South Derbyshire District Council

2023 Air Quality Annual Status Report (ASR)

In fulfilment of Part IV of the Environment Act 1995

Local Air Quality Management

Date: June 2023

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Executive Summary: Air Quality in Our Area

Air Quality in South Derbyshire

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, the elderly, and those with existing heart and lung conditions. There is also often a strong correlation with equalities issues because areas with poor air quality are also often less affluent areas[1,2].

The mortality burden of air pollution within the UK is equivalent to 28,000 to 36,000 deaths at typical ages[3], with a total estimated healthcare cost to the NHS and social care of £157 million in 2017[4].

In South Derbyshire, respirable particulates are estimated to contribute to 42 ‘attributable deaths’ per year and to 439 associated life years lost for the population aged over 25.

Air quality across all of South Derbyshire has been continuously improving over the past decade.

The Council is satisfied that air quality across South Derbyshire meets all current health based statutory Objectives.

Air quality (nitrogen dioxide) is currently monitored at 24 locations representative of the highest likely exposure to the main sources of air pollution.

Air quality has been monitored at 17 of these locations for 10 years or more. Measured results at all 17 of these monitoring locations have improved over this period.

All monitoring locations demonstrated that nitrogen dioxide (NO_2) levels in 2022 were below the annual average Air Quality Objective of 40 µg/m^3.

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[1] Public Health England. Air Quality: A Briefing for Directors of Public Health, 2017

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

[3] Defra. Air quality appraisal: damage cost guidance, July 2020

[4] Public Health England. Estimation of costs to the NHS and social care due to the health impacts of air pollution: summary report, May 2018

There is no evidence to suggest that any other air pollutants are exceeding, or close to exceeding, the Air Quality Objectives.

Air quality in South Derbyshire was the cleanest in recent history in 2020, almost certainly because of the reduction in local road traffic due to the Covid-19 pandemic.

Monitoring data from 2022 provides encouragement that the improvements in air quality observed during 2020 may have been sustained.

South Derbyshire is one of the fastest growing Council areas in the country. None the less, evidence from monitoring locations across the District indicates that the various activities by South Derbyshire District Council and partner agencies described in this Annual Status Report are having a meaningful benefit on air quality and by extension on the health of residents and visitors.

The main pollutant of concern in South Derbyshire is nitrogen dioxide (NO_2). This is a product of combustion, its most dominant source being from road traffic.

Measured levels of nitrogen dioxide can vary quite significantly at each monitoring location from month to month and from year to year mainly due to fluctuations in weather, sunlight, traffic flows and compositions. Overall, the trends in measured levels of NO_2 in South Derbyshire are showing a reduction over the last decade.

- The High Street (A511) in Woodville continues to provide the most concern about a potential exceedance of the annual average Objective for NO_2. We have four monitoring locations near to the clock island junction (High Street / Moira Road) and one at the junction of High Street and Hepworth Way. Over the last ten years air quality has improved at all these.
- Prior to the construction of the Woodville – Swadlincote link road we also started monitoring air quality in locations predicted to experience changes in traffic flows as a result of this highway development. Early data from these locations is presented in this report and the first year of data provides comfort that measured NO_2 is well within the legal Limit Values.
- There are three monitoring locations in Repton. All three show an improving trend in air quality since the Council started monitoring in 2012.
- The two monitoring locations in Overseal show an improvement over the last decade.

- The two monitoring locations in Church Gresley both show an improvement in air quality over the last decade.
- Two new monitoring locations have been established in Stenson Fields to monitor the impacts of new development in this area. Data from the first year shows that air quality is well within the legal Limit Values.
- Of the remaining monitoring locations, air quality has shown an improving trend in Hatton, Burnaston and Willington. At the two monitoring locations along the A444 there has been an improvement at both.

Table 1 summarises the long-term trends (10 years) in air quality across all monitoring locations.

Table 1 – Long Term Air Quality Monitoring Trends by Location

Location	Long Term Air Quality Trend	Compliant with AQ Objectives?
High Street, Woodville	Improving	Yes
Church Gresley	Improving	Yes
Hatton	Improving	Yes
Overseal	Improving	Yes
A444	Improving	Yes
Repton	Improving	Yes
A38	Improving	Yes
Willington	Improving	Yes

Actions to Improve Air Quality

Whilst air quality has improved significantly in recent decades, and will continue to improve due to national policy decisions, there are some areas where local action is needed to improve air quality further.

