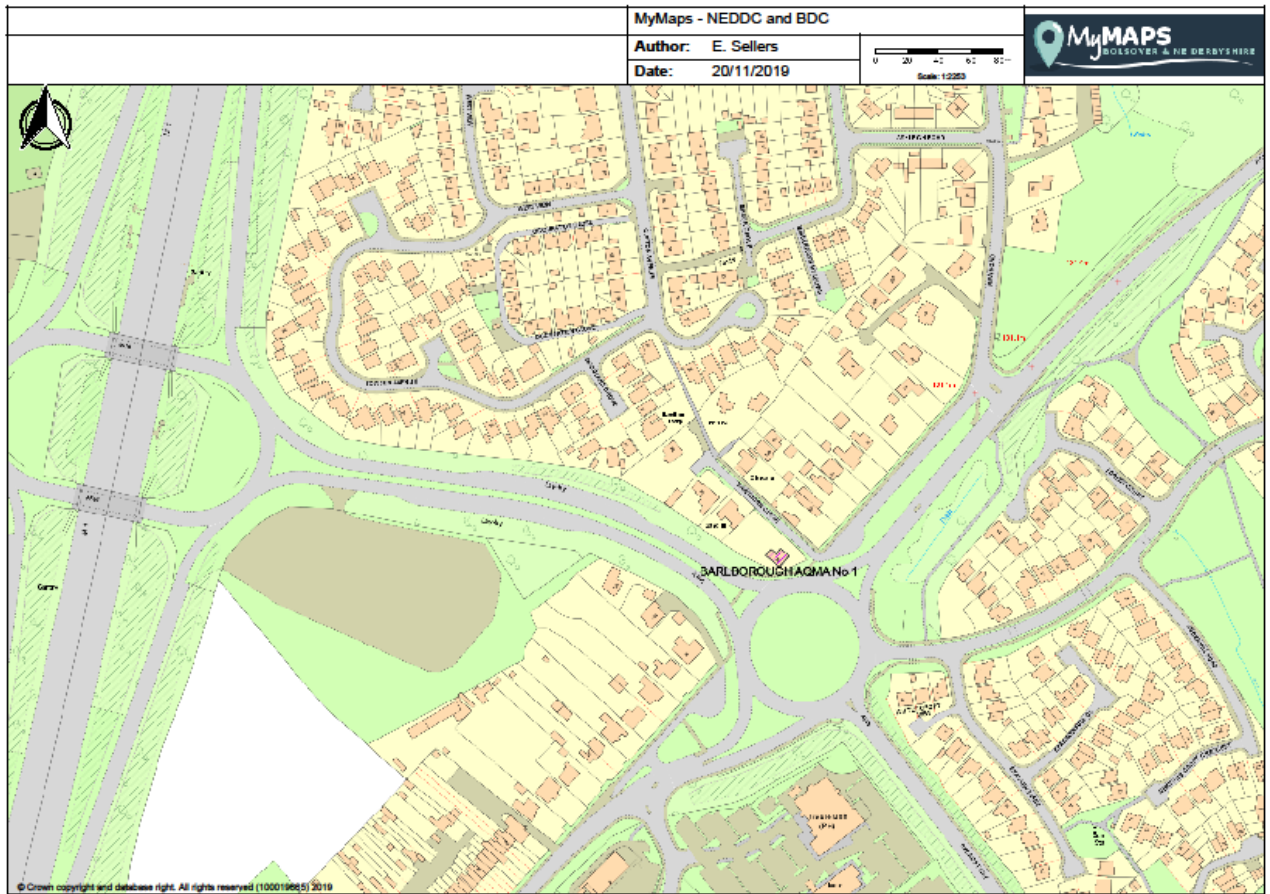
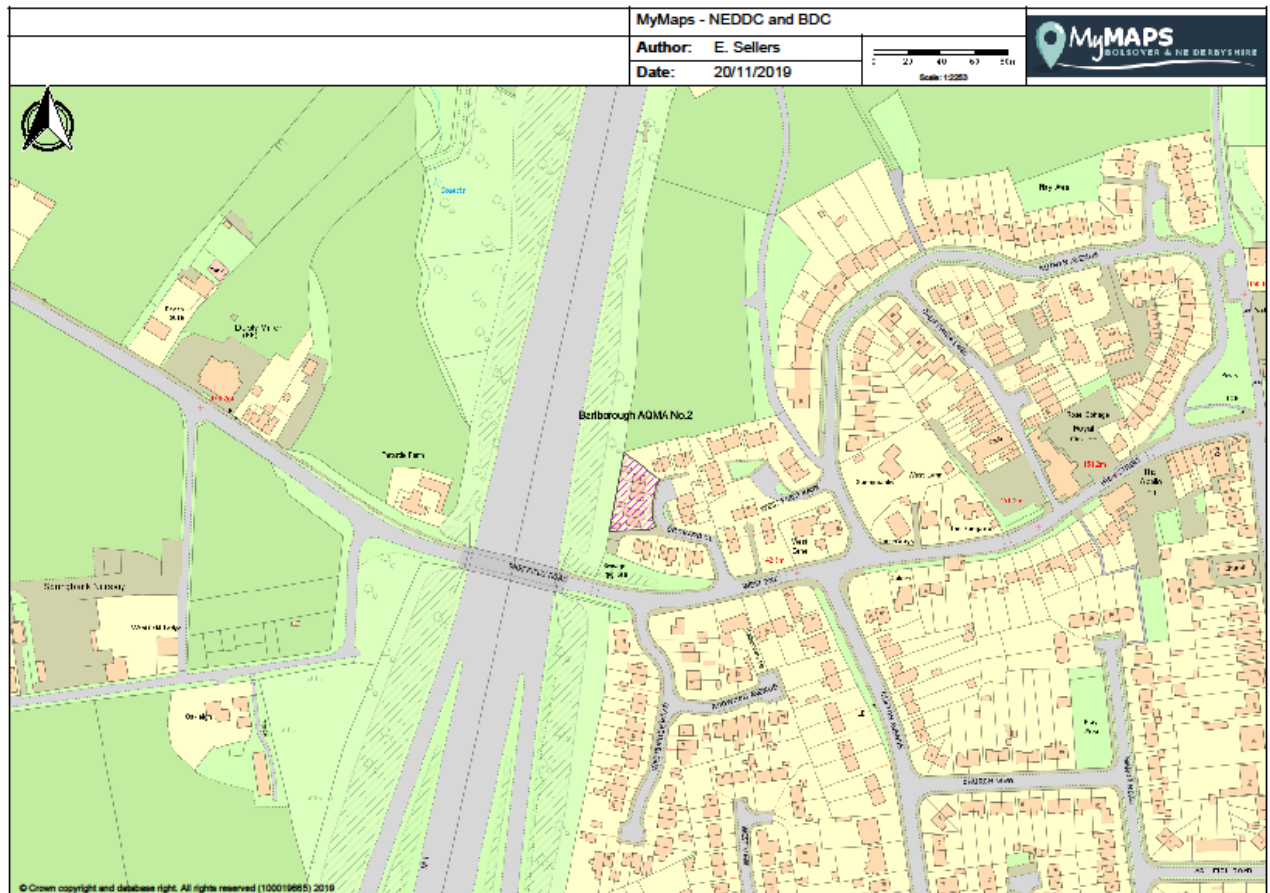


Figure 1.4 Barlborough No 2 Air Quality Management Area

Orchard Close, Barlborough



The area has a heavy industrial past, particularly minerals extraction (coal mining and limestone quarrying) which historically saw high proportions of coal being used in domestic heating exacerbated by the miners' concessionary fuel allowances. Due to the impact of extensive coal burning on air quality, the District Council (after being granted a 10 year derogation on complying with the then EU Air Quality limits for smoke and sulphur dioxide) completed 100% coverage with Smoke Control Areas in the 1990s. The Council is aware that there have been new housing developments in the district since that time and also in recent years the popularity of domestic biomass heating (wood burners) and the potential effects of this are kept under review through the Air Quality screening process and, for biomass fuel use on a larger scale, through the development control regime.

Between 2015 and 2016 the M1 motorway was converted into a 4-lane smart motorway. After noting a significant reduction in annual mean nitrogen dioxide concentrations at all three AQMAs since 2012, the Council delayed acting on this in order that there was some certainty that it is a genuine reduction and not due to annual variations or the lane closures and reduced speed limit to 50mph throughout the period of the extensive road works over almost 2 years.

Having undertaken monitoring since the opening of the smart motorway we are confident that the annual mean nitrogen dioxide concentrations have fallen to a level significantly below the $40\mu\text{g}/\text{m}^3$ Objective in the two Barlborough Air Quality Management Areas. The reduction is more modest in the South Normanton AQMA which at one of the monitoring locations was just marginally below the $40\mu\text{g}/\text{m}^3$ Objective in 2017 (Site ref 15; $39.8\mu\text{g}/\text{m}^3$ in 2017) but has since decreased further in 2018 ($34.8\mu\text{g}/\text{m}^3$).

Since 2017, which was the first full year since the opening of the smart motorway, the annual mean nitrogen dioxide concentration for the worst affected (nearest) property to the motorway in each of the three AQMAs was as follows:

South Normanton AQMA - 2017 - $39.8\mu\text{g}/\text{m}^3$ 2018 - $34.8\mu\text{g}/\text{m}^3$

Barlborough No1 AQMA - 2017 - $29.8\mu\text{g}/\text{m}^3$ 2018 – $28.7\mu\text{g}/\text{m}^3$

Barlborough No2 AQMA - 2017 - $28.4\mu\text{g}/\text{m}^3$ 2018 - $27.1\mu\text{g}/\text{m}^3$ (mean of triplicate tubes)

In 2017 a Detailed Assessment was commissioned which concluded that the two Barlborough AQMAs should be revoked. The Council has now implemented the procedure for revoking the two Barlborough AQMAs.

Although the South Normanton AQMA reported as being below the air quality objective, in 2017 it was so close to it at $39.8\mu\text{g}/\text{m}^3$ that the AQMA is being retained for the time being at least.

Although there have been no specific problem areas identified locally, nationally there is currently great interest in the extent that very small particles called $\text{PM}_{2.5}$ impact on public health. In line with national guidance the Council is giving consideration to this pollutant and actions that can be taken to minimise its impact.

The Council continues to work with partner organisations including the Highways Agency and their consultants and the Director of Public Health in respect of air quality in the District.

Actions to Improve Air Quality

As stated above, plans to revoke the two Barlborough Air Quality Management Areas are underway. The Council will continue to closely monitor the South Normanton AQMA. A list of specific measures that the Council and its partner organisations are involved with that will help to improve air quality in the area is shown at Table 2.2 later in this report.

Bolsover District Council continues to work with other partners to deal with Air Quality concerns including neighbouring local authorities, Derbyshire County Council in their role as the Highways Authority, the Director of Public Health at Derbyshire County Council and Public Health England, and where appropriate will participate in projects to improve Air Quality.

The Council is responsible for the regulation of a number of Part A2 and Part B industrial installations that are of significance in terms of air quality. Each process / installation is regulated under the Environmental Permitting (England and Wales) Regulations 2016 and regularly inspected by the Joint Environmental Health Service (in line with national guidance which sees greater regulatory input at the premises posing the greatest risk) to ensure they are controlling their emissions to atmosphere in accordance with national guidance.

The Council's LCV\LGV vehicle fleet meets the current Euro6 standard and all its refuse collection vehicles operate on low sulphur 80/20 bio-diesel. We have reviewed waste collection, grounds maintenance and street cleansing operations and established measured cyclical maintenance programs across the Council which has enabled us to review our vehicle fleet requirements to achieve optimised utilisation.

The Council is committed to working with partners from across the county to proactively engage with end users that are at high risk of fuel poverty. The Council works with all internal departments, Derbyshire County Council, local installers and agencies to deliver a number of energy cost reduction measures. Such schemes involve the installation of funded modern condensing boilers, insulation and heating controls that allow vulnerable residents to take control of their heating. The Council

is also committed to assisting vulnerable people through the fuel switching process in order to ensure that they are getting the most competitive fuel supply.

The Council is also committed to reducing the fuel cost and carbon footprints to its own housing and commercial stock. Together with our Strategic Partner and neighbouring authority, North East Derbyshire District Council, we have received approximately £129,600 funding from Caden Affordable Warmth Solutions to replace multiple gas connections (of which 108 where in Bolsover District) with new individual condensing boilers from very old inefficient communal boilers and old coal back boilers with new gas connections and ultimately modern gas boilers via the funding below.

We have secured £393.360 of funding from the Warm Homes Fund and ECO Fund in order to achieve 138 heating upgrades across both districts.

Where gas cannot be connected to properties at reasonable cost, the Council has invested in air source heat pumps. Innovative hydrogen fuel cell technology has also been installed in a sheltered scheme to supplement the electricity supply and heat the flats very efficiently. In Bolsover, the Council is committed to building new stock that meets the highest standards for the BRE Code for Sustainable Homes and this is including solar electricity.

Regarding its own commercial stock, the council has invested in fitting solar panels to its town hall at The Arc, Clowne. This will generate around £600,000 of income over its lifetime in Feed-in-Tariffs and savings. This is looking to be rolled out across it Riverside Depot in Doe Lea and also the Pleasley Mills industrial area. Innovative infrared heating technology has also been installed in the Pleasley Mills site and this made a major difference to the workers that used to be cold during the winter months.

Areas where there has been programmed regeneration activities and significant new development continue to be actively considered by the Council for their impact on air quality.

Recent Government guidance on tackling air quality has seen the Council form stronger links specifically in respect of air quality with key partners such as the County Director of Public Health and County Council Highway Planners. Officers of LAQM Annual Status Report 2019

the Council have been instrumental in setting up and participating in the Derbyshire County and City Air Quality Working Group.

Conclusions and Priorities

The 2019 ASR has confirmed that the two Barlborough Air Quality Management Areas (AQMAs) are in the process of being revoked and that the South Normanton AQMA, although being below the Air Quality Objective for the annual mean nitrogen dioxide concentration should remain in force for the time being. Across the Council's area as a whole the annual mean nitrogen dioxide concentration has been steadily falling over the past few years.

It was reported in the 2017 ASR that we had concerns about the nitrogen dioxide concentration at dwellings around a busy traffic light controlled crossroads in Clowne (North Road, Creswell Road, Rotherham Road, Barlborough Rd) and that we planned to extend the diffusion tube monitoring around the crossroads to better understand the situation. The monitoring was increased to seven tubes to give a good coverage on all roads around the junction. The annualised data has revealed that the nitrogen dioxide concentrations are below the air quality objective. There are however several large residential developments planned in the Clowne area (currently in the planning process). These have been subject of an air quality assessment as part of the planning process, however it has been decided to retain the monitoring sites for the current year to confirm the annual mean concentration and it is likely that a selection of the tubes will be retained in the medium term to measure the impact on air quality over the coming years in the event of these developments proceeding.

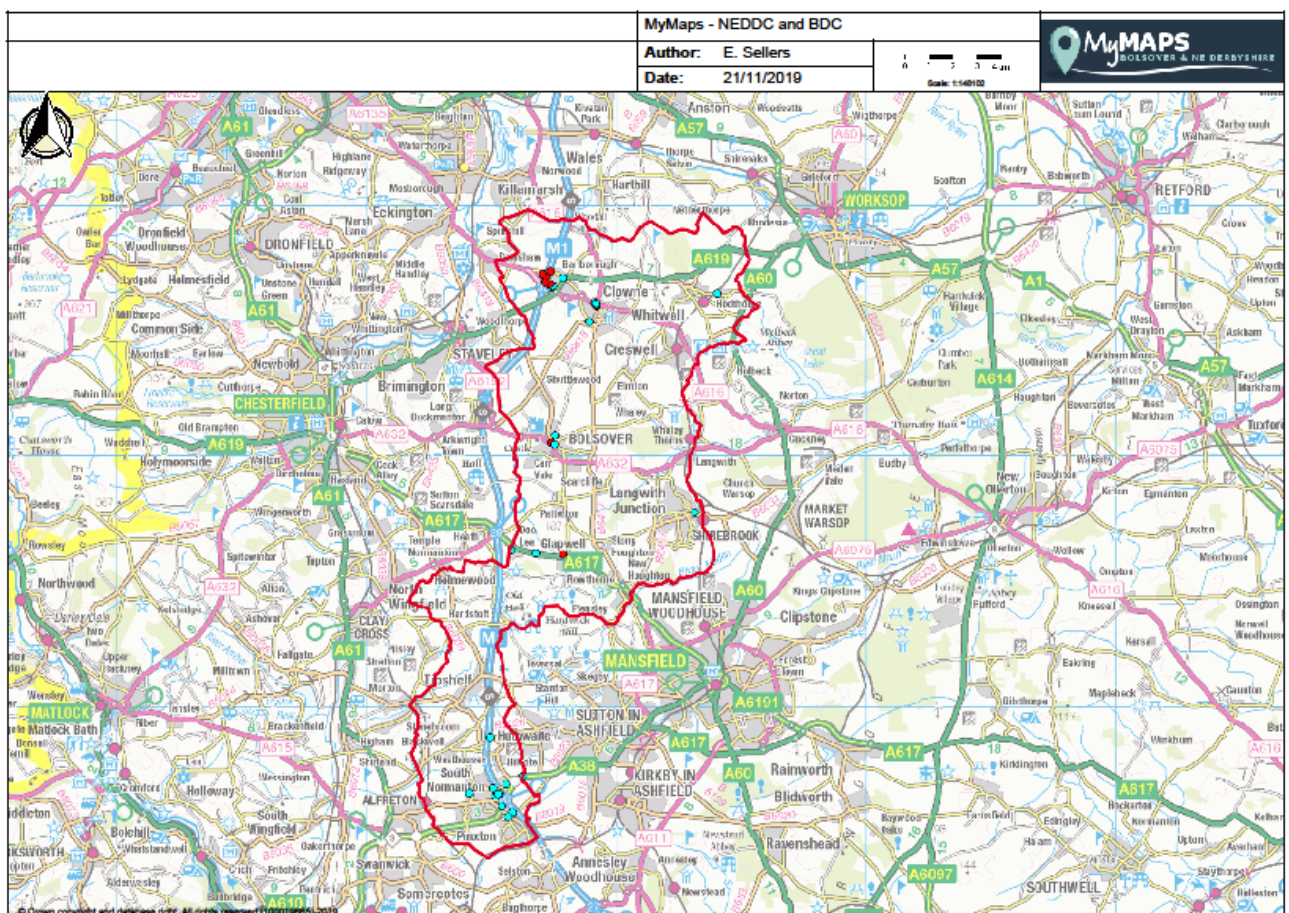
In addition to the extensive potential development in the Clowne area there are several other major residential and commercial developments either in the planning process or with planning approval. The air quality impact has been considered as part of the planning process although the cumulative impact of these developments remains to be seen.

The strategic alliance between Bolsover and North East Derbyshire District Councils enables each to benefit from broader experience and expertise in challenging the causes of poor air quality.

The key priorities for air quality in Bolsover include;

1. The continuation of the long-term air quality monitoring programme
2. Keeping the monitoring programme under annual review to ensure that the monitoring takes places in the most relevant locations
3. To tackle air quality issues at source wherever possible through the regulatory controls of emissions to air by industry through the Environmental Permitting Regime.
4. To prevent new polluting sources or residential receptors being placed in sensitive areas without adequate controls and abatement through the evaluations of planning applications and through the local plan.

Figure 1.5 Map of location of all Nitrogen Dioxide Monitoring Points both past and present.



Local Engagement and How to get involved

The Council engages with the public on matters relating to air quality through, for example, a number of site specific community liaison groups and, in the future, public information initiatives through the Derbyshire County and City Air Quality Working Group, of which we are a key participant (See Appendix F for Terms of Reference).

Further engagement takes place through normal communication channels with parish councils and by dialogue with local interest groups, elected members and interested individuals. It was the results of such interaction which informed the decision to undertake additional monitoring in the review of diffusion tube monitoring locations for the 2017 monitoring programme.

Air Quality is not “someone else’s problem”. All members of the community can play a part in improving air quality. .

Simple steps that we can all take include making short journeys on foot or by bicycle rather than by car or using public transport. Derbyshire County Council operates a number of schemes relating to travel plans and reducing journeys by cars.

As it is often traffic congestion that exacerbates poor air quality, avoiding using vehicles as busy times can be beneficial. Car sharing for journeys to work or for the school run can reduce the number of vehicles using busy roads and junctions.

Other measures that can be taken include

- Purchasing low emission vehicles and or hybrid vehicles as individuals.
- Fleet vehicles and transport companies could play a major role in the use of low emission vehicles.
- Upgrading boilers to the newest and most efficient gas condensing boilers with the lowers nitrogen dioxide and carbon dioxide emissions
- Installing renewable options such as solar panels or wind turbines (in appropriate locations).

Table of Contents

Derbyshire County Council; Endorsement from Director of Public Health	1
Executive Summary: Air Quality in Our Area	i
Air Quality in Bolsover	iii
Actions to Improve Air Quality	x
Conclusions and Priorities	xi
Local Engagement and How to get Involved	xiv
1 Local Air Quality Management	1
2 Actions to Improve Air Quality	2
2.1 Air Quality Management Areas	2
2.2 Progress and Impact of Measures to address Air Quality in Bolsover	5
2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	15
3 Air Quality Monitoring Data and Comparison with Air Quality	
Objectives and National Compliance	16
3.1 Summary of Monitoring Undertaken	16
3.1.1 Automatic Monitoring Sites	16
3.1.2 Non-Automatic Monitoring Sites	16
3.2 Individual Pollutants	16
3.2.1 Nitrogen Dioxide (NO ₂)	16
Appendix A: Monitoring Results	19
Appendix B: Full Monthly Diffusion Tube Results for 2018	23
Appendix C: Supporting Technical Information / Air Quality Monitoring	
Data QA/QC	25
Appendix D: Map(s) of Monitoring Locations and AQMAs	30
Appendix E: Terms of Reference of the Derbyshire County and City Air	
Quality Working Group -	43
Appendix F: Summary of Air Quality Objectives in England	46
Glossary of Terms	47
References	48

List of Tables

Table 2.1 – Declared Air Quality Management Areas.....	3
Table 2.2 – Progress on Measures to Improve Air Quality	9
Table 2.3 – PHOF PM _{2.5} Comparison	15
Table A.1 – Details of Non-Automatic Monitoring Sites	Error! Bookmark not defined.9
Table A.2 – Annual Mean NO ₂ Monitoring Results.....	21
Table B.1 – NO ₂ Monthly Diffusion Tube Results - 2018.....	23
Table C.1 – Laboratory summary performance for AIR NO ₂ PT Rounds.....	27
Table C.2 – Bias Adjustment Factor for Gradko International 2018.....	29
Table F.1 – Air Quality Objectives in England	27

List of Figures

Figure 1.1 – Maps of Bolsover District Council showing the main towns, villages, roads and railway lines	v
Figure 1.2 – Map of Air Quality Management Area – South Normanton.....	vi
Figure 1.2 – Map of Air Quality Management Area – Barlborough Number 1.....	vii
Figure 1.2 – Map of Air Quality Management Area – Barlborough Number 2.....	vii
Figure 1.5 – Maps of location of all Nitrogen Dioxide Monitoring Points both past and present.....	xii

1 Local Air Quality Management

This report provides an overview of air quality in Bolsover 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 Bolsover District 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 F.

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 Bolsover District Council can be found in Table 2.1.

Further information related to declared or revoked AQMAs are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=23 . See full list at <https://uk-air.defra.gov.uk/aqma/list>

Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides for a map of air quality monitoring locations in relation to the AQMA(s).

We have started the process to revoke Barlborough AQMA No 1 and Barlborough AQMA No 2.

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 if Exceedances (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan		
						At Declaration	Now	Name	Date Of Publication	Link
South Normanton AQMA	02-Jul-04	NO2 Annual Mean	South Normanton	The AQMA encompasses twelve properties and their gardens, 1-23 odd Carter Lane East, South Normanton on the east side of the M1 Motorway. The area extends 100m east of the main carriageway not the sliproad.	YES	49 µg/m ³	34.8 µg/m ³	AIR QUALITY ACTION PLAN FOR THE DISTRICT OF BOLSOVER AIR QUALITY MANAGEMENT AREA	2004	Available on request
Barlborough AQMA No 1	22-Aug-05	NO2 Annual Mean	Barlborough	A single property adjacent to the A619/616 roundabout in Barlborough	NO	43 µg/m ³	28.7 µg/m ³	AIR QUALITY ACTION PLAN FOR THE DISTRICT OF BOLSOVER AIR QUALITY MANAGEMENT AREA	N/A	Available on request
Barlborough AQMA No 2	19-Oct-07	NO2 Annual Mean	Barlborough	An area encompassing 5 residential dwellings on Orchard Close, Barlborough where the western property boundaries border the M1	YES	43 µg/m ³	27.1 µg/m ³	An area encompassing 5 residential dwellings on Orchard Close, Barlborough where the western property boundaries border the M1	N/A	Available on request

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

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2.2 Progress and Impact of Measures to address Air Quality in Bolsover District Council

Defra's appraisal of last year's ASR concluded that the next steps was for the Council to submit the 2019 Annual Status Report. The commentary attached to the DEFRA appraisal raised 6 issues as detailed below.

1. *It is unclear if annualisation corrections have been applied to sites with low capture rate. In future reports please provide discussion and example calculations of all corrections. For further guidance please refer to LAQM Technical Guidance 2016 (TG16).*

With regard to the Appraisers first point, this will be taken on board for future reports, however, there were no sites this year with a low capture rates so annualisation corrections were not applicable.

2. *The Councils decision to revoke Barlborough 1 & 2 AQMA is supported. The Council should follow the procedures set out in TG16, aiming to revoke these sites as soon as possible. For further guidance please refer to TG16.*

The Council has now started the process to revoke Barlborough 1 & 2 AQMAs.

3. *While the AQAP contains many measures there is little discussion as to their progress or barriers to implementation. In future reports the Council should use this report to reflect on progress, as it is meant to act as a progress log. From this charting progress will be easier. As such it is not immediately clear when the AQAP was last reviewed or updated.*

The Progress of Measures (Table 2.2) has been reviewed and updated and a full review of the remaining Air Quality Management Area's Action Plan for South Normanton is set for review next year.

4. *Further to the above there are a lack of objective KPIs, pollution reduction targets and dates for each measure. The Council should aim to include information within these brackets. Similarly this would help them determine the success of each measure and whether or not each measure is still fit for purpose.*

Please refer to the response above in relation to the Appraisers fourth comment.

- 5. A number of sites that are monitored passively have reported historically low concentrations. Although the Council expanded their network to include 6 additional sites in 2017 further review of the monitoring strategy is encouraged. Ideally these resources can be used to establish air quality levels in previously unmonitored location, with the aim of identifying hotspots and areas of concern.*

Although there were no changes in monitoring sites during 2018, the Council keeps this under review and there have been several changes to monitoring sites in 2019, of which the results will be communicated in next year's ASR.

- 6. The report lacks adequate discussion of PM_{2.5} emissions within the District. Future reports should have more reflection on local issues, especially relative to the Public Health Outcomes Framework.*

The Appraisers comments have been noted and more information has been included in relation to PM_{2.5} emissions in this report.

Bolsover District Council has taken forward a number of direct measures during the current reporting year of 2018 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.2.

In July 2017 the Government published a plan for reducing roadside nitrogen dioxide concentrations. The Plan sets out a number of national and local measures that need to be taken. The report identified 33 local authorities that had in their area an exceedance of the EU Ambient Air Quality Directive for nitrogen dioxide along a specific stretch of carriageway. Whilst technically this does not form part of the Council's duties under the Local Air Quality Management regime under the provisions of Part IV of the Environment Act 1995, it is nevertheless an air quality issue. It is predicted that the affected area would be compliant during 2020.

However, following a legal challenge of the Government's approach in the High Court, the Council was issued a Ministerial Direction that required it to undertake a feasibility study before 31st July 2018 to assess a range of possible initiatives to reduce the nitrogen dioxide concentration to below the 40 µg/m³ limit in the shortest possible time. The production and implementation of a Local NO₂ Plan in accordance with the Ministerial Direction is currently ongoing.

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

- Completion of the revocation of the two Barlborough AQMAs
- Completion of the Local Plan in compliance with the Ministerial Direction.

Bolsover District Council's priorities for the coming year are to complete revocation of the two Barlborough AQMAs and to complete the Local Plan.

The principal challenges and barriers to implementation that Bolsover District Council anticipates facing are having to divert resources from our "normal" air quality function to deal with the Ministerial Direction which is required to be delivered within a very tight timescale. The Ministerial Direction has, however, had the effect of having raised the profile of local air quality management both within the Council (particularly at a political and senior officer level) and with our partner organisations.

Bolsover District Council anticipates that the measures stated above and in Table 2.2 will achieve compliance in the South Normanton Air Quality Management Area as it is already below the Air Quality Objective.

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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	Comment / Barriers to implementation
1	Local Transport Plan Three	Transport Planning and Infrastructure	Other	Derbyshire County Council	Completed	Ongoing	Air Quality Objective	Reduced Vehicle Emissions	Ongoing	2026	Project plan for replacement Local Transport Plan 4 in place. This will set investment priorities for a period at least up to 2032.
2	The Councils LGV Refuse Fleet meet Euro 6 Standards	Promoting Low Emission Transport	Public Vehicle Procurement -Prioritising uptake of low emission vehicles	Bolsover District Council. Derbyshire County Council. Derby City Council.	Completed	Completed	Air Quality Objective	Reduced Vehicle Emissions	All Council LGV Refuse Fleet meet Euro 6 Standard	Completed	Forms part of the County's Low Emission Vehicle Infrastructure Strategy
3	'Smarter Travel' Initiatives - 'Miles Better'/Alternatives to travel/Grey fleet mileage/Core fleet/Cheaper and sustainable transport at work	Promoting Travel Alternatives	Workplace Travel Planning	Derbyshire County Council	Completed	Completed	Air Quality Objective	Reduced vehicle emissions	Ongoing	Ongoing	DCC staff travelling from/to Bolsover can take advantage of the Miles Better Staff Travel Campaign (Cycle2Work, discounted public transport tickets/care share etc. 11 new e-vehicles to be introduced to DCC pool fleet by March 2020 (8 Nissan Leafs and 3 e-bikes)
4	Sustainable Modes of Travel Strategy	Promoting Travel Alternatives	School Travel Plans	Derbyshire County Council	Completed	Completed	Air Quality Objective	Reduced Vehicle Emissions	Ongoing	Ongoing	All Derbyshire schools are able to take advantage of the Modeshift Stars programme. This encourages children and parents/staff to travel in a more active manner and includes and accreditation system (Bronze/Silver/Gold depending on the level of activity at individual schools).

Bolsover District Council

5	Smart Rider Cyclist Training	Promoting Travel Alternatives	Promotion of cycling	Derbyshire County Council	Completed	Completed	Air Quality Objective	Reduced Vehicle Emissions	Ongoing	Ongoing	DCC Road Safety Team deliver the Smart Rider Programmes to specific areas/schools
6	The Derbyshire Cycling Plan	Promoting Travel Alternatives	Promotion of cycling	Derbyshire County Council	Completed	Completed	Air Quality Objective	Reduced Vehicle Emissions	Ongoing	2030	The County's Key Cycle Network (an integral component of the DCP) due to go to cabinet in December 2020.
7	Use of Low Emission Vehicles	Promoting Low Emission Transport	Other	Derbyshire County Council	Ongoing	LEV Infrastructure Strategy due to approved by Cabinet in November 2019.	Air Quality Objective	Reduced Vehicle Emissions	Implementation Ongoing	Ongoing	Low Emission Vehicle Infrastructure Strategy due to be approved by Cabinet in November 2019. Implementation of action plan can then commence.
8	Go Ultra Low - Electric Vehicle Charging Network	Transport Planning and Infrastructure	Other	D2N2 - Derbyshire County Council / Nottinghamshire County Council	Ongoing	Ongoing	Air Quality Objective	Reduced Vehicle Emissions	11 x rapid units and 38 x destination (or fast) units committed for installation by March 2020 across a number of Derbyshire market towns. Includes one rapid unit in Bolsover	2020	
9	Working with owner/occupiers to switch to funded high efficiency gas condensing boilers	Promoting Low Emission Plant	Shift to installations using low emission fuels for stationary and mobile sources	BDC/DCC/ECO	Ongoing	Ongoing	Air Quality Objective	Reduction in nitrogen dioxide, sulphur dioxide and particulates	61 Units installed in BDC	Ongoing	
10	Identifying vulnerable households (all tenures) and encouraging funded/part funded energy efficiency measures	Promoting Low Emission Plant	Shift to installations using low emission fuels for stationary and mobile sources	BDC	Ongoing	Ongoing	Air Quality Objective	Reduction in nitrogen dioxide, sulphur dioxide and particulates	103 CW/Loft and heating control upgrade installations in BDC	Ongoing	

Bolsover District Council


11	Proactively engaging with all of community to educate / encourage people to use heating system most effectively	Public Information	Via other mechanisms	BDC/DCC	Ongoing	Ongoing	Air Quality Objective	Reduction in nitrogen dioxide, sulphur dioxide and particulates	280 face to face Bolsover	Ongoing	
12	East Midlands Air Quality Network - (Derbyshire Air Quality Working Group)	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	BDC / Derbyshire County Council / Public Health England / Derby City Council	Completed	Completed	N/A	Reduction in a range of pollutants	Work Plans / Action Plans Developed	Ongoing	Air Quality Working Group involves key players at senior level in public sector and voluntary sectors
13	Supporting / encouraging Homeworking	Promoting Travel Alternatives	Encourage / Facilitate home-working	BDC/Derbyshire County Council	Ongoing	Ongoing	Air Quality Objective	Reduced vehicle emissions	Ongoing	Ongoing	Reduction in vehicles in use, especially at busy times of the day
14	Publication Draft Local Plan (as submitted August 2018) Policy SC12: Air Quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	BDC	Examination	Ongoing	Air Quality Objective	N/A	Implementation on-going	Implementation on-going	Consideration of impact of new development on Air Quality
15	Publication Draft Local Plan (as submitted August 2018) Policy SC12: Air Quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	BDC	Examination	Ongoing	Air Quality Objective	Reduced vehicle emissions	Implementation on-going	Implementation on-going	Promotion of alternative / sustainable transport to improve air quality
16	Development of Supplementary planning guidance re Air Quality via East Midlands Air Quality Network - (Derbyshire Air Quality Working Group)	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	BDC / Derbyshire County Council / Public Health England / Derby City Council	Ongoing	Ongoing	N/A	Reduction in a range of pollutants	Implementation on-going	Implementation on-going	To be taken to the Planning and Health Group on completion for discussion and local adoption and implementation

17	East Midlands Air Quality Network (Derbyshire Air Quality Working Group) working with planning to ensure inclusion of air quality in the DCC Strategic Planning Framework as well as in NED Local Plan.	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	NEDDC / Derbyshire County Council / Public Health England / Derby City Council	Ongoing	Ongoing	N/A	Reduction in a range of pollutants	Implementation on-going	Implementation on-going	To be taken to the Planning and Health Group on completion for discussion and local adoption and implementation
18	East Midlands Air Quality Network (Derbyshire Air Quality Working Group) also developing guidance for neighbourhoods to support inclusion of air quality mitigation within neighbourhood plans.	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	NEDDC / Derbyshire County Council / Public Health England / Derby City Council	Ongoing	Ongoing	N/A	Reduction in a range of pollutants	Implementation on-going	Implementation on-going	To be taken to the Planning and Health Group on completion for discussion and local adoption and implementation
19	Travel Plans required as planning conditions for larger developments. Supported by Publication Draft Local Plan (as submitted August 2018) Policies SC12: Air Quality & ITCR10: Supporting Sustainable Transport Patterns.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	BDC	Ongoing	Ongoing	N/A	Reduced vehicle emissions	6 Travel Plans in 2018	Implementation on-going	Travel plans required as part of planning controls for larger developments

20	Urban design and development control Promotion of Walking. Supported by Publication Draft Local Plan (as submitted August 2018) Policy ITCR10: Supporting Sustainable Transport Patterns.	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	BDC	Ongoing	Supplementary Planning document - Guide to Sustainable Housing Layout and Design for Bassetlaw DC, Bolsover DC, NEDDC and Chesterfield BC (2013)	Air Quality Objective	Reduced vehicle emissions, improved connectivity between developments and sustainable, integrated developments	Implementation on-going. SPD to be updated to reflect NPPF and recent changes and ensure consistency with new National Design Guidance 2019	Implementation on-going	Lack of central government policy support at present. Local Highways Authority policy to adoption and maintenance.
21	Corporate Aim H 15 Reduction of energy use in sheltered housing scheme	Promoting Low Emission Plant	Low Emission Fuels for stationary and mobile sources in Public Procurement	BDC	2016	2016-2019	Air Quality Objective	Reduction in particulates, sulphur dioxide and nitrogen dioxide	Nearly almost all Commercial District Heating Systems Replaced with Modern Individual Combi Boilers	2019	
22	Corporate Aim H 16 Replace each year 200 gas fired back boilers in Council houses with more efficient "A" rated combi-boilers	Promoting Low Emission Plant	Public Procurement of stationary combustion sources	BDC	2016	2016-2019	Air Quality Objective	Reduction in nitrogen dioxide and other products of combustion	end of 2016 - 234 boilers fitted	2019	
23	New Bolsover Model Village Transformation	Promoting Low Emission Plant	Public Procurement of stationary combustion sources	BDC	2016	2016-2019	Air Quality Objective	Reduction in nitrogen dioxide and other products of combustion	133 Boilers Replaced	Completed	
24	New Bolsover Model Village Transformation	Other	Other	BDC	2016	2016-2019	N/A	N/A	138 BDC Properties and 2 Private Dwellings Insulated	Completed	
25	Large funded multiple gas connection and modern high efficiency boiler schemes to old communally heated local authority housing stock	Promoting Low Emission Plant	Shift to installations using low emission fuels for stationary and mobile sources	BDC	Ongoing	Ongoing	Air Quality Objective	Reduction in nitrogen dioxide, sulphur dioxide and particulates	131 funded BDC connections	Ongoing	

26	Regulation of low emission fuels 100% coverage of Smoke Control Areas	Promoting Low Emission Plant	Regulations for fuel quality for low emission fuels for stationary and mobile sources	BDC	Completed	Completed	Air Quality Objective	Smoke and sulphur dioxide emissions reduced through Clean Air Act Regulations	Implemented and Enforcement as necessary	Implementation completed and education/enforcement ongoing	Smoke Control Areas in former mining area with high use of solid fuels
27	Making reports on Air Quality available to public	Public Information	Via the Internet	BDC	Ongoing	Ongoing	Air Quality Objective	Reduction in a range of pollutants	Implementation on-going	Ongoing	Raise awareness on actions individuals can take
28	Data and resource provided to support Chief Regulators to provide trend monitoring to Health Protection Board (sub group of Health and Wellbeing Board)	Public Information	Via other mechanisms	NEDDC	Ongoing	Ongoing	Public Information	N/A	Annual Reports	Ongoing	Raise awareness

 Measures Recently Completed

 Measure Data

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.