The 2019 Clean Air Strategy[5] sets out the case for action, with goals even more ambitious than EU requirements to reduce exposure to harmful pollutants. The Road to Zero[6] sets out the approach to reduce exhaust emissions from road transport through a number of mechanisms; this is extremely important given that the majority of Air Quality Management Areas (AQMAs) are designated due to elevated concentrations heavily influenced by transport emissions.

Because air quality in South Derbyshire has never exceeded the Air Quality Objectives, the Council has never declared an AQMA. Currently the main interventions to improve air quality are as follows;

- Developing and implementing a diverse range of actions through the Council's Climate and Environment Action Plan, which has been independently assessed as one of the best in the UK.
- Making a positive contribution through the planning and development control process by requiring air quality mitigation appropriate to the impact of the development.
- Making a positive contribution through the Council's regulation of industrial emissions.
- Reducing the Council's own emissions through a programme of continued environmental improvements to an accredited environmental management standard (ISO14001).
- Investigating and intervention in air pollution incidents.
- Utilising social media to promote predicted high air quality pollution episodes and enabling sensitive individuals to manage the impact on them.

Conclusions and Priorities

- No exceedances of air quality standards have been observed in South Derbyshire in 2022.

[5] Defra. Clean Air Strategy, 2019

[6] DfT. The Road to Zero: Next steps towards cleaner road transport and delivering our Industrial Strategy, July 2018

- There is no need for the Council to consider the need to declare an Air Quality Management Area.
- The trend across all monitoring locations in South Derbyshire is that air quality has been progressively improving.
- No new development has been completed in South Derbyshire in 2022 which is expected to have a significant adverse impact on air quality.
- Improvements in air quality in South Derbyshire will be significantly influenced by the Councils Climate and Environment Action Plan.
- South Derbyshire District Council have already endorsed the Derby and Derbyshire Air Quality Strategy, and the Council will take a decision on endorsing a revised Derby and Derbyshire Air Quality Strategy when it is published in 2023.

Local Engagement and How to get Involved

The main contributions that the community can make to improving air quality are around taking personal and community action around minimising emissions from traffic and other sources and limiting exposure at times of poor air quality. Specifically, that means avoiding unnecessary car use for short journeys, utilising public transport where possible, buying and maintaining low emissions vehicles and being linked into the national alert system for predicted episodes of poor air quality. Full details are contained in the reference section.

Air quality in South Derbyshire improved by up to 30% in 2020 compared to 2019 as a direct result of the reduction in road traffic. This provided powerful evidence that moving away from reliance on personal transport by car can lead to significant environmental and health improvements.

Endorsement from the Derbyshire County Council Director of Public Health Eleanor Houlston

This report has been endorsed by:

Eleanor Houlston

Director of Public Health, Derbyshire County Council

Table of Contents

1 Local Air Quality Management

This report provides an overview of air quality in South Derbyshire during 2022. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

The statutory air quality objectives applicable to LAQM in England are presented in Table E.1.

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 should prepare an Air Quality Action Plan (AQAP) within 12 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

South Derbyshire District Council currently does not have any declared AQMAs and does not have any proposals in the foreseeable future to declare any AQMAs.

Despite not having declared any AQMAs, South Derbyshire District Council has been an active participant in the Derby and Derbyshire Air Quality Working Group. This Group was set up and led by the Directors of Public Health for Derby and Derbyshire.

In 2020 a Derby and Derbyshire Air Quality Strategy was published and approved.

On 24 April 2021 the Council Environment & Development Services Committee approved a South Derbyshire Air Quality Policy 2020-24, which was designed to closely align with the Derby and Derbyshire Air Quality Strategy.

A revision of the Derby and Derbyshire Air Quality Strategy has recently (23 June 2023) been considered by the Derbyshire Health Protection Board. The South Derbyshire Air Quality Policy will be reviewed once a final version of the Derby and Derbyshire Air Quality Strategy is approved.

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

Defra's appraisal of last year's ASR was that the conclusions reached were **accepted** for all sources and pollutants. The appraisal contained the following observations:

- It was difficult to determine if distance correction has been to the applied to the annual NO_2 mean concentration.
- It was unclear if the diffusion data has been uploaded on to the Diffusion Tube Date Entry System (DTDES) maintained by the LAQM.
- From 2023 those authorities who have not had to designate AQMAs and produce AQAPs will be required to draw up a local Air Quality Strategy. South Derbyshire District Council should submit an Annual Status Report in 2023 and draw up an Air Quality Strategy.

Despite the fact that there are no AQMAs in South Derbyshire, the Council has taken forward a number of measures during the current reporting year of 2022 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in the following Table. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented. Some of the key completed measures are:

- A total of 301 planning applications have been assessed for their impact on air quality in 2022. Where appropriate, mitigation has been implemented through the imposition of planning conditions.
- The Woodville - Swadlincote Regeneration Route was completed in late 2021 and creates the opportunity to regenerate areas of Swadlincote and to move traffic away from existing areas of high traffic congestion such as High Street, Woodville. We are actively monitoring air quality in the area to assess what change this has caused.
- In summer 2022, the Council published its third Climate and Environment Action Plan committing to strive towards carbon neutrality of the Council's services by 2030 and districtwide carbon neutrality by 2050. The Plan contains 55 actions many of which will also directly contribute to improving local air quality. The Council is already well on the way with many of the actions.

  - 42 electric car recharge points in five of our public car parks have been installed.
  - £4.2 million in funding has been secured to help improve thermal efficiency of homes across the District and therefore to reduce or remove fossil fuel combustion.
  - Smaller diesel fleet vehicles are being replaced with electric.
  - We have secured funding to run a pilot project to replace two diesel refuse collection trucks with hydrogen / diesel hybrids which will start in June 2023.
  - Petrol fuelled grounds maintenance equipment has been replaced with electric alternatives.
  - The free tree scheme enables hundreds of saplings to be planted across the District.

- The Council, in collaboration with colleagues working in Public Health, has committed to providing an annual report to the Derbyshire Health Protection Board. A fourth annual report was approved in September 2022. The annual report highlights medium-term trends in air quality across Derbyshire, will highlight to the public health and medical community areas of air quality concern and will allow greater public accessibility and scrutiny of air quality.
- A draft revised Derby and Derbyshire Air Quality Strategy has been produced through the collaborative work of the Derbyshire Air Quality Forum. The Strategy will provide direction and clear KPIs to assess how well improvements in air quality are progressing across the county.
- The Council subscribes to the governments Air Quality Bulletin website in order to receive notification of predicted episodes of poor air quality. The Council utilises its Facebook account https://www.facebook.com/southderbys to advise local residents of any predicted high air pollution episodes.
- The Council uses its regulatory powers to limit the amount of pollution being generated from industrial sites which have been issued with environmental permits.
- In November 2018, the Council launched its Corporate Environmental Sustainability Group, a Director led working group tasked with improving the Council's own environmental performance and with a specific brief to deal with transport and transport emissions.
- In November 2019, a Staff Travel Plan was published containing ambitious targets to reduce the Council's own fleet diesel consumption by 10%, grey fleet mileage by 15%. Following the implementation of the Plan over 70% of staff now either travel to work by sustainable travel or are enabled to work flexibly. Evidence from a survey in late 2022 indicates that emissions from South Derbyshire District Council staff travel has reduced by 50%.

Details of all measures completed, in progress or planned are set out in Table 2.2.

In April 2021, the Council approved its first Air Quality Strategy. This Strategy set air quality targets which align to the Derbyshire Air Quality Strategy and are much more ambitious than national targets.

The aim of this Policy **is to reduce the health impact of poor air quality for the people of South Derbyshire.**

The priorities of the Policy are:

- **To seek to reduce the sources of pollution within and outside South Derbyshire which contribute to poor air quality.**
- **To prioritise and support those interventions which offer additional health benefits.**
- **To mitigate the impacts of poor air quality on health.**
- **To strike a balance between the occasional tensions between climate change interventions and local air quality interventions.**

The targets contained in the Policy are summarised in Table 2 along with current performance outcomes.