Bolsover District Council is taking measures as detailed in Table 2.2 above, most of which will contribute to address the PM_{2.5} issues, especially those which reduce the emissions from products of combustion and the designation of Smoke Control Areas.

Bolsover District Council has also partnered with other Councils across Derbyshire and Public Health England and formed the Derbyshire County and City Air Quality Working Group. The group will focus on particulates and nitrogen oxides and to make air quality a priority for Local Health and Wellbeing Boards.

The Public Health Outcomes Framework (PHOF) is a Department of Health tool which uses indicators to assess improvements to health. The PHOF has an indicator which relates to fine particulate matter (PM_{2.5}).

Based on the latest figures available Bolsover District Council can be compared to the rest of England. The data is summarised in Table 2.3 below.

England Average	England Lowest	England Highest	East Midlands Average	Derbyshire Average	Bolsover Average
5.1	2.9	7	5.1	4.5	4.6

Information accessed September 2019

Available from <https://fingertips.phe.org.uk/profile/public-health-outcomes-framework>

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

Bolsover District Council no longer operates an automatic (continuous) monitoring site and now relies solely on a network of passive diffusion tubes for monitoring nitrogen dioxide pollution.

3.1.2 Non-Automatic Monitoring Sites

Bolsover District Council undertook non- automatic (passive) monitoring of NO₂ at 34 sites during 2018. Two of these sites have triplicate tube exposure as part of the quality procedure to demonstrate reproducibility of monitoring data. 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. 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.

The full 2018 dataset of monthly mean values is provided in Appendix B at Table B.1

It has been shown that where the annual mean nitrogen dioxide concentration is less than 60µg/m³ it is **most unlikely** that the air quality objective for the hourly mean concentration (200µg/m³, not to be exceeded more than 18 times per year) will be exceeded.

It is seen from the diffusion tube monitoring that there are no annual mean nitrogen dioxide concentrations close to $60\mu\text{g}/\text{m}^3$.

Table A.2 at Appendix A shows the trend in annual mean nitrogen dioxide concentration for all diffusion tube monitoring sites over the 5-year period 2014 to 2018. This shows that there have been no exceedances of the annual mean air quality objective for nitrogen dioxide at any of the monitoring locations since 2014.

Previous ASRs have commented on the potential effects of the conversion of the M1 motorway to a 4 lane smart motorway on the Air Quality Management Areas. It was looking as if it may have been appropriate to revoke all three AQMAs due to a decline of the annual mean nitrogen dioxide concentrations. The decision was not taken, however, until we had evaluated the effect of the conversion of the principal emission source (The M1 motorway) to a smart motorway and to ensure the reductions in pollutant concentration was due to speed limit restrictions and lane closures throughout the carriageway improvements. The Council commissioned Bureau Veritas to undertake a review of monitoring data and make recommendations on the revocation of the AQMAs. This work was completed after the full 2017 data set was available i.e. a full calendar year following the opening of the smart motorway. The Bureau Veritas report is shown at Appendix E.

It was concluded that the annual mean nitrogen dioxide concentration in the two Barlborough AQMAs remained sufficiently below the Air Quality Objective such that they should be revoked. However, there had been a slight increase in the annual mean nitrogen dioxide concentration in the South Normanton AQMA in 2017 that, whilst it was still marginally below the Air Quality Objective at $39.8\mu\text{g}/\text{m}^3$, we could not be confident that it would remain as such. Although the nitrogen dioxide concentration decreased in 2018 to $34.8\mu\text{g}/\text{m}^3$, the South Normanton AQMA is still in place for the time being until such time that we are confident that it can be safely revoked.

There had been a steady reduction each year in the Barlborough AQMAs and the Council was reasonably confident that the reduction was not due to temporary lane closures and speed limits on the Motorway, therefore the procedure for revoking the existing AQMAs has commenced.

As part of the review of the monitoring locations at the end of 2015, a new site was established at the junction of Barlborough Rd / Creswell Rd / Rotherham Road and

North Street, Clowne. This is a traffic light controlled junction and is known to have frequent queues of traffic at busy periods. There are also dwellings in very close proximity to the carriageway. The annual mean nitrogen dioxide concentration for 2016 at the newly created site (Tube Ref 30) was found to be $39.2\mu\text{g}/\text{m}^3$, which is extremely close to the $40\mu\text{g}/\text{m}^3$ Air Quality Objective. Therefore, additional monitoring locations were set up at other dwellings around the junction to determine whether any further action was required. It has been found that all seven locations had annual mean nitrogen dioxide concentrations below the Air Quality Objective. The tube location which had previously had a concentration of $39.2\mu\text{g}/\text{m}^3$ had fallen to $35.6\mu\text{g}/\text{m}^3$ in 2017, but has since increased to $37.9\mu\text{g}/\text{m}^3$ in 2018. As there are a number of proposed housing developments in the Clowne area it has been decided to retain these monitoring locations to assess the impact on air quality at this busy junction.

Appendix A: Monitoring Results

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	11 Town End, Bolsover	Roadside	447502	370445	NO2	NO	N/A	4	NO	2.5
2	25 Orchard Close, Barlborough	Suburban	447174	377246	NO2	YES	0	34.3	NO	2.5
3	Thomas College House, Bolsover	Urban Background	447515	370818	NO2	NO	12	36	NO	2.5
4	27 West Street, Doe Lea	Urban Background	445777	366254	NO2	NO	7.9	123	NO	2.5
5	1 Carter Lane East, South Normanton	Roadside	445241	356541	NO2	YES	0	12.8	NO	2.5
26	1 Carter Lane East, South Normanton	Roadside	445241	356536	NO2	YES	0	12.8	NO	2.5
27	1 Carter Lane East, South Normanton	Roadside	445241	356536	NO2	YES	0	12.8	NO	2.5
6	29 Brookhill Lane, Pinxton	Roadside	445828	355805	NO2	NO	12	1.5	NO	2.5
8	2 Paddocks Close, Pinxton	Urban Background	445394	356045	NO2	NO	0	42.8	NO	2.5
9	Queens Close, Hodthorpe	Urban Background	454017	376464	NO2	NO	15.2	48.1	NO	2.5
10	57 Carter Lane West, South Normanton	Roadside	445140	356458	NO2	NO	22.1	22.7	NO	2.5
11	16 Chesterfield Rd, Barlborough	Suburban	447380	376706	NO2	NO	0	18.3	NO	2.5
12	2A Westbridge Rd, Barlborough	Suburban	447174	377157	NO2	NO	0	13.2	NO	2.5
14	14 Chesterfield Rd, Barlborough	Roadside	447427	376756	NO2	YES	0	8.7	NO	2.5
23	14 Chesterfield Rd, Barlborough	Roadside	447427	376756	NO2	YES	0	8.7	NO	2.5
24	14 Chesterfield Rd, Barlborough	Roadside	447427	376756	NO2	YES	0	8.7	NO	2.5

15	3 Carter Lane East South Normanton	Roadside	445245	356539	NO2	YES	0	17.4	NO	2.5
16	Woodland Grove, Barlborough	Suburban	447323	376847	NO2	NO	4	45.5	NO	2.5
17	36 Bowdon Avenue, Barlborough	Suburban	447133	376900	NO2	NO	0	38.3	NO	2.5
18	Sheffield Road, Barlborough	Suburban	447022	377227	NO2	NO	16.4	1.5	NO	2.5
19	California Lane, Barlborough	Suburban	447344	377343	NO2	NO	3	18.5	NO	2.5
20	o/s 17 Carter Lane East, South Normanton	Roadside	445278	356540	NO2	YES	7	46.2	NO	2.5
21	31 Carter Lane East, South Normanton	Suburban	445321	356567	NO2	NO	0	87.6	NO	2.5
22	37 Berristow Place, South Normanton	Suburban	446245	357257	NO2	NO	0	10.35	NO	2.5
25	o/s Travellers Site, Blackwell	Suburban	444935	358793	NO2	NO	26.7	3	NO	2.5
28	2 The Hill Glapwell	Roadside	446753	366127	NO2	NO	0	4	NO	2.5
29	198 The Hill, Glapwell	Roadside	447848	366083	NO2	NO	0	5.6	NO	2.5
30	4A Barlborough Rd, Clowne	Roadside	449133	376061	NO2	NO	0	1	NO	2.5
31	9 Barlborough Rd, Clowne	Roadside	449120	376040	NO2	NO	0	3.3	NO	2.5
32	28 Barlborough Rd, Clowne	Roadside	449093	376087	NO2	NO	0	1.3	NO	2.5
33	97 North Rd Clowne	Roadside	449187	375957	NO2	NO	0	2.3	NO	2.5
34	128 North Rd Clowne	Roadside	449185	376012	NO2	NO	0	2.3	NO	2.5
35	5 Rotherham Rd Clowne	Roadside	449121	376107	NO2	NO	0	3.4	NO	2.5
36	Junction of Rotherham Rd/Creswell Rd, Clowne	Roadside	449166	376056	NO2	NO	0	3.4	NO	2.5

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 – Annual Mean NO₂ 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 (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
1	Roadside	Diffusion Tube		100.0					27.0
1	Roadside	Diffusion Tube		100.0	31.6	25	31.7	28.7	Discontinued
2	Suburban	Diffusion Tube		100.0	29.4	30.2	30.8	29.8	28.7
3	Urban Background	Diffusion Tube		100.0	14.1	12.8	13.1	13.1	13.3
4	Urban Background	Diffusion Tube		91.7	19.3	17.7	18.6	17.9	18.1
5	Roadside	Diffusion Tube		100.0	37	37.6	35.8	37.1	33.2
26	Roadside	Diffusion Tube		100.0	37.9	36.7	36.0	37.5	33.7
27	Roadside	Diffusion Tube		100.0	37.9	36.8	36.3	37.2	34.7
6	Roadside	Diffusion Tube		100.0	33	27.6	30.9	28.5	32.8
8	Urban Background	Diffusion Tube		100.0	29	25.8	29.7	24.3	26.9
9	Urban Background	Diffusion Tube		83.3	14.3	12.5	13.6	12.9	14.4
10	Roadside	Diffusion Tube		100.0	30.6	25.9	29.1	24.2	27.6
11	Suburban	Diffusion Tube		100.0	25.5	26.1	25.9	24.1	25.5
12	Suburban	Diffusion Tube		100.0	29.5	28.6	30.5	28.1	27.8
14	Roadside	Diffusion Tube		100.0	28	28.2	28.0	27.1	26.6
23	Roadside	Diffusion Tube		100.0	28.2	29.3	28.9	29.1	27.1
24	Roadside	Diffusion Tube		100.0	29.3	30.1	28.6	29.1	27.5
15	Roadside	Diffusion Tube		100.0	36.9	37.6	36.0	39.8	34.8
16	Suburban	Diffusion Tube		100.0	26.1	26.2	26.9	25.9	25.3

17	Suburban	Diffusion Tube		100.0	27.8	28.1	27.8	27.7	26.9
18	Suburban	Diffusion Tube		83.3	26.2	22.1	24.7	22.1	23.2
19	Suburban	Diffusion Tube		100.0	20.9	20.6	21.9	19.9	20.3
20	Roadside	Diffusion Tube		100.0	36.2	36	35.5	36.0	33.8
21	Suburban	Diffusion Tube		91.7	29.8	26.2	28.3	27.5	26.6
22	Suburban	Diffusion Tube		83.3	28	26.3	26.4	26.0	27.4
25	Suburban	Diffusion Tube		100.0	30.6	29.8	32.3	29.9	29.4
28	Roadside	Diffusion Tube		100.0			26.7	20.5	19.3
29	Roadside	Diffusion Tube		100.0			20.1	19.9	20.5
30	Roadside	Diffusion Tube		100.0			39.2	35.6	37.9
31	Roadside	Diffusion Tube		100.0				32.0	26.9
32	Roadside	Diffusion Tube		91.7				31.6	31.7
33	Roadside	Diffusion Tube		91.7				31.1	31.2
34	Roadside	Diffusion Tube		100.0				31.5	29.3
35	Roadside	Diffusion Tube		91.7				21.0	18.4
36	Roadside	Diffusion Tube		100.0				31.2	29.2

Diffusion tube data has been bias corrected

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) 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 2018

Table B.1 – NO₂ Monthly Diffusion Tube Results – 2018

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.92) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
1	37.79	26.80	35.77	26.28	24.60	21.21	24.69	26.26	28.72	29.96	33.31	36.46	29.32	26.97	
2	36.13	29.61	30.03	27.68	27.92	23.72	27.61	35.48	38.23	37.34	25.30	35.37	31.20	28.71	
3	18.50	17.31	15.64	12.19	11.31	9.07	10.10	11.48	12.18	14.72	21.44	20.13	14.51	13.35	
4	24.96	20.41	16.71	17.74		13.37	15.87	17.74	20.87	22.28	24.23	22.83	19.73	18.15	
5	39.63	33.91	40.33	35.78	29.33	25.86	32.38	43.11	40.96	36.17	33.55	41.87	36.07	33.19	
26	36.99	33.17	41.12	37.40	29.23	25.18	38.25	40.06	37.07	40.36	39.61	41.30	36.64	33.71	
27	41.42	34.88	44.46	37.43	29.80	27.60	36.23	43.74	38.11	41.53	37.81	39.53	37.71	34.70	
6	33.46	37.57	38.59	34.39	44.32	42.00	31.56	29.92	26.43	37.60	35.55	36.11	35.62	32.77	
8	28.71	32.14	35.68	27.05	32.32	34.01	25.40	24.83	24.51	28.89	29.65	28.26	29.29	26.94	
9	20.25	14.81	16.52	13.07			11.67	8.32	14.51	17.31	22.23	18.14	15.68	14.43	
10	31.18	33.55	30.16	27.97	39.68	35.17	25.23	20.98	21.50	27.36	38.80	28.35	29.99	27.59	
11	32.21	28.12	32.34	21.77	30.32	24.63	25.03	23.40	25.35	26.75	30.16	33.09	27.76	25.54	
12	33.16	29.47	34.68	25.80	26.72	20.95	27.59	30.46	31.17	35.80	31.76	35.03	30.22	27.80	

14	31.23	26.57	34.13	27.04	25.03	21.04	27.86	28.75	29.75	30.13	34.67	30.53	28.89	26.58	
23	31.94	27.94	32.53	28.41	25.45	21.00	25.89	29.06	28.99	34.70	33.89	34.29	29.51	27.15	
24	33.04	28.12	33.65	25.94	24.63	21.76	29.82	30.03	32.49	32.72	31.14	35.47	29.90	27.51	
15	45.94	33.67	37.27	39.45	30.99	27.05	39.28	42.61	38.05	39.38	41.34	38.98	37.83	34.81	
16	33.66	28.71	29.01	26.58	22.53	19.44	22.43	24.59	29.08	29.98	32.65	31.51	27.51	25.31	
17	36.10	27.49	33.05	26.47	22.98	18.77	25.85	30.10	31.09	33.07	31.66	34.76	29.28	26.94	
18	30.10	30.74	31.44	13.22		18.55	21.07	19.48		26.91	34.05	26.72	25.23	23.21	
19	28.00	19.82	27.87	19.53	17.07	13.89	16.07	19.74	21.73	27.37	24.32	29.31	22.06	20.30	
20	40.26	34.76	35.41	33.76	25.81	28.63	39.24	39.88	41.78	42.96	38.75	40.26	36.79	33.85	
21	28.42	29.34	32.95		24.15	20.96	25.91	31.05	26.34	32.64	31.47	34.77	28.91	26.60	
22	35.30	27.19	31.05	26.22		20.92	28.35	31.24	31.11		32.18	33.75	29.73	27.35	
25	35.49	31.03	32.80	27.35	28.06	24.18	30.36	32.13	32.20	36.32	34.28	39.12	31.94	29.39	
28	25.16	21.75	16.70	21.52	19.85	18.06	18.96	18.10	19.54	23.49	23.59	24.91	20.97	19.29	
29	29.72	21.53	27.29	22.70	17.59	13.80	21.17	19.34	20.85	21.72	23.06	29.24	22.33	20.55	
30	41.47	39.17	49.19	44.83	35.80	41.92	39.61	35.10	37.45	43.27	43.17	43.41	41.20	37.90	
31	30.04	29.14	36.53	30.05	29.67	26.56	29.78	26.60	24.72	29.03	30.10	28.77	29.25	26.91	
32		34.57	39.71	32.54	41.56	37.06	32.49	27.18	26.97	34.53	36.74	36.02	34.49	31.73	
33	32.34	34.16	35.08	37.75	33.28	23.96	33.25	35.42	32.96	36.69	38.29		33.93	31.21	
34	22.40	35.34	37.82	34.75	37.01	33.62	31.46	24.96	24.94	28.99	38.54	31.76	31.80	29.25	
35		22.51	24.64	19.98	16.69	13.75	16.01	16.85	18.52	21.80	23.00	25.90	19.97	18.37	
36	27.08	30.02	37.64	34.11	39.91	32.14	27.30	26.55	27.43	31.31	34.09	32.84	31.70	29.16	

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 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. *(No distance corrections are required in accordance with the Statutory Guidance as the only annual mean concentrations above 36µg/m³ (Tube 30) is located at a relevant exposure).*

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

Diffusion Tube Monitoring

Diffusion tubes are used to provide a relatively simple and cost effective method of monitoring for nitrogen dioxide at several locations where nitrogen dioxide levels are likely to be high identified in previous reviews and assessments, due to the proximity of significant sources (normally traffic).

The tube is a small plastic device, approximately 6 centimetres long, open at one end, with a disc at the other end that reacts to nitrogen dioxide. They are located at sites, typically on lamp posts or other street furniture or on the facades of properties and exposed for a 4–5 week period, in line with the UK national survey.

The tubes contain a mesh which is doped with 50% v/v triethanolamine (TEA) in Acetone are fitted with a cap before and after exposure which is undertaken according to the national monthly schedule.