Table 2 – Air Quality KPIs in the South Derbyshire Air Quality Policy 2020-24

Outcome	2017 Derbyshire Baseline	South Derbyshire		
		2019 Baseline	2024 Target	2022 Actual
Fraction of mortality attributed to particulate matter air pollution	5.1% (2019)	5.3%	5.1%	5.4% (Latest data 2021)
Average annual measured concentration of nitrogen dioxide	28.8 µg/m^3	23.8 µg/m^3	23.0 µg/m^3	20.0 µg/m^3
Maximum annual average measured concentration of nitrogen dioxide	49.9 µg/m^3 (County) 61.9 µg/m^3 (City)	32.7 µg/m^3	36.0 µg/m^3	26.9 µg/m^3
Number of air quality monitoring sites	272	16	19	24
Number of monitoring sites where the annual average measured concentration of nitrogen dioxide exceeds 40µ/m3	13	0	0	0
Number of Air Quality Management Areas	8	0	0	0
Predicted annual average and maximum background PM_{10}	No data	Mean 12.7 µg/m^3 Max 16.1 µg/m^3	Mean 12.2 µg/m^3 Max 15.6 µg/m^3	Mean 12.5 µg/m^3 Max 15.9 µg/m^3

Predicted annual average and maximum background $PM_{2.5}$	No data	Mean 7.8 $\mu g/m^3$ Max 9.7 $\mu g/m^3$	Mean 7.4 $\mu g/m^3$ Max 9.3 $\mu g/m^3$	Mean 7.6 $\mu g/m^3$ Max 9.5 $\mu g/m^3$

Table 2.1 – Progress on Measures to Improve Air Quality

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
1	Air quality mitigation measures in the South Derbyshire Design Guide (Design SPD)	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	2024	SDDC	SDDC	NO	Funded	< £10k	Implementation	Overall reduction in emissions per developed floorspace	301 planning responses in 2021	Design SPD approved. Model planning conditions produced.	Pressure for planning approval without air quality conditions
2	Woodville - Swadlincote Regeneration Route	Transport Planning and Infrastructure	Other	2020	2022	DCC	D2N2 Growth Fund	NO	Funded	£1 million - £10 million	Completed	Mass emission and exposure reduction to PM and NO2	Reduced NO2 exposure in High Street Woodville	Road complete	
3	Replacement of solid fuel heating appliances with Air Source Heat Pumps in South Derbyshire Council homes	Promoting Low Emission Plant	Shift to installations using low emission fuels for stationary and mobile sources	2018	2019	SDDC	ECO	NO	Funded	£500k - £1 million	Completed	1.5 to 3 tonne reduction in PM emission	54 Air Source Heat Pumps fitted	Overseal Project complete	Maintenance costs
4	Derbyshire Healthy Home Programme	Other	Other	2015	2023	DCC	Better Care Fund	NO	Funded	£50k - £100k	Implementation	Reduced PM and NO2 from domestic energy sources	Number of properties improved	15 properties improved in 2022/23	£80k limit to the fund. Main issue is finding and engaging eligible people
5	Healthy Homes Assistance Fund	Other	Other	2020	2023	DCC	Better Care Fund	NO	Funded	£100k - £500k	Implementation	Reduced PM and NO2	Number of properties improved	Circa 50 properties improved in 2022/23	£200k limit to the fund. Access to contractors limits delivery
6	Free Trees initiative	Other	Other	2010	2032	SDDC	National Forest	NO	Funded	£10k - 50k	Implementation	CO2 and PM mitigation	Number of free trees distributed	Approx 1000 trees distributed in 2022	
7	Derbyshire Low Emissions Strategy Action Plan	Promoting Low Emission Transport	Priority parking for LEV's	2019	2024	EST, BP Pulse, SDDC	OZEV	NO	Funded	£100k - £500k	Implementation	PM and NO2	Various indicators around increase of low emission transport across Derbyshire	42 EV points in Council owned car parks. Significant growth in demand observed.	
8	Derby Park and Ride scheme at Boulton Moor	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2019	2030	DCC and private developers	Derbyshire County Council and private developers	NO				Reduced passenger car emissions	Trip reductions	Currently at options appraisal	Dependant on s.106 contributions and possible Transforming Cities capital
9	A38 Derby Junction Improvements (Kingsway, Mark Eaton and Abbey Hill)	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2018	2024	Highways England	Highways England	NO	Funded	£1 million - £10 million	Implementation	Reduced total vehicle emissions	None	Development Consent Order approved on 8 January 2021. Re-determination of DCO is currently pending	DCO may not be re-determined
10	South Derbyshire staff travel action plan targets	Promoting Travel Alternatives	Workplace Travel Planning	2019	2024	SDDC	SDDC	NO	Partially Funded	£100k - £500k	Implementation	Reduced PM & NO2	15% reduction in grey fleet mileage. 10% reduction in total fleet diesel consumption. 70% of staff using sustainable travel	Plan adopted in Nov 2019. KPIs for 2022 on target. 50% reduction in staff travel emissions (as CO2) achieved between 2019 and 2022.	Funding and staff engagement

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
11	Derby Clean Air Zone	Traffic Management	Road User Charging (RUC)/ Congestion charging	2019	2024	Derby City Council		YES				Reduced exposure of sensitive receptors	Compliance with EU Limit Value for NO2	Ministerial approval in May 2019	
12	Derbyshire Air Quality Strategy	Other	Other	2019	2030	DCC	DCC	NO	Partially Funded	< £10k	Implementation	Reduced PM & NO2	Various indicators around emissions and exposure reductions	Adopted Jan 2020. Review initiated in 2022. Review draft produced in March 2023.	
13	Derbyshire Cycle Plan	Promoting Travel Alternatives	Promotion of cycling	2019	2030	Active Derbyshire & DCC		NO	Partially Funded		Implementation	Reduced vehicle (PM and NO2) emissions	Increase from 1% to 2% the % of commuters travelling to work by bike as main transport mode	Ongoing	
14	Key Cycle Network	Promoting Travel Alternatives	Promotion of cycling	2019	2030	DCC		NO	Partially Funded			Reduced vehicle (PM and NO2) emissions	Target of 770km of KCN routes	396km complete, 127 proposed links remain	
15	Local Cycling and Walking Infrastructure Plan	Promoting Travel Alternatives	Promotion of walking	2019	2030	Sustrans		NO	Partially Funded			Reduced vehicle (PM and NO2) emissions	Monitored through the Active Lives survey.	Draft Plan submitted to DfT in Nov 2019	
16	Sustainable modes of travel strategy	Promoting Travel Alternatives	School Travel Plans	2019	2030	DCC		NO	Partially Funded			Reduced vehicle (PM and NO2) emissions	Reduce the % of children who go to school in a car from 34%	Proposed KPIs in the Draft Derbyshire AQ Strategy	
17	Sustainable travel Smarter Choices	Promoting Travel Alternatives	Workplace Travel Planning	2019	2030	DCC		NO	Partially Funded					Proposed KPIs in the Draft Derbyshire AQ Strategy	
18	South Derbyshire Cycling Plan	Alternatives to private vehicle use	Other	2019	2030	SDDC		NO	Partially Funded			Reduced vehicle (PM and NO2) emissions	Monitored through the Active Lives survey.	28.9% have used cycling as a means for Active Travel	
19	Reduce emissions from industrial sources by EPR inspections	Environmental Permits	Measures to reduce pollution through IPPC Permits going beyond BAT	2012	2032	SDDC	SDDC	NO	Funded	£10k - 50k	Implementation	Reduced industrial emission of all AQS pollutants	100% compliance with permits	100% compliance in 2022	
20	ISO14001 Accreditation	Promoting Low Emission Plant	Other measure for low emission fuels for stationary and mobile sources	2012	2032	SDDC		NO	Partially Funded	£50k - £100k	Implementation	CO2, PM and NO2	ISO14001 recertification	Recertification acheived in Dec 2022	
21	Greenways Strategy including new greenways and cycle routes	Transport Planning and Infrastructure	Public transport improvements-interchanges stations and services	2012	2032	DCC		NO				CO2, PM and NO3		No data	
22	Develop Supplementary Planning Guidance on Air Quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2016	2022	Public Health England	Regional Local Authorities	NO	Funded	< £10k	Completed	Reduction in impacts of new development	Finalised document	Final version published in Nov 2018	Adoption within the planning process
23	Vehicle Management Strategy and Vehicle Replacement Plan 2016	Vehicle Fleet Efficiency	Other	2018	2023	SDDC	South Derbyshire District Council	NO	Partially Funded	£1 million - £10 million	Implementation	Reduced PM and NO2	TBC	TBC	
24	EMAQF Workplan	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	2018	2023	Public Health England	Regional Local Authorities	NO	Funded	< £10k	Aborted	No direct impact	Delivery against workplan	twice yearly meetings	