QA/QC Details of the Nitrogen Dioxide Diffusion Tube Survey

Although the Council does not carry out any collocation studies alongside an automatic monitor, it does expose tubes in triplicate at one of the locations (Sites ref 5, 26 and 27 and 14, 23 and 24) to demonstrate the reproducibility/reliability of the data. For 2018 the data shows good reproducibility, the annual mean concentrations being 33.2, 33.7 and 34.7 $\mu\text{g}/\text{m}^3$ for tubes 5, 26 and 27 respectively and 26.6, 27.1 and 27.5 $\mu\text{g}/\text{m}^3$ for tubes 14, 23 and 24 respectively.

AIR PT Scheme

The diffusion tubes are supplied and analysed by Gradko International, which participates in the Air PT laboratory inter-comparison scheme for the analysis the diffusion tubes.

AIR is an independent analytical proficiency-testing (PT) scheme, operated by LGC Standards and supported by the Health and Safety Laboratory (HSL). AIR PT is a new scheme, started in April 2014, which combines two long running PT schemes: LGC Standards STACKS PT scheme and HSL WASP PT scheme.

The laboratory has consistently scored 100% for the period covered by this report apart from AR030 which scored 75%.

The AIR PT Scores for the relevant period is shown in Table C.1

Table C.1 Laboratory summary performance for AIR NO2 PT rounds AR019 to AR030

The following table lists those UK laboratories undertaking LAQM activities that have participated in recent AIR NO2 PT rounds and the percentage (%) of results submitted which were subsequently determined to be satisfactory based upon a z-score of $\leq \pm 2$ as defined above

AIR PT Round	AIR PT AR019	AIR PT AR021	AIR PT AR022	AIR PT AR024	AIR PT AR025	AIR PT AR027	AIR PT AR028	AIR PT AR030
Round conducted in the period	April – May 2017	July – August 2017	September – October 2017	January – February 2018	April – May 2018	July – August 2018	September – October 2018	January – February 2019
Gradko International [1]	100 %	100 %	100 %	100 %	100%	100%	100%	75%

[1] Participant subscribed to two sets of test samples (2 x 4 test samples) in each AIR PT round.

Source <https://laqm.defra.gov.uk/assets/laqmno2performancedatauptofebruary2019v1.pdf>

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Bias Adjustment Factor

It is known that there are systematic differences in the performance of different laboratories and preparation methods of diffusion tubes. Table C.2 shows the studies that have been used to compare results from diffusion tubes (analysed by Gradko International) to results of co-located automatic chemiluminescence monitors, where data has been collected for 9 months or more.

From these studies it can be seen that the bias adjustment factor (A) of 0.92 has therefore to be applied (multiplied) to the diffusion tube results for 2018 data.

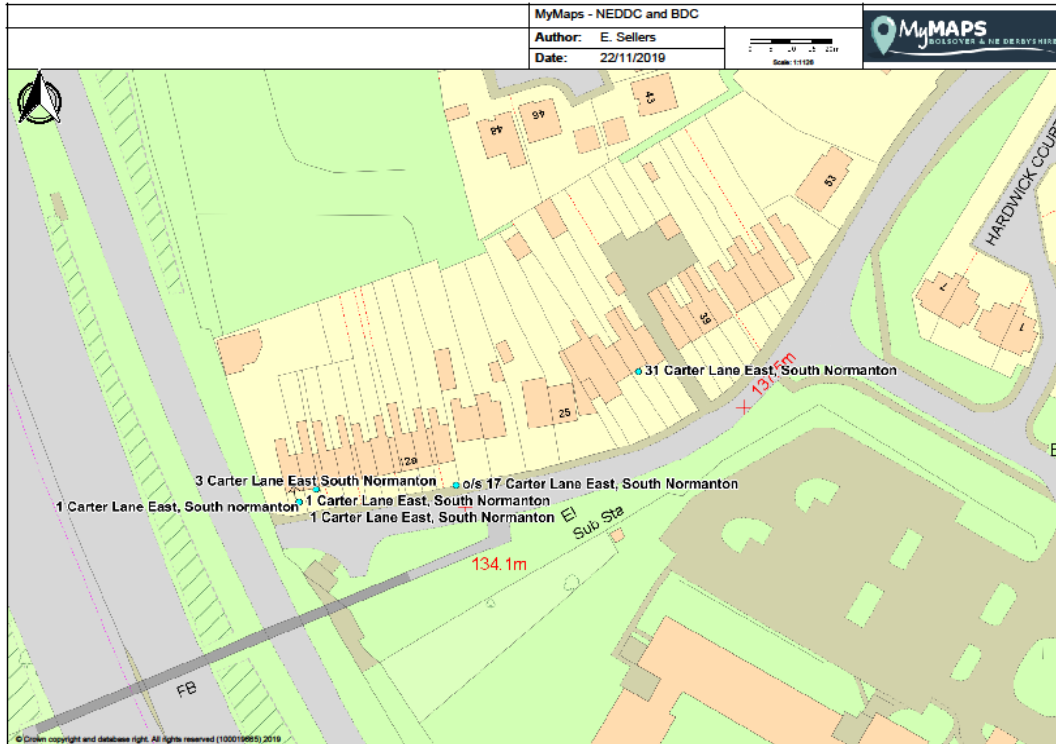
Table C.2 Bias Adjustment Factors for Gradko 2018

National Diffusion Tube Bias Adjustment Factor Spreadsheet							Spreadsheet Version Number: 03/19				
Follow the steps below in the correct order to show the results of relevant co-location studies							This spreadsheet will be updated at the end of June 2019 LAQM Helpdesk Website				
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods							Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet				
This spreadsheet will be updated every few months; the factors may therefore be subject to change. This should not discourage their immediate use.							The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.				
The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.							Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.				
Step 1:		Step 2:		Step 3:		Step 4:					
Select the Laboratory that Analyses Your Tubes from the Drop-Down List		Select a Preparation Method from the Drop-Down List		Select a Year from the Drop-Down List		Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor ³ shown in blue at the foot of the final column.					
If a laboratory is not chosen, we have no data for this laboratory.		If a preparation method is not chosen, we have no data for this method at this laboratory.		If a year is not chosen, we have no data.		If you have your own co-location study then see footnote ⁴ . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953					
Analysed By ¹	Method ²	Year ³	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m ³)	Automatic Monitor Mean Conc. (Cm) (µg/m ³)	Bias (B)	Tube Precision ⁵	Bias Adjustment Factor (A) (Cm/Dm)	
Gradko	50% TEA in acetone	2018	R	City of London	12	84	94	-10.7%	G	1.12	
Gradko	50% TEA in acetone	2018	B	City of London	10	38	32	20.3%	G	0.83	
Gradko	50% TEA in acetone	2018	R	RBWM	12	39	36	7.8%	G	0.93	
Gradko	50% TEA in acetone	2018	R	RBWM	12	35	34	2.2%	G	0.98	
Gradko	50% TEA in acetone	2018	SU	Redcar and Cleveland Borough Council	9	18	10	83.3%	G	0.55	
Gradko	50% TEA in acetone	2018	R	West Berkshire	10	40	37	10.5%	G	0.91	
Gradko	50% TEA in acetone	2018	KS	Marleybone Road Intercomparison	11	91	85	6.5%	G	0.94	
Gradko	50% TEA in acetone	2018	UB	Reading Borough Council	12	20	26	-22.6%	G	1.29	
Gradko	50% TEA in acetone	2018	Overall Factor³ (8 studies)						Use	0.92	

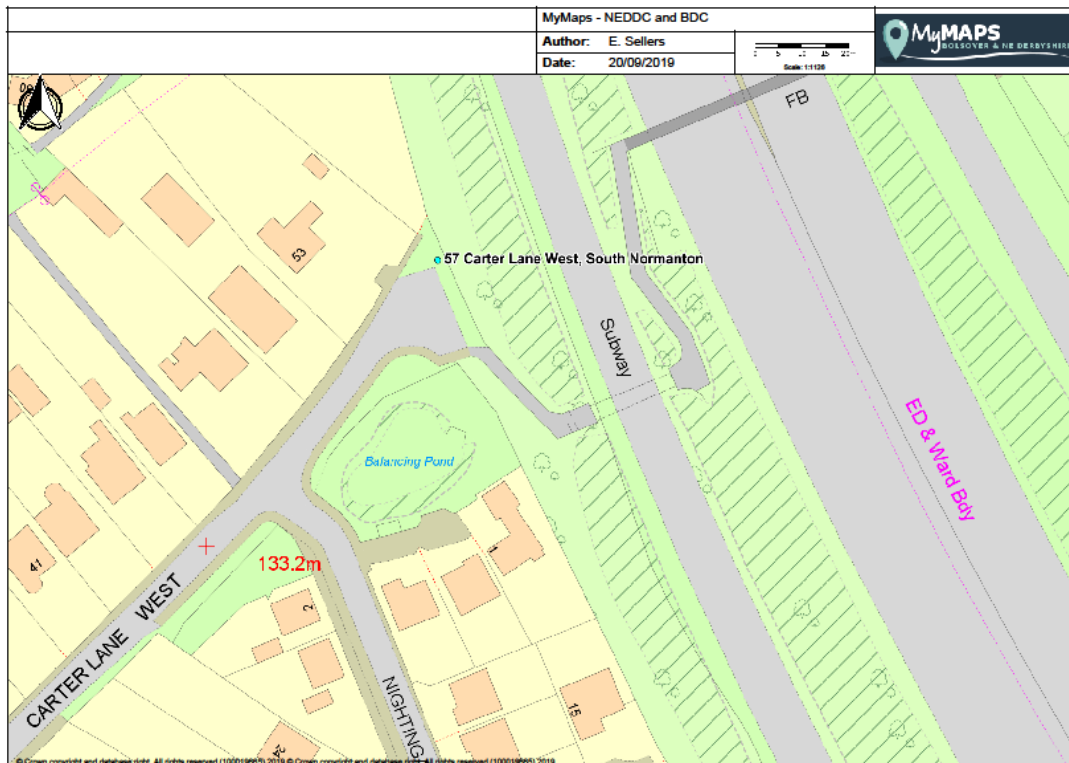
The diffusion tube bias adjustment factor for Gradko for 2018 is 0.92, being based on 8 studies. All diffusion tube data in this report for 2018 has been corrected for laboratory bias using this correction factor.

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

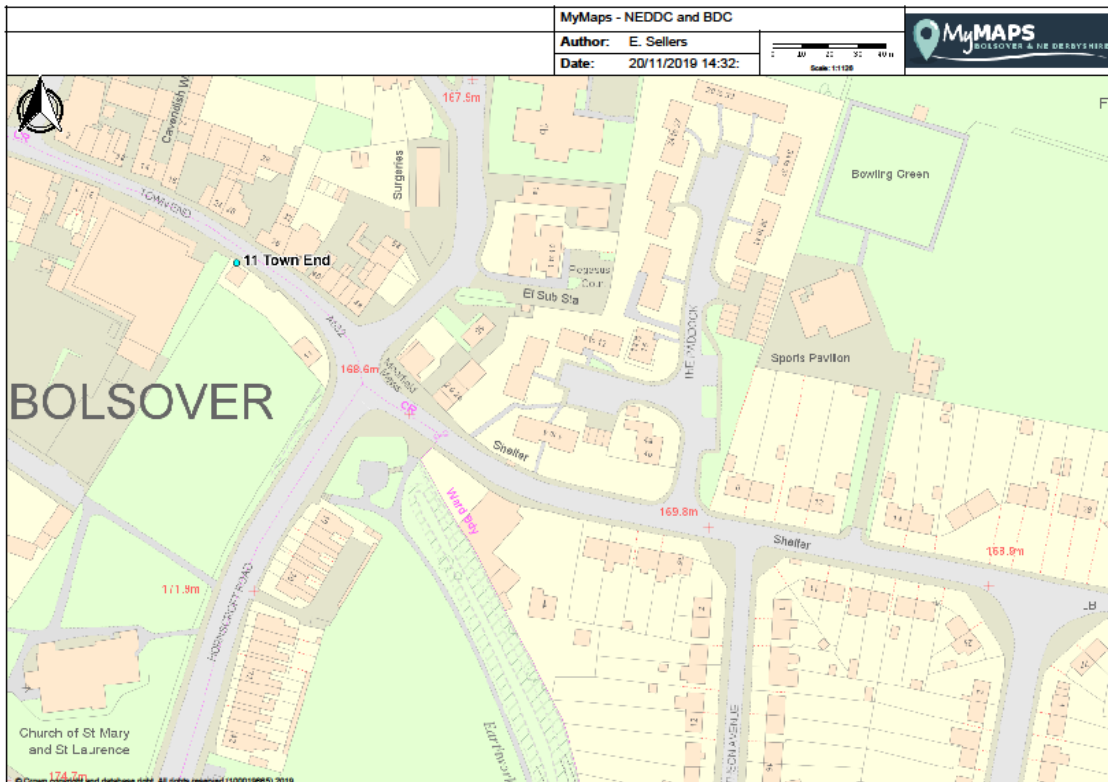
Diffusion Tube Monitoring Locations



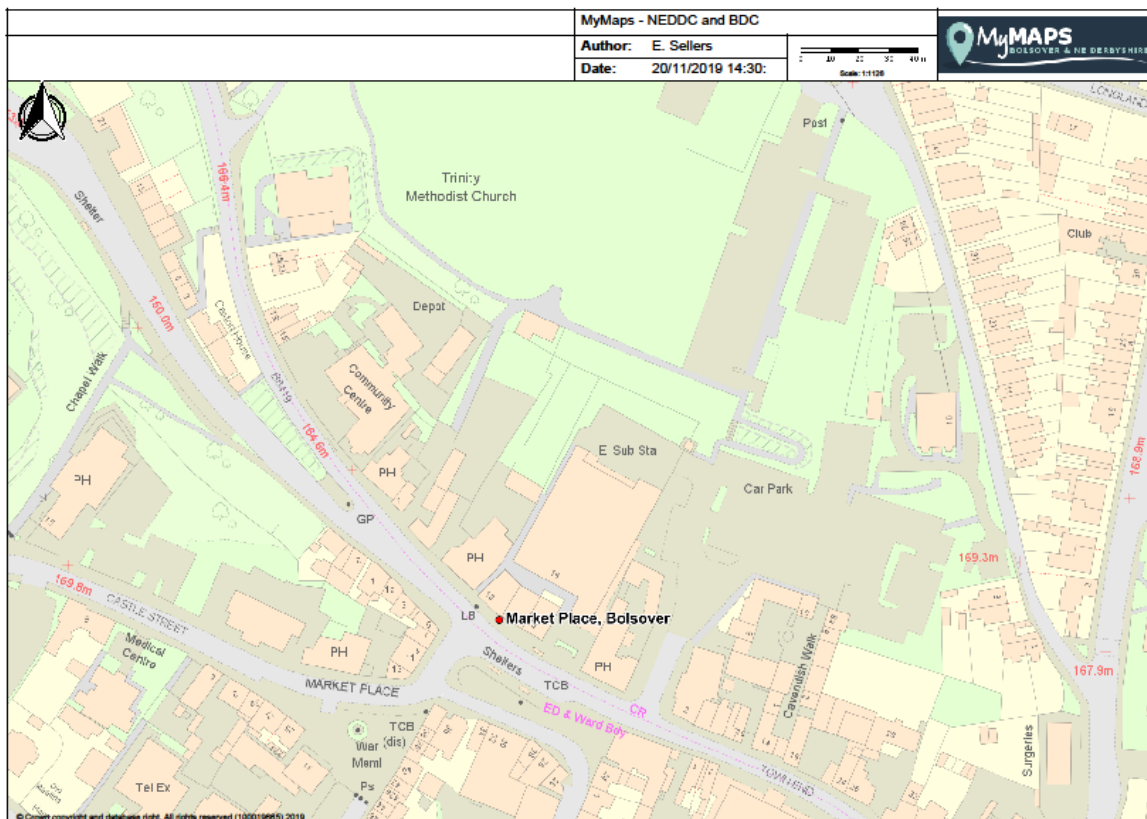
Tube Ref No 5 (26 and 27 triplicate), 15, 20, and 21 (Carter Lane East, South Normanton)



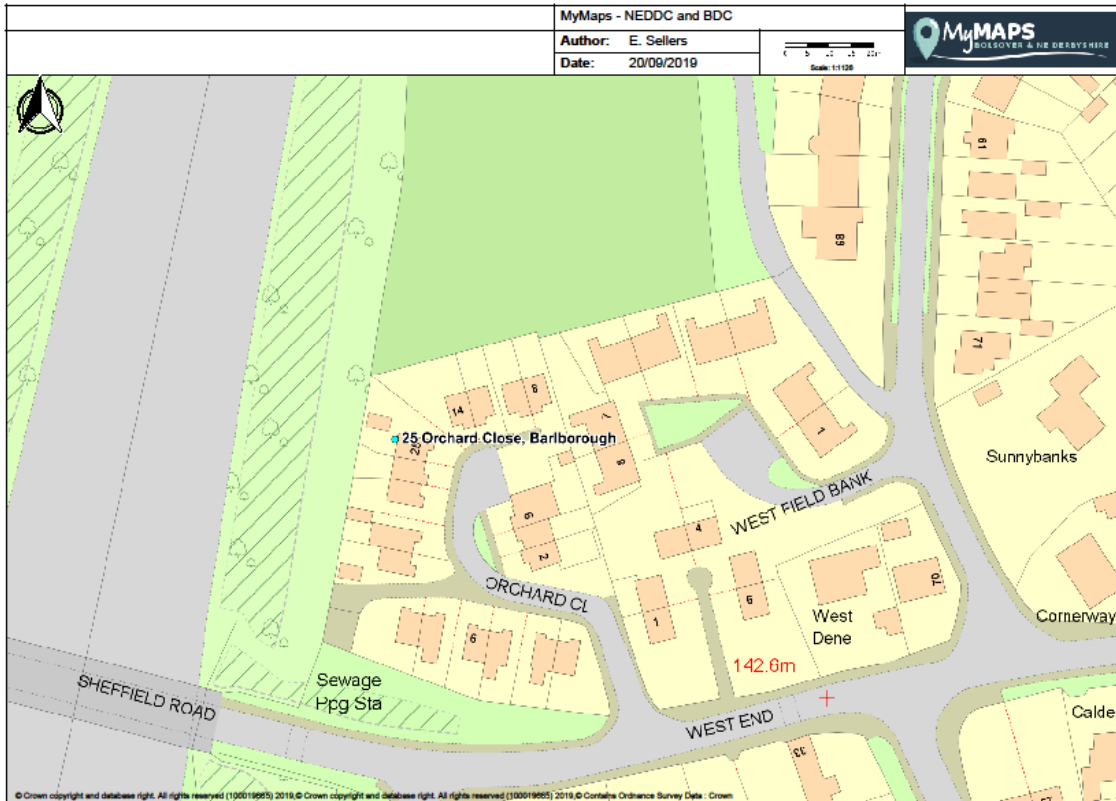
Tube Ref No 10 (57 Carter Lane West, South Normanton)