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
25	Annual report on air quality to Derbyshire Health Protection Board	Public Information	Via other mechanisms	2018	2032	DCC	District Las	NO	Funded	< £10k	Implementation	No direct impact	Report to Health Protection Board	Last report to the August 2022 meeting	
26	Derbyshire air quality heatmap	Public Information	Via other mechanisms	2020	2020	DCC	District Las	NO	Funded	< £10k	Completed	No direct impact	Finalise heat maps	Heatmaps produced from 2015 data	
27	Promotion of Clean Air Day	Public Information	Via the Internet	2018	2032	DCC	District Las	NO	Funded	< £10k	Implementation	No direct impact	Comm Plan	Comm Plan	
28	improved communication to individuals with chronic health conditions	Public Information	Via other mechanisms	2018	2032	DCC	Derbyshire District / Borough Councils	NO	Not Funded	£10k - 50k	Planning	Reduced exposure of sensitive receptors	TBC	No specific plans developed	
29	Increase awareness of impacts of air quality on health across professional groups	Public Information	Via other mechanisms	2018	2032	DCC	NHS	NO	Not Funded	£10k - 50k	Planning	Reduced exposure of sensitive receptors	TBC	The Draft Derbyshire AQ Strategy has been produced following key stakeholder consultation	
30	Installation of a continuous PM monitor in South Derbyshire	Public Information	Via the Internet	2018	2032	SDDC	SDDC	NO	Funded	£10k - 50k	Implementation	No direct reductions	90% capture of PM10 & PM2.5 data	Monitor installed in Sept 2019	Technical problems with monitor
31	EPC compliance in private rented sector	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources	2019	2022	SDDC	SDDC	NO	Funded	£10k - 50k	Implementation	Reduced fixed plant (PM and NO2) emissions	100% to EPC E	99.8% at EPC E	
32	South Derbyshire Climate & Environment Action Plan														
32a	Action T1	Promoting Low Emission Plant	Low Emission Fuels for stationary and mobile sources in Public Procurement	2021	2030	SDDC	SDDC	NO	Not Funded	£1 million - £10 million	Planning	Reduced fixed plant (PM and NO2) emissions	200 tonne carbon reduction	Approved in principle	No funding
32b	Action T2	Promoting Low Emission Plant	Low Emission Fuels for stationary and mobile sources in Public Procurement	2021	2030	SDDC	SDDC	NO	Not Funded	£500k - £1 million	Planning	Reduced fixed plant (PM and NO2) emissions	589 tonne carbon reduction	Approved in principle	No funding
32c	Action T3	Promoting Low Emission Plant	Low Emission Fuels for stationary and mobile sources in Public Procurement	2021	2030	SDDC	SDDC	NO	Not Funded	£100k - £500k	Planning	Reduced fixed plant (PM and NO2) emissions	590 tonne carbon reduction	Approved in principle	No funding
32d	Action T4	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	2021	2030	SDDC	SDDC	NO	Not Funded	£1 million - £10 million	Planning	Reduced vehicle (PM and NO2) emissions	381 tonne carbon reduction	Approved in principle	No funding
32e	Action T5	Promoting Low Emission Plant	Low Emission Fuels for stationary and mobile sources in Public Procurement	2021	2030	SDDC	SDDC	NO	Not Funded	£100k - £500k	Planning	Reduced fixed plant (PM and NO2) emissions	42 tonne carbon reduction	Approved in principle	No funding
32f	Action T6	Promoting Low Emission Plant	Low Emission Fuels for stationary and mobile sources in Public Procurement	2021	2030	SDDC	SDDC	NO	Not Funded	£100k - £500k	Planning	Reduced fixed plant (PM and NO2) emissions	136 tonne carbon reduction	Approved in principle	No funding
32g	Action T7 & T8	Promoting Low Emission Plant	Other measure for low emission fuels for stationary and mobile sources	2021	2030	SDDC	SDDC	NO	Not Funded	> £10 million	Planning	Reduced fixed plant (PM and NO2) emissions	>1000 tonne carbon reduction	Approved in principle	No funding