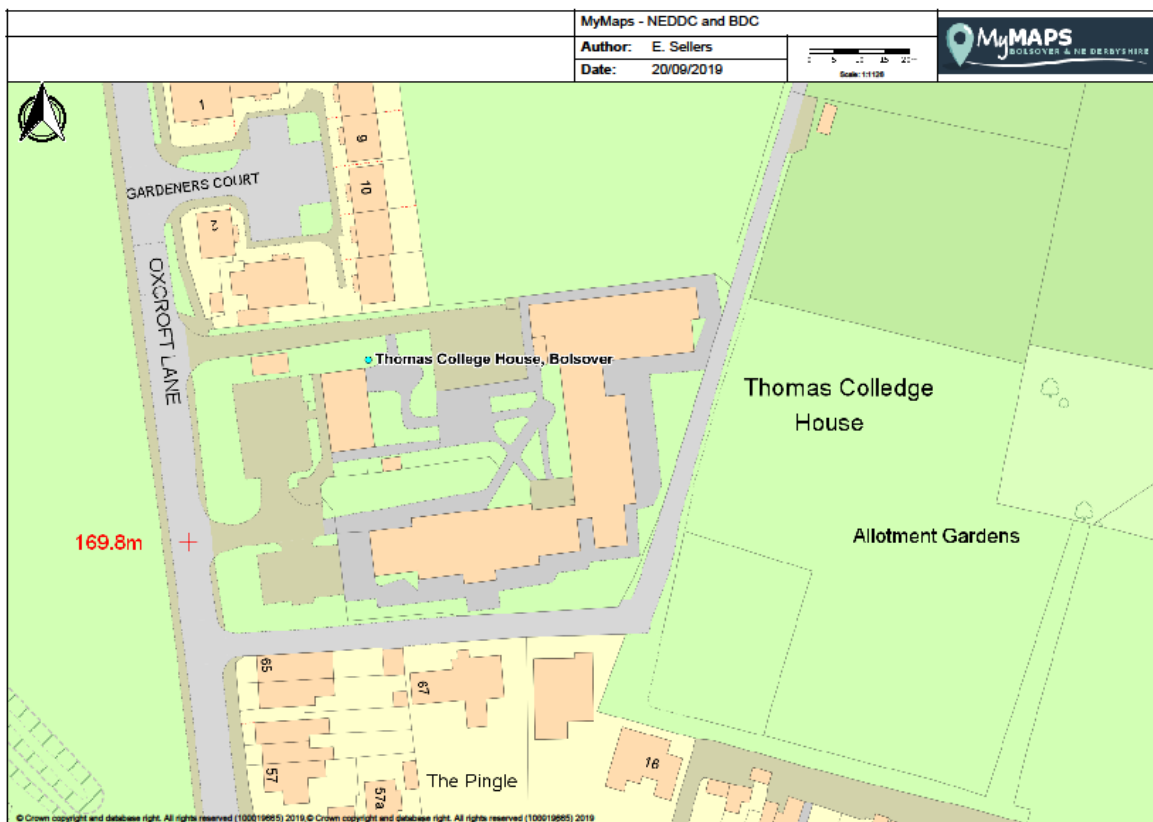
Tube Ref No 1 (11 Town End, Bolsover)



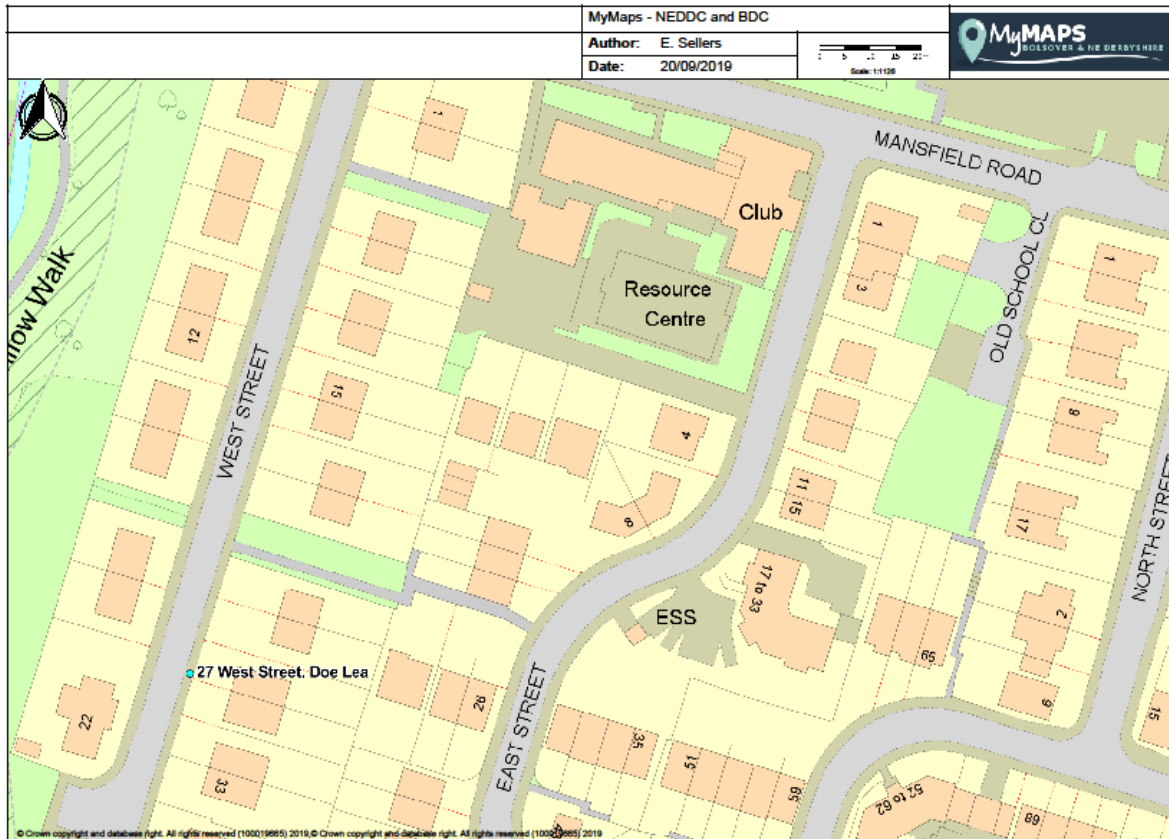
Tube Ref No 1 (Market Place, Bolsover) - DISCONTINUED



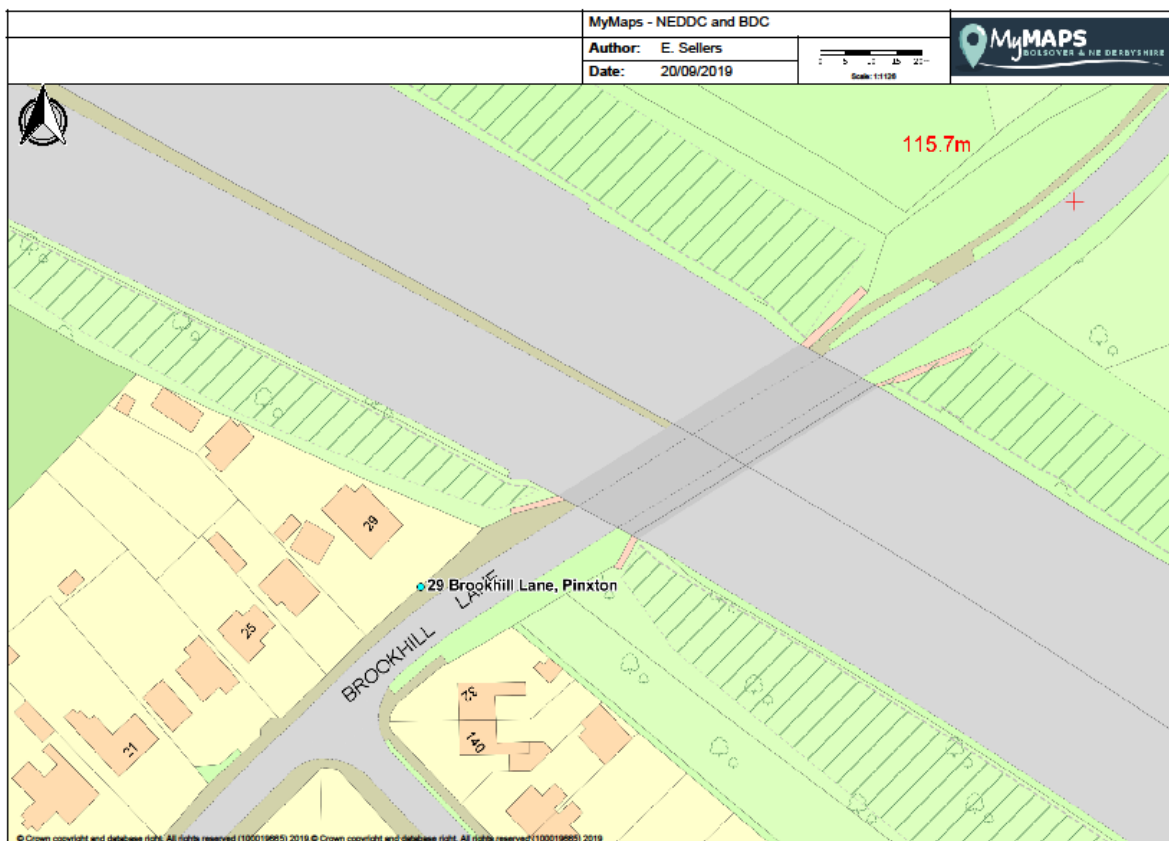
Tube Ref No 2 (25 Orchard Close, Barlborough)



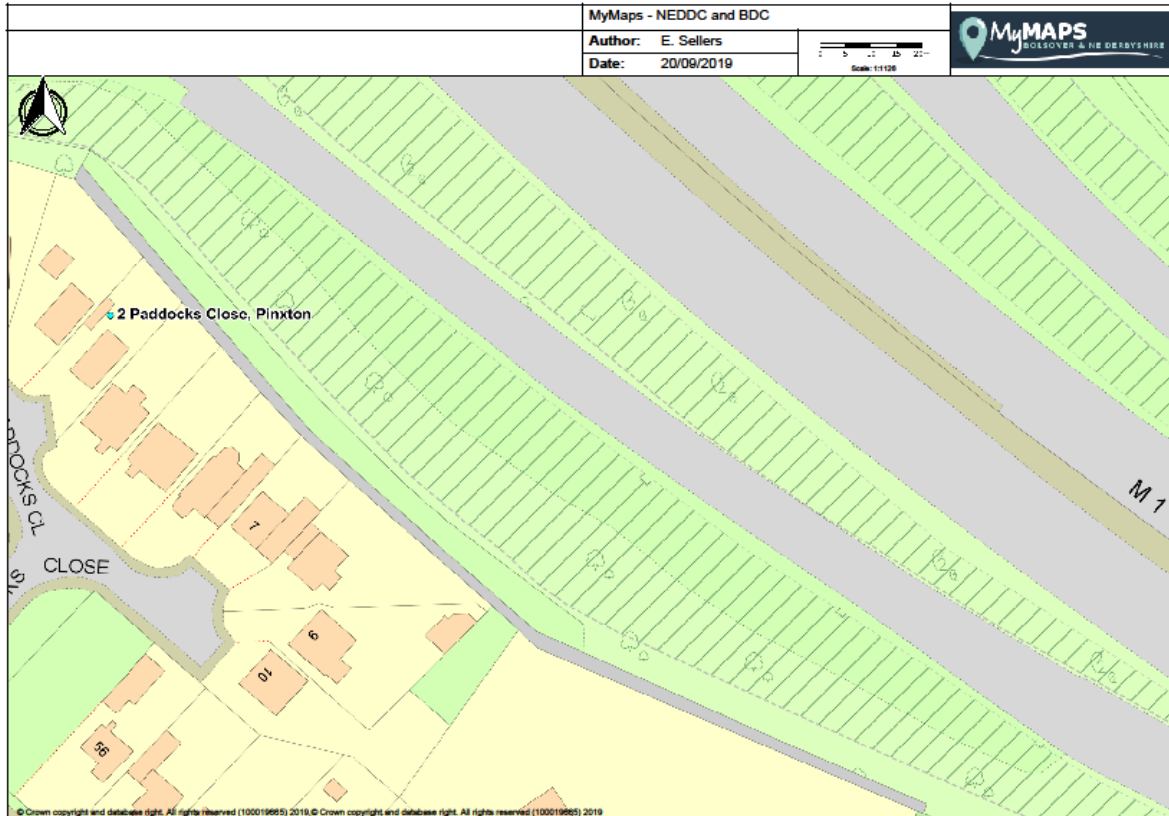
Tube Ref No 3 (25 Orchard Close, Barlborough)



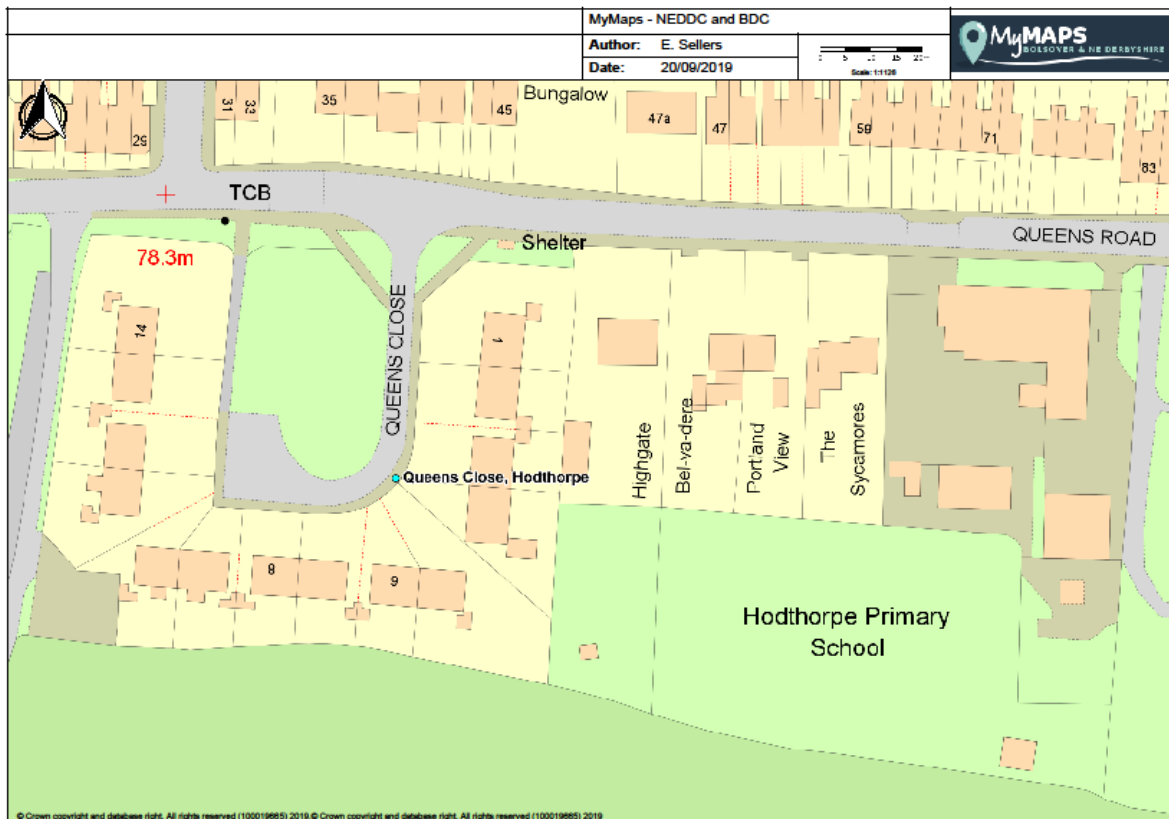
Tube Ref No 4 (27 West Street, Doe Lea)



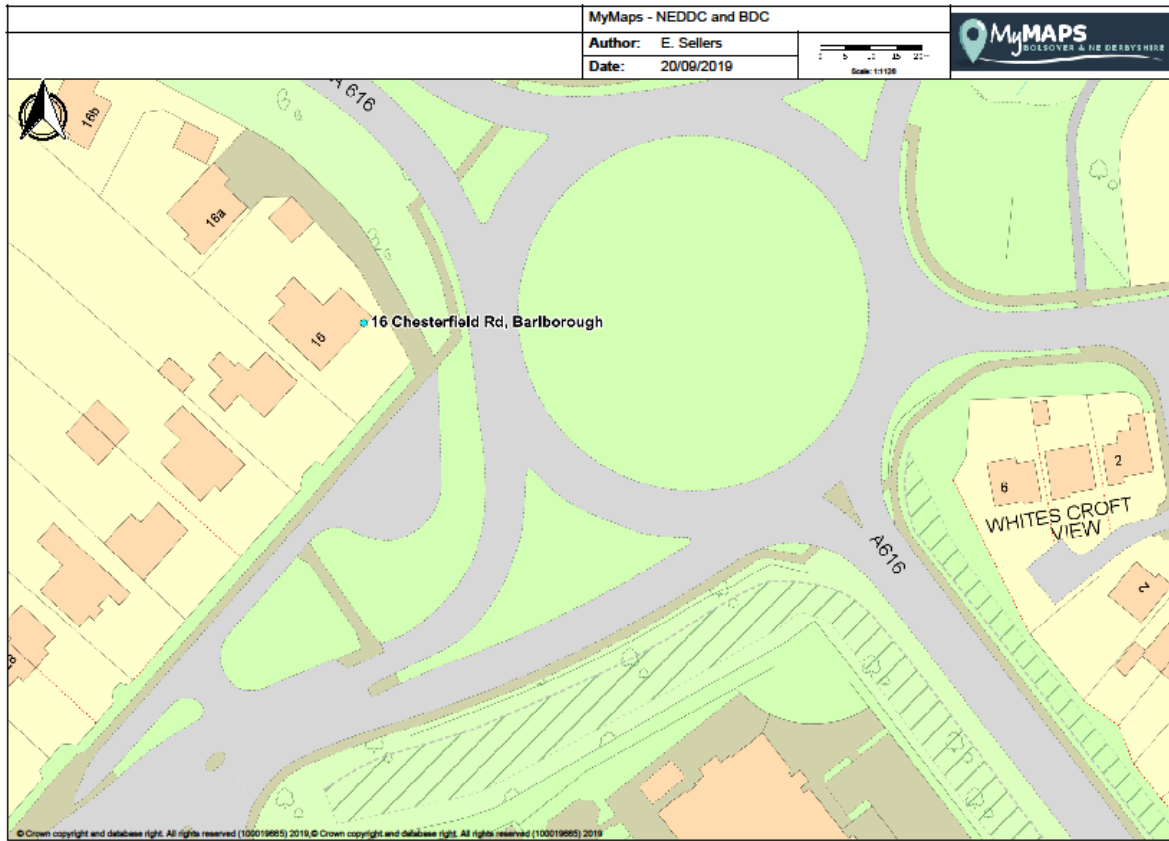
Tube Ref No 6 (29 Brookhill Lane, Pinxton)



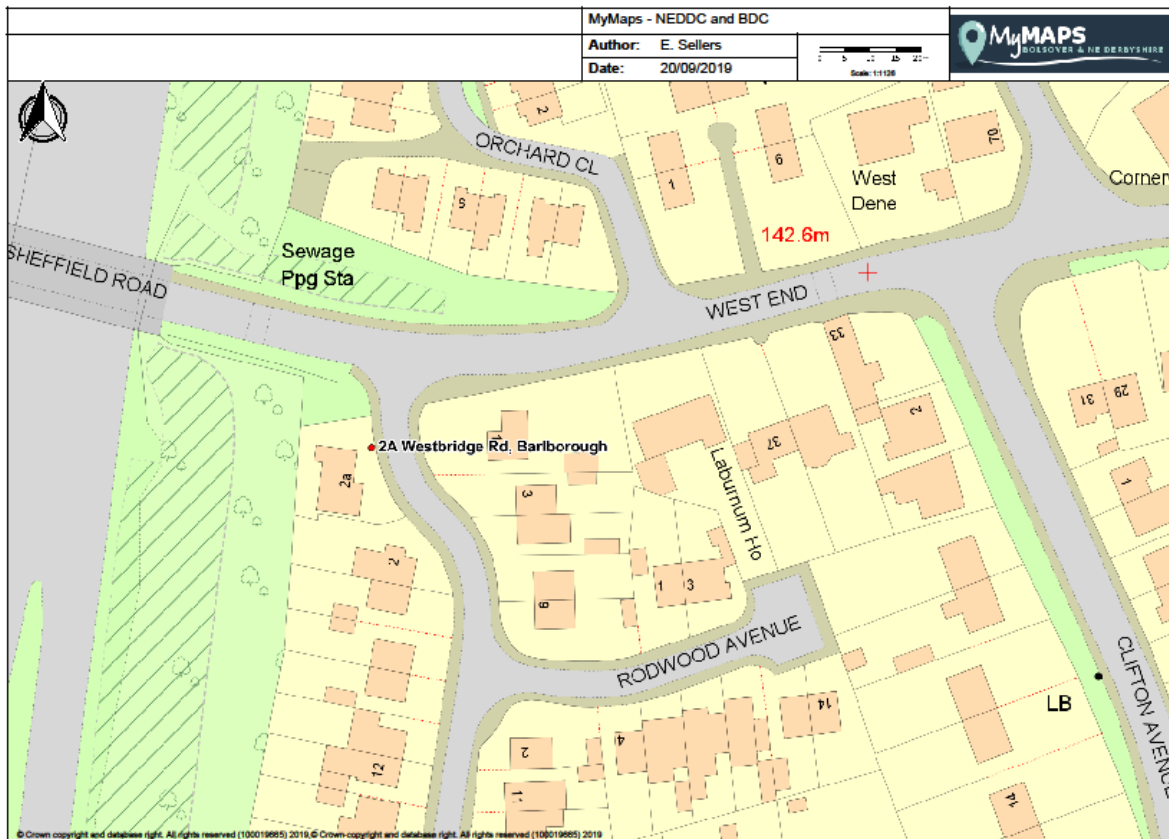
Tube Ref No 8 (2 Paddocks Close, Pinxton)



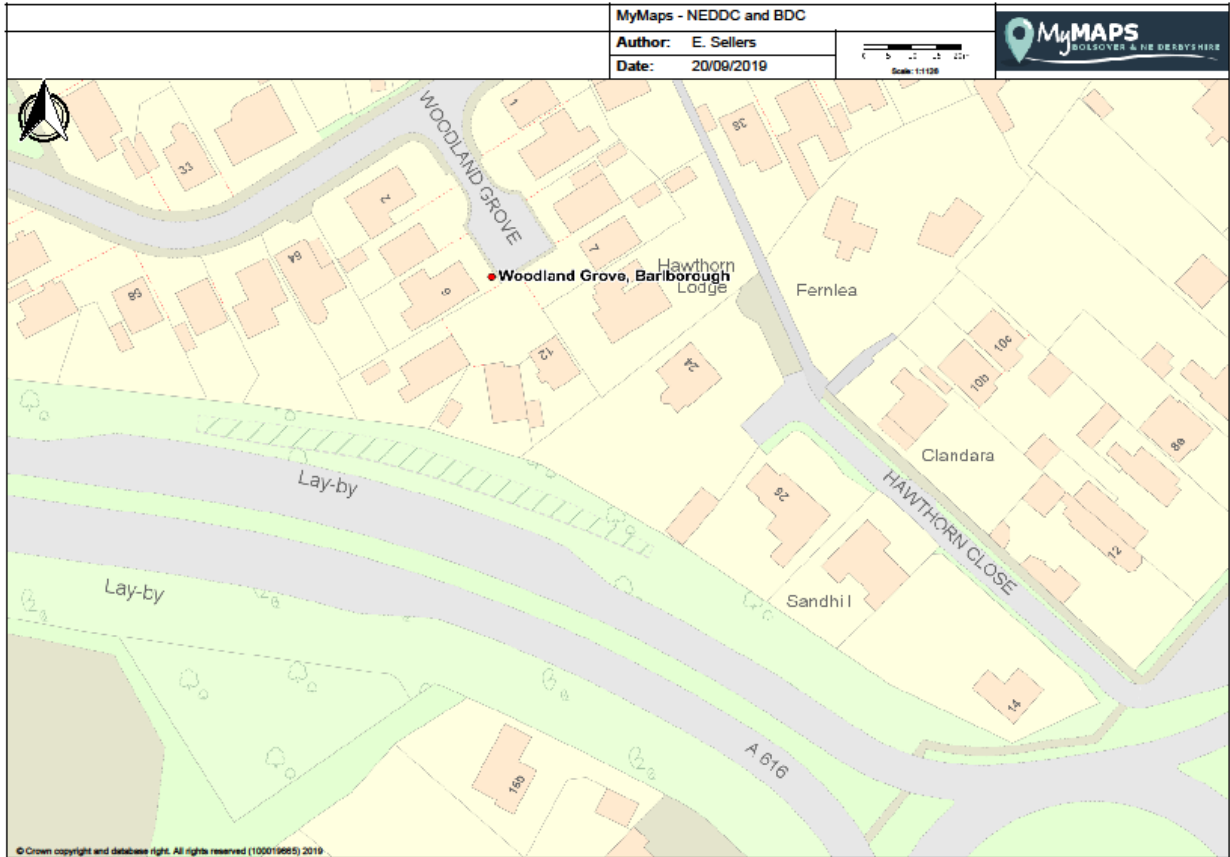
Tube Ref No 9 (Queens Close, Hodthorpe)



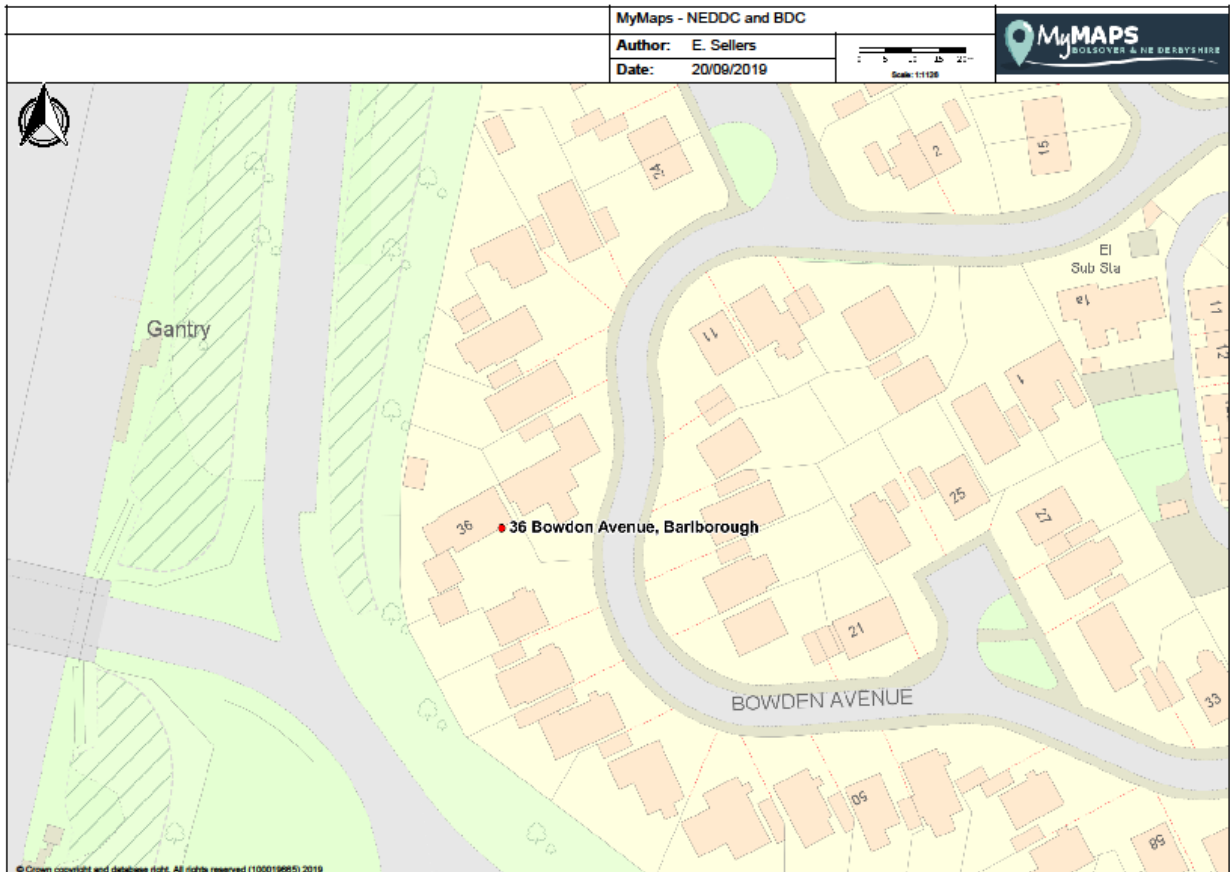
Tube Ref No 11 (16 Chesterfield Road, Barlborough)



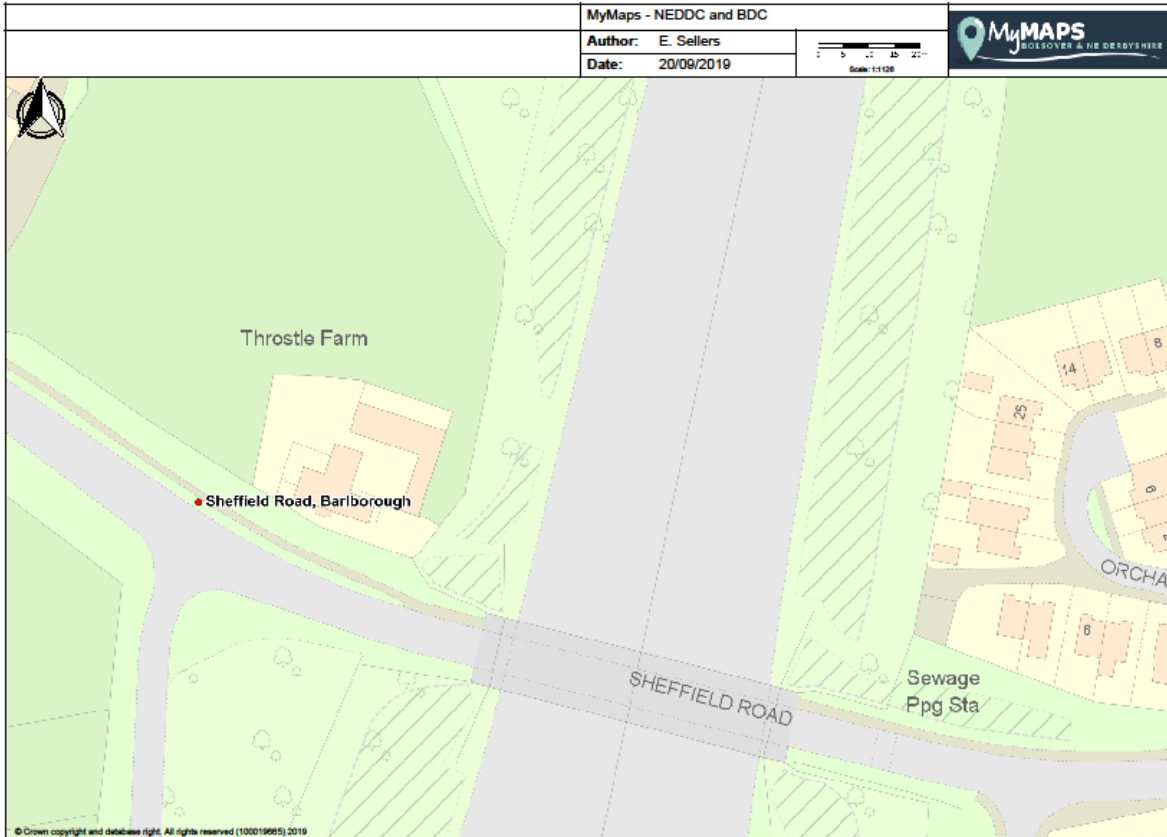
Tube Ref No 12 (2a Westbridge Road, Barlborough)



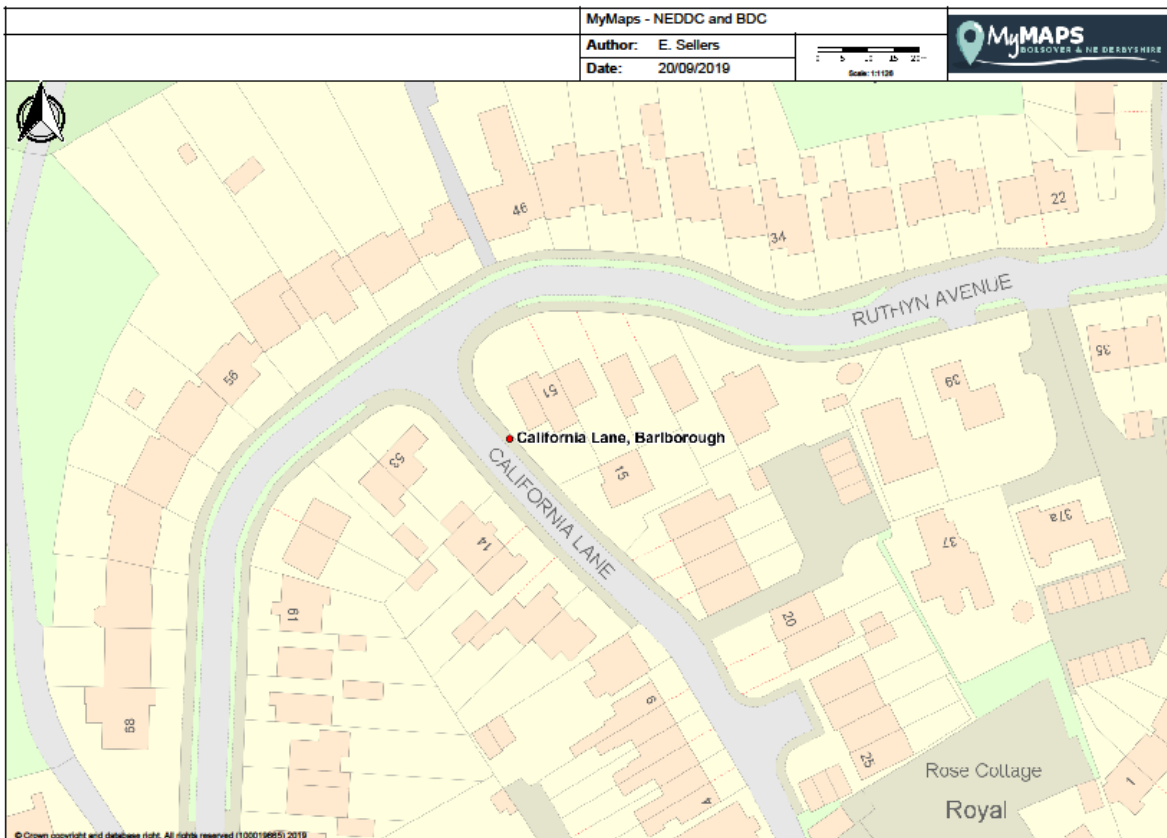
Tube Ref No 16 (Sunningdale, Woodland Grove, Barlborough)



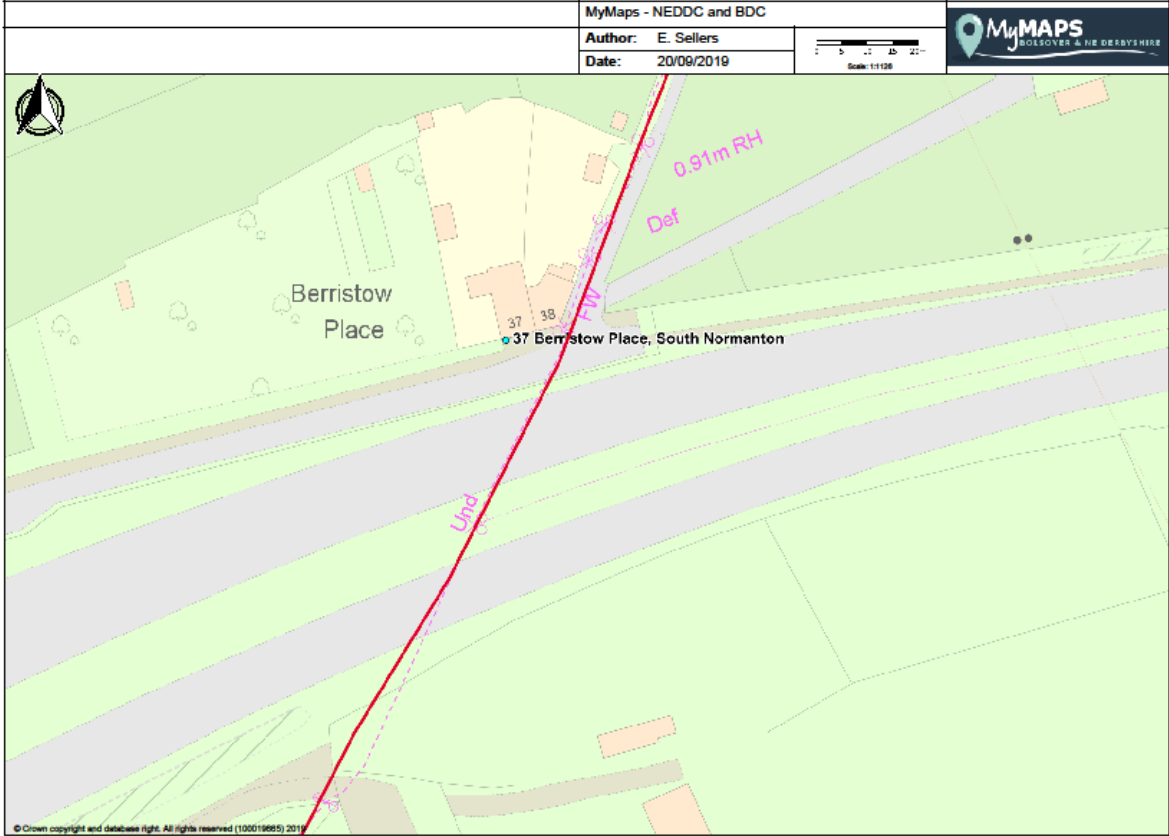
Tube Ref No 17 (36 Bowden Avenue, Barlborough)