Measure No.	Measure	Category	Classification	Year Measure Introduced	Estimated / Actual Completion Year	Organisations Involved	Funding Source	Defra AQ Grant Funding	Funding Status	Estimated Cost of Measure	Measure Status	Reduction in Pollutant / Emission from Measure	Key Performance Indicator	Progress to Date	Comments / Barriers to Implementation
32h	Action ISP19	Freight and Delivery Management	Other	2021	2032	SDDC	TBD	NO	Not Funded	> £10 million	Planning	Reduced fixed plant and vehicle (PM and NO2) emissions	TBD	TBD	No funding
32i	Action DSP6	Promoting Low Emission Transport	Other	2021	2032	SDDC	TBD	NO	Not Funded	> £10 million	Planning	Reduced vehicle (PM and NO2) emissions	TBD	TBD	No funding
32j	Action DSP13	Promoting Low Emission Transport	Other	2021	2032	SDDC	TBD	NO	Not Funded	£50k - £100k	Planning	Reduced vehicle (PM and NO2) emissions	TBD	TBD	No funding
32k	Action DSP4	Promoting Low Emission Plant	Low Emission Fuels for stationary and mobile sources in Public Procurement	2021	2023	SDDC	BEIS / MEH	NO	Funded	£1 million - £10 million	Implementation	Reduced domestic (PM and NO2) emissions	700 residential properties with reduced energy demand	On Target	
32l	Action ISP8	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources	2021	2023	SDDC	SDDC	NO	Funded	£100k - £500k	Implementation	Reduced mobile plant (PM and NO2) emissions	10 tonne carbon reduction	On Target	
33	Real time traffic emissions reporting and app	Traffic Management	UTC, Congestion management, traffic reduction	2022	2023	DCC, AECOM	DEFRA	YES	Funded	£100k - £500k	Planning	Reduced moving vehicle (PM and NO2) emissions	No metrics as yet	Currently at project development stage	
34	Beat the Streets	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	2022	2023	SDDC	SDDC	NO	Funded	£10k - 50k	Implementation	Reduced vehicle (PM and NO2) emissions	No metrics as yet	5,264 players have signed up in the first two weeks	

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 1), 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 Outcomes Framework (PHOF) is a Department of Health data tool for England, intended to focus public health action on increasing healthy life expectancy and reducing differences in life expectancy between communities. The tool uses indicators to assess improvements. Recognising the significant impact that poor air quality can have on health, the PHOF includes an indicator relating to fine particulate matter ($PM_{2.5}$).

The indicator in the PHOF reports the estimates fraction of all-cause adult mortality attributable to anthropogenic particulate air pollution (measured as fine particulate matter). Based on the latest available figures the position in South Derbyshire can be compared to the situation across the rest of England. This comparison is summarised in Table 2.2.

Table 2.2 Fraction of mortality attributable to particulate air pollution

England Average	England Lowest	England Highest	East Midlands Average	Derbyshire Average	South Derbyshire
5.3%	3.5%	7.9%	5.6%	5.4%	5.4%

The estimated sources of $PM_{2.5}$ in South Derbyshire have been calculated from background air quality data published by DEFRA. The DEFRA data consists of estimated background concentrations of $PM_{2.5}$ in each 1×1km grid square across all of South Derbyshire attributable to all of the main sources. The estimated average concentration across all 340km^2 and the maximum estimated concentration (expressed in milligrams per cubic metre, µg/m^3) from each of the main sources of are presented in Table 2.3.

Table 2.3 Summary of the Average and Maximum Concentrations of $PM_{2.5}$ in South Derbyshire by 1×1km squares (2022 predictions)

Source	Average Concentration µgm^3	Proportion of the total $PM_{2.5}$	Maximum Concentration µgm^3
Motorway	0.000	0.00%	0.010
Trunk A	0.004	0.06%	0.041
Primary A	0.001	0.02%	0.009
Minor	0.003	0.04%	0.012
Brake and Tyre	0.025	0.34%	0.102
Road Abrasion	0.013	0.18%	0.061
Industry	0.124	1.72%	1.472
Domestic	0.152	2.11%	0.731
Rail	0.010	0.14%	0.078
Other	0.038	0.52%	0.424
Secondary	4.305	59.72%	4.517
Residual and salt	2.393	33.20%	3.492
Point sources	0.140	1.95%	2.017

South Derbyshire is not currently taking any additional specific measures to address $PM_{2.5}$ beyond those already described in this report.