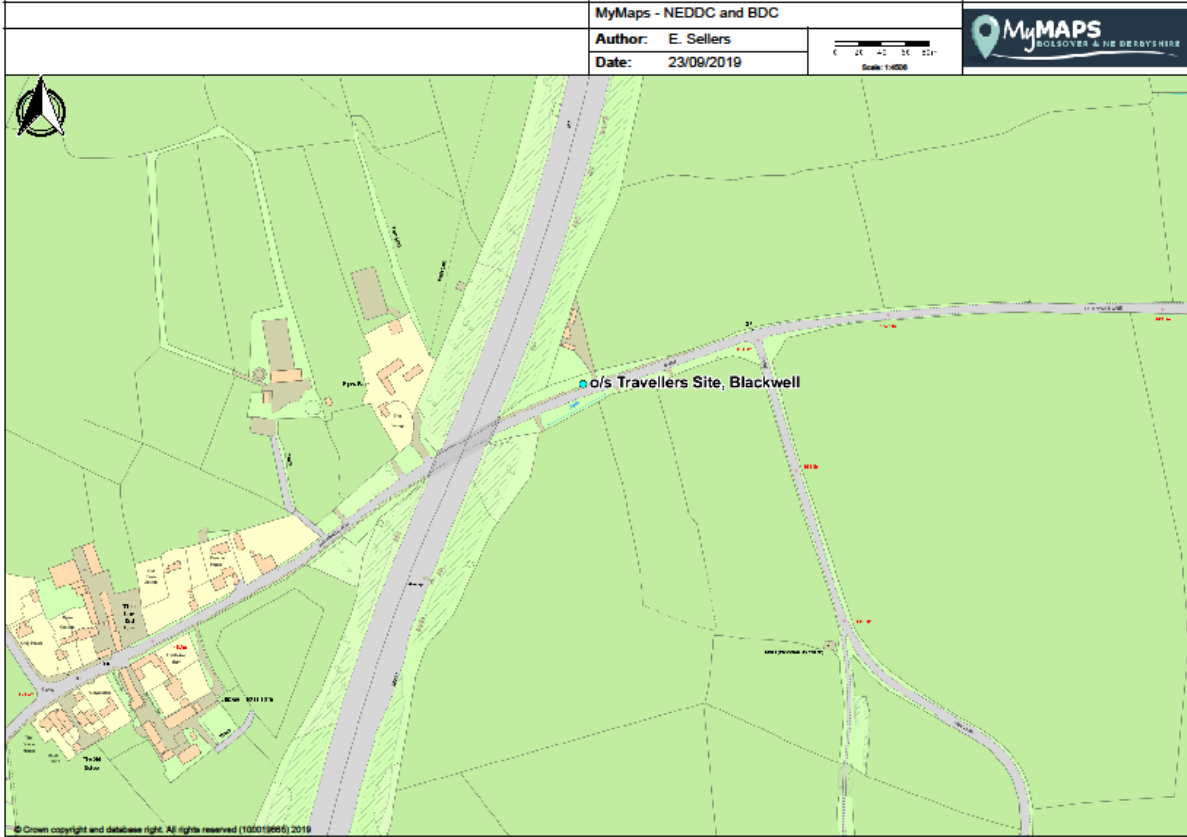
Tube Ref No 18 (Throstle Farm, Sheffield Road, Barlborough)



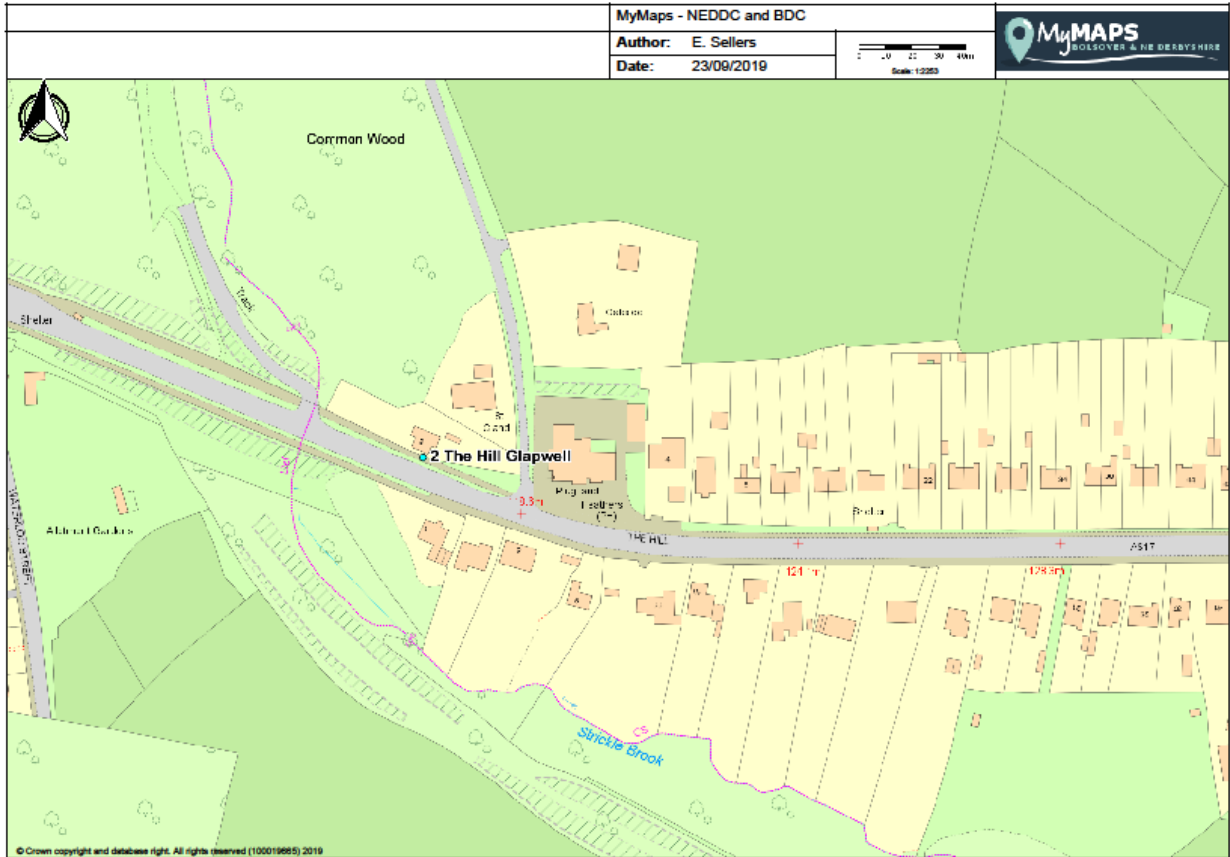
Tube Ref No 19 (California Lane, Barlborough)



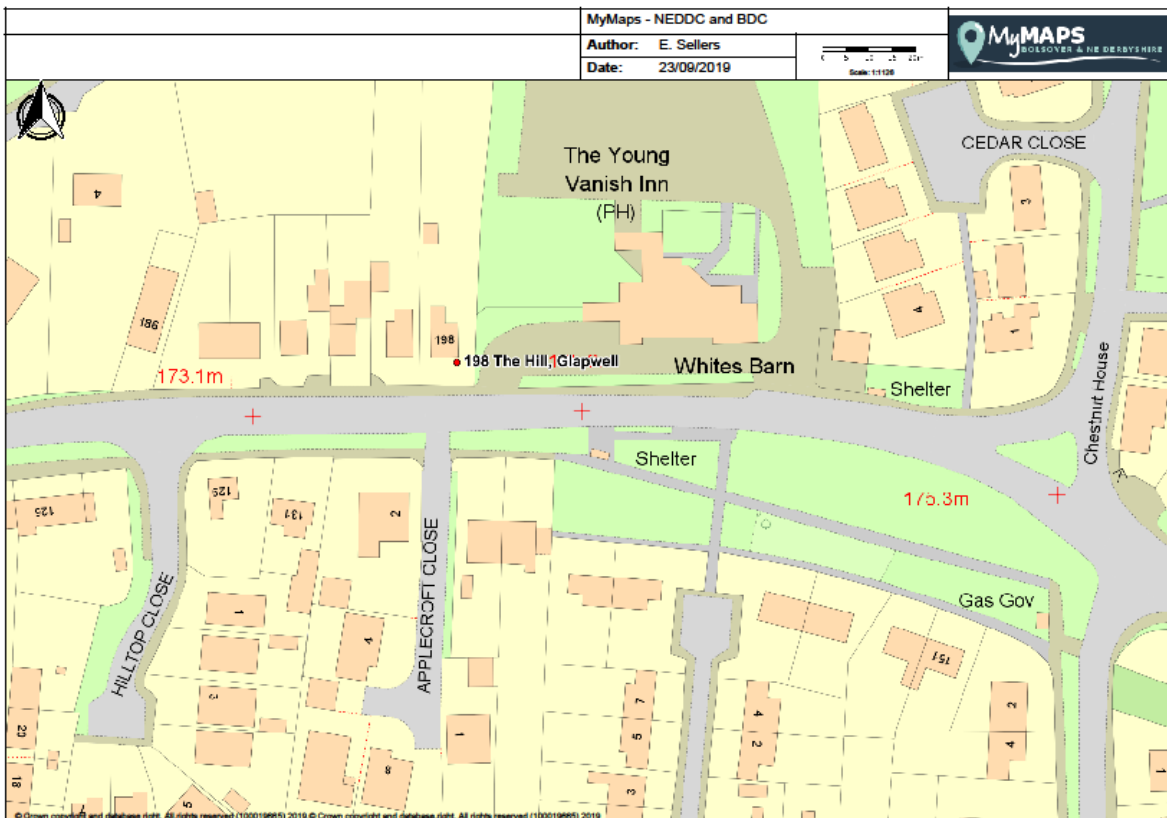
Ref No 22 (37 Berristow Place, South Normanton)



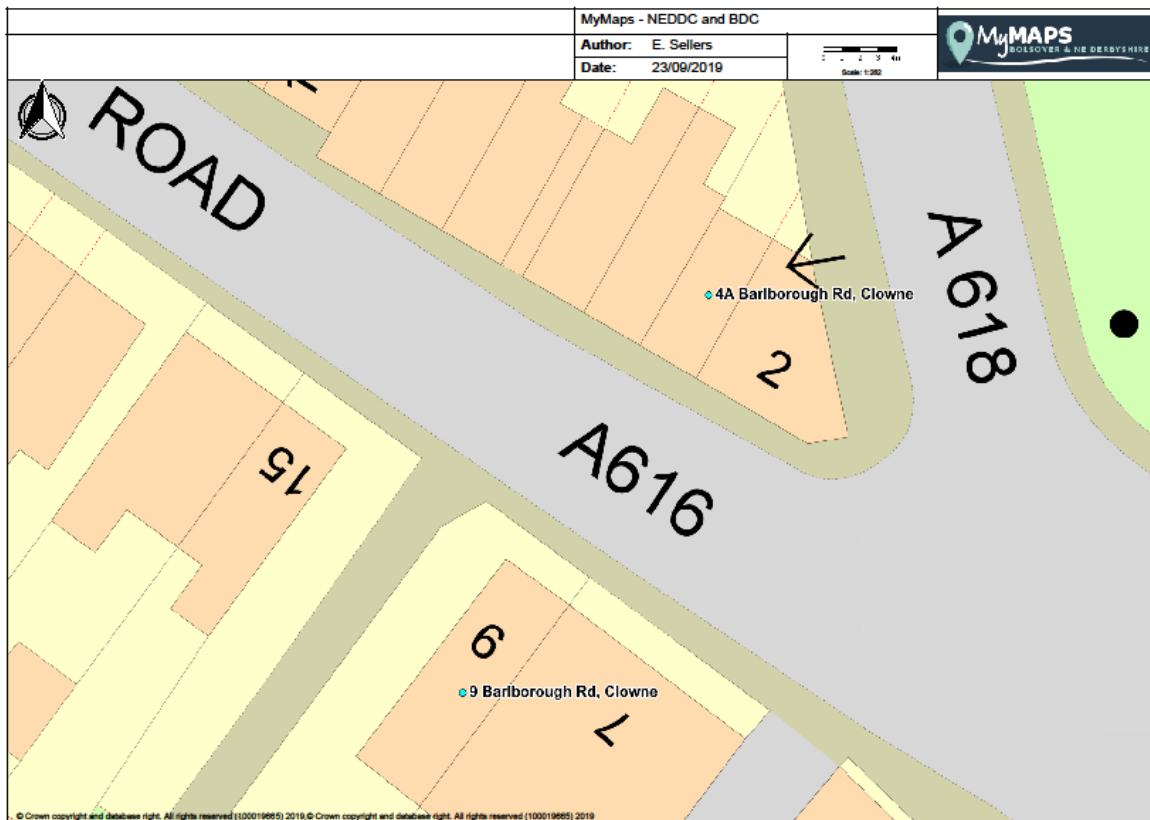
Ref No 25 (Outside Travellers Site, Blackwell)



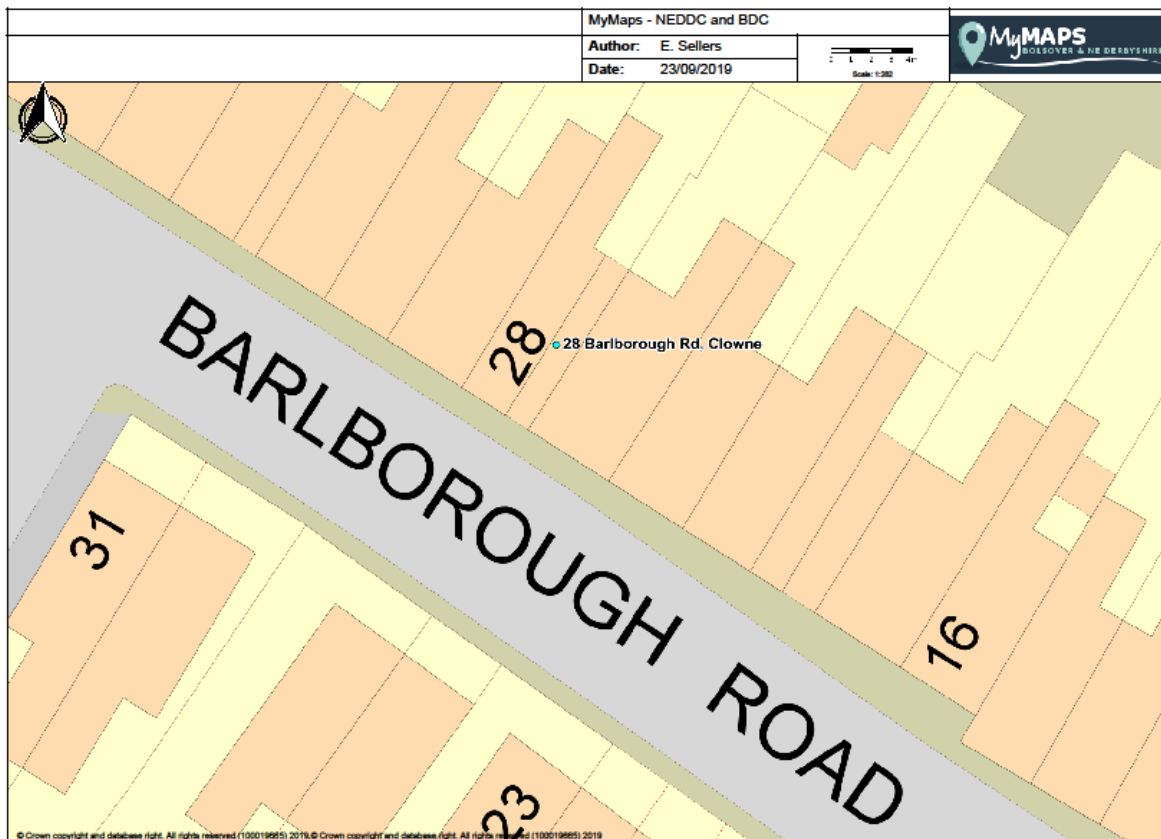
Tube Ref No 28 (2 The Hill, Glapwell)



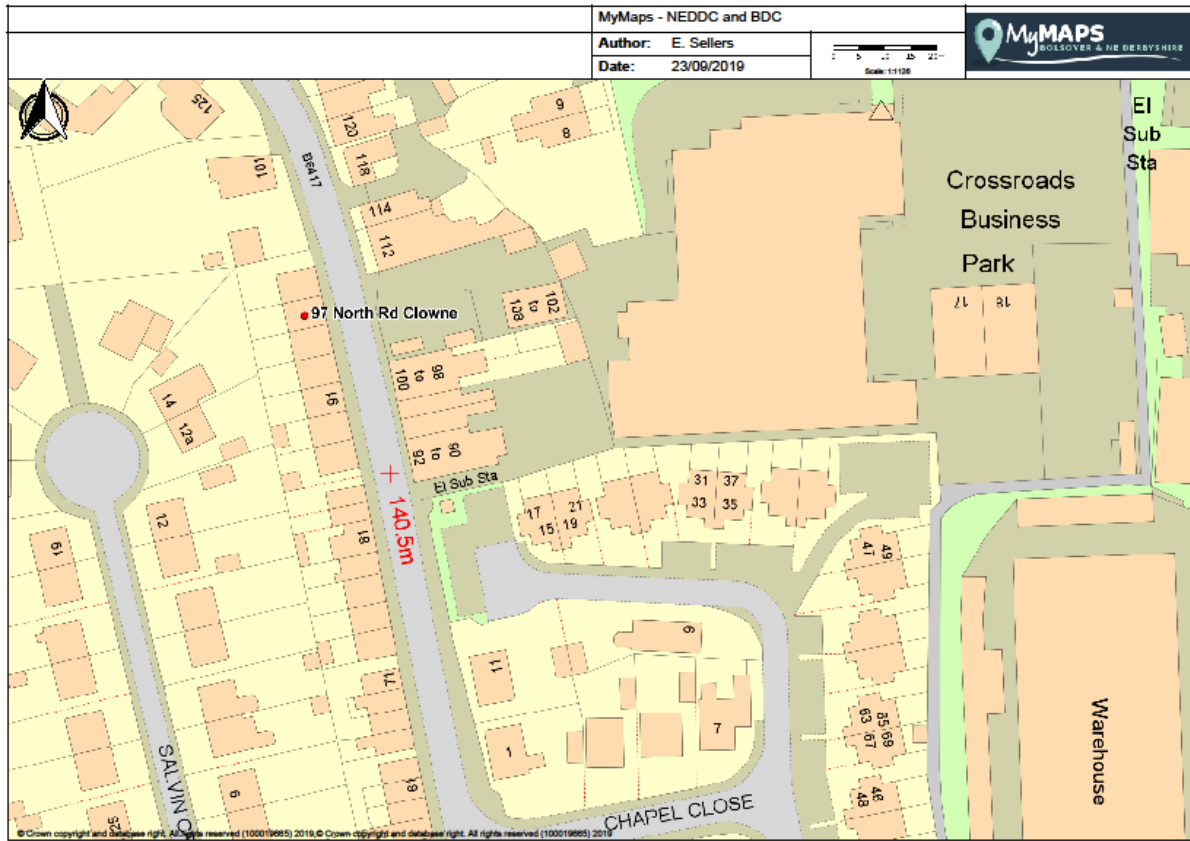
Tube Ref No 29 (198 The Hill, Glapwell)



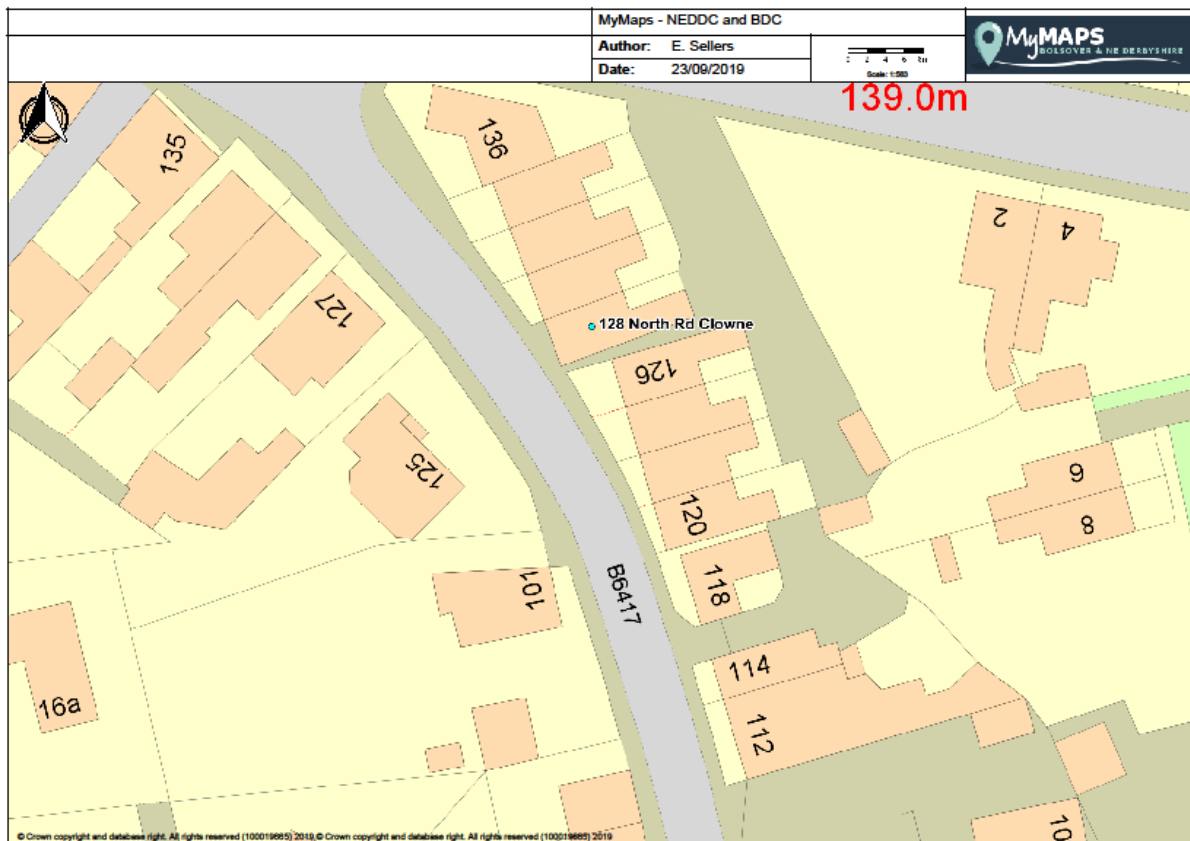
Tube Ref No 30 and 31 (4a and 9 Barlborough Road, Clowne)



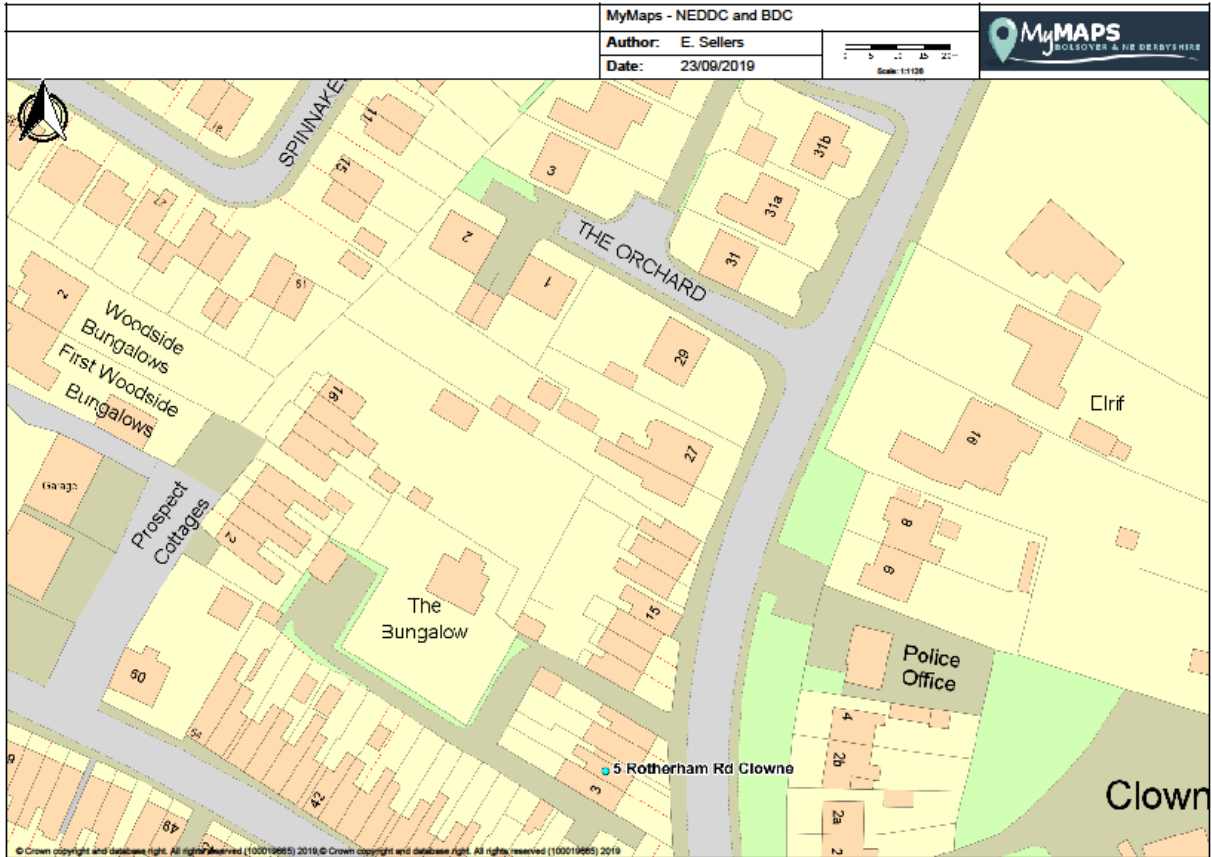
Tube Ref No 32 (28 Barlborough Road, Clowne)



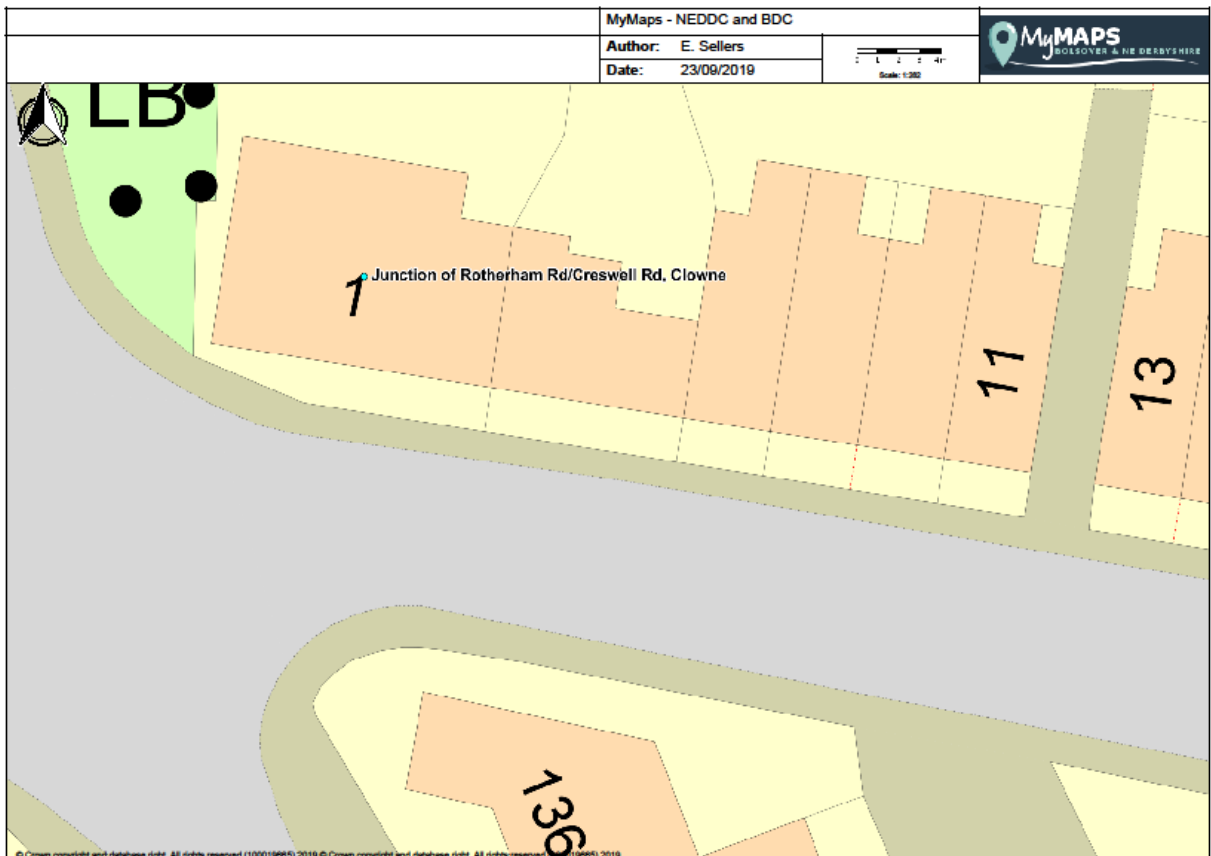
Tube Ref No 33 (97 North Road, Clowne)



Tube ref No 34 (128 North Road, Clowne)



Tube ref No 35 (5 Rotherham Road, Clowne)



Tube ref No 36 (Junction of Rotherham Road and Creswell Road, Clowne)

Appendix E: Terms of Reference of the Derbyshire County and City Air Quality Working Group -

Derbyshire County and City Air Quality Working Group

Terms of Reference 2016/17

Purpose of the Air Quality Working Group

To provide assurance to the Health Protection and Health and Wellbeing Boards of Derbyshire County and Derby City Councils around the strategic priorities to address air quality, including the management, monitoring, planning and response required to address air quality across the geographical area and protect the public's health.

A working group for agreeing strategic priorities and ensuring collaborative action around air quality through the facilitation of relationships between stakeholders, sharing best practice, ensuring collaborative working in applications for resources, collating common evidence base and monitoring progress on action.

Scope

To provide strategic oversight of work to address air quality across the geographical area. This will include priorities and initiatives across a range of stakeholders including;

- Borough and District Councils; Planning, Transport, Environmental Health
- Derbyshire County and City Council; Planning and Transport
- Derbyshire County and Derby City Public Health
- Clinical Commissioning Groups
- NHS providers

Objectives

To provide strategic oversight of work to reduce the impact of air quality on health across Derbyshire County and Derby city.

Discharging Functions

The group will discharge functions through local task and finish groups as required or associated groups as required including Planning and Health and Chief Regulators Group. Members will be expected to ensure arrangements for reporting as required within their respective organisation.

Membership

Core membership shall comprise key stakeholders from the following list. The group may agree to co-opt to its core membership to other individuals, to reflect particular needs or work areas including Voluntary groups, Environment Agency, Highways Agency, Neighbourhood Groups. Members will be expected to represent both their professional work area and organisation.

Chair; Director of Public Health for Derby City Council
Deputy Chair; Consultant in Public Health for Derby City

Members;

Director of Public Health for Derbyshire County
Derbyshire County Council Planning
Senior Public Health Manager Derby City and Derbyshire County Council
Public Health Communications Lead

Public Health England Air Quality Leads
Clinical Commissioning Group representation
Group Manager, Traffic and Transportation, Derby City
Senior Project Officer, Sustainable Travel Team, Derbyshire County Council
Transport Strategy Manager, Derbyshire County Council
Head of Planning Services, Derbyshire County Council
Senior Planning Officer, Derby City
Environmental Health Manager, Southern Derbyshire District Council
Environmental Health Manager, Southern Derbyshire District Council
Environmental Health Officer, North East Derbyshire and Bolsover District Council
Senior Environmental Health Officer, Derby City Council
Principle Development Manager, [Sustrans](#)

Membership must ensure representation from a range of professional groups including Planning, Health, Public Health, Environmental Health, [Transport](#).

Each organisation will ensure senior representation on the Board.

Accountability and Reporting

The group will report and be accountable to the Derbyshire Health Protection Board and respective Health and Wellbeing Boards. A summary report will be provided to the Health Protection Board under the standing agenda item Environmental Health.

Working Arrangements

The Chairperson of the group will be the Director of Public Health for Derby City Council and will deputise to the Consultant in Public Health for Derby City as required.

All meeting papers will be circulated at least seven days in advance of the meeting date.

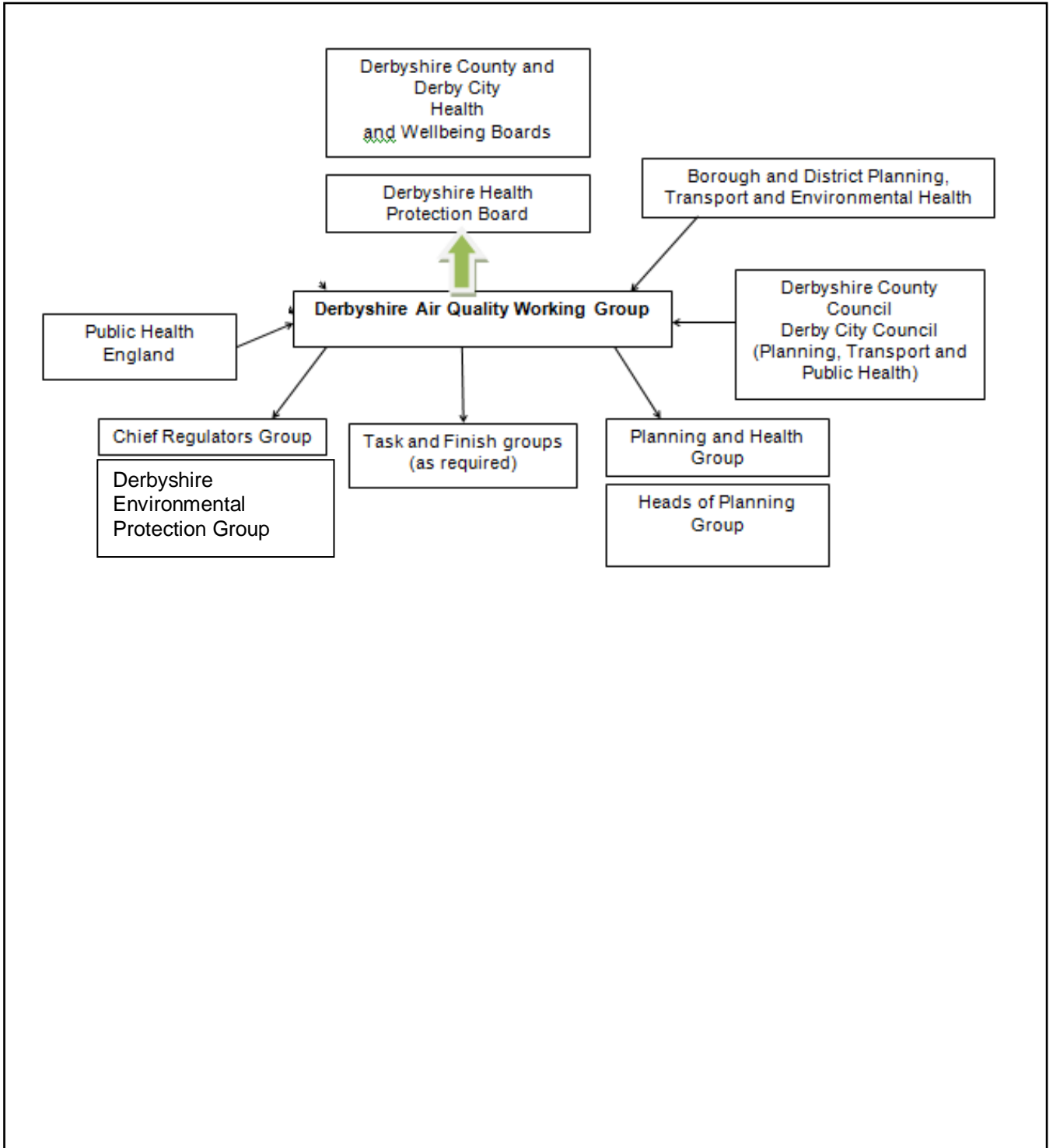
The notes and action notes will be formally recorded. These will be circulated to members and those in attendance within 14 working days of the meeting.

Meetings will be held quarterly and will utilise video conferencing facilities where possible.

Standing agenda items will include the following:

- Apologies
- Notes from previous meeting
- Work plan review
- Organisational updates
- AOB

Terms of reference will be reviewed annually.



Appendix F: Summary of Air Quality Objectives in England

Table F.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
...	...

References

Air Quality (England) Regulations 2000 (SI 928).

Air Quality (England) (Amendment) Regulations 2002 (SI 3043)

Environment Act 1995

Local Air Quality Management Technical Guidance LAQM.TG(16)

Bolsover District Council - Stage 3 Local Air Quality Review and Assessment, December 2000.

Bolsover District Council - Local Air Quality Updating and Screening Assessment, January 2004.

Bolsover District Council - Local Air Quality Management Detailed Assessment, November 2004.

Bolsover District Council - Local Air Quality Updating and Screening Assessment, June 2006.

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Bolsover District Council - Progress Report 2007

Bolsover District Council - Local Air Quality Management Addendum to Further Assessment Report, August 2008

Bolsover District Council - Local Air Quality Management Further Assessment Report, July 2009.

2009 Air Quality Updating and Screening Assessment for Bolsover District Council August 2009.

Bolsover District Council - Air Quality Action Plan, Progress Report 2009

Bolsover District Council - Progress Report 2010

Bolsover District Council - Progress Report 2011

Bolsover District Council - Air Quality Updating and Screening Assessment 2012

Bolsover District Council - Air Quality Action Plan, Progress Report 2012 Bolsover District Council - Bolsover District DRAFT Local Plan

2013 Air Quality Progress Report for Bolsover District Council

2016 Air Quality Annual Status Report, Bolsover District Council

2017 Air Quality Annual Status Report, Bolsover District Council

2018 Air Quality Annual Status Report, Bolsover District Council