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

This section sets out the monitoring undertaken within South Derbyshire in 2022 and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2018 and 2022 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

South Derbyshire District Council does not undertake any continuous air quality monitoring.

3.1.2 Non-Automatic Monitoring Sites

South Derbyshire District Council undertook non- automatic (i.e. passive) monitoring of NO_2 at twenty-four (24) sites during 2022. Table A.2 in Appendix A presents the details of the non-automatic sites. There has been no change in the number of monitoring locations since the 2022 Annual Status Report.

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 (where the annual mean data capture is below 75% and greater than 25%), and distance correction. Further details on adjustments are provided in Appendix C.

3.2.1 Nitrogen Dioxide (NO_2)

Table A.3 and Table A.4 in Appendix A compare the ratified and adjusted monitored NO_2 annual mean concentrations for the past five years with the air quality objective of 40µg/m^3. Note that the concentration data presented represents the concentration at the location of the monitoring site, following the application of bias adjustment and annualisation, as required (i.e. the values are exclusive of any consideration to fall-off with distance adjustment).

For diffusion tubes, the full 2022 dataset of monthly mean values is provided in Appendix B. Note that the concentration data presented in Table B.1 includes distance corrected values, only where relevant.

3.2.2 Particulate Matter (PM_{10})

No monitoring of PM_{10} was carried out by South Derbyshire District Council during 2022.

3.2.3 Particulate Matter ($PM_{2.5}$)

No monitoring of $PM_{2.5}$ was carried out by South Derbyshire District Council during 2022.

3.2.4 Sulphur Dioxide (SO_2)

No monitoring of SO_2 was carried out by South Derbyshire District Council during 2022.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

South Derbyshire does not currently carry out automatic monitoring of air quality.

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

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
SDDC1	Findern Lane, Burnaston	Roadside	430040	331110	NO_2	No	30	2.0	No	1.5
SDDC2	27 High Street, Woodville	Roadside	431570	319130	NO_2	No	0	4.0	No	1.5
SDDC3	Community Centre, Church Gresley	Urban Background	429300	318620	NO_2	No	0	20.0	No	1.5
SDDC4	Castle Apartments, Station Road, Hatton	Roadside	421480	329630	NO_2	No	10	1.5	No	1.5
SDDC5	24 High Street, Woodville	Kerbside	431572	319106	NO_2	No	0	1.0	No	1.5
SDDC6	Woody's, 8 High Street, Woodville	Roadside	431540	319143	NO_2	No	0	4.0	No	1.5
SDDC7	The Robin Hood Inn, Lullington Road, Overseal	Roadside	429460	315420	NO_2	No	0	2.0	No	1.5
SDDC8	1 Lullington Road, Overseal	Roadside	429467	315395	NO_2	No	0	30.0	No	1.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
SDDC9	99 Woodland Road, Stanton	Roadside	427000	319840	NO_2	No	0	3.0	No	1.5
SDDC10	160 Burton Road, Castle Gresley	Kerbside	427622	318878	NO_2	No	5	1.0	No	1.5
SDDC11	Library, Hartshorne Road, Woodville	Roadside	431500	319250	NO_2	No	0	15.0	No	1.5
SDDC12	32 High Street Repton	Roadside	430494	326810	NO_2	No	0	3.0	No	1.5
SDDC13	35/37 High Street Repton	Roadside	430508	326810	NO_2	No	0	1.5	No	1.5
SDDC14	The Priory, High St, Repton	Kerbside	430444	326888	NO_2	No	0	1.0	No	1.5
SDDC15	2 Woods Meadow, Chellaston Lane	Roadside	439886	332070	NO_2	No	0	1.5	No	1.5
SDDC16	25-39 Hepworth Road	Roadside	431154	318450	NO_2	No	0	1.5	No	1.5
SDDC17	165 High Street, Woodville	Roadside	432100	318752	NO_2	No	0	2.0	No	1.5
SDDC18	2a Repton Road, Willington	Roadside	430693	331831	NO_2	No	0	1.5	No	1.5
SDDC19	9 Church Street, Church Gresley	Roadside	429704	318343	NO_2	No	0	2.0	No	1.5
SDDC20	15 Swadlincote Road, Woodville	Roadside	431294	319204	NO_2	No	0	1.5	No	1.5
SDDC21	39 Moira Road, Woodville	Roadside	431487	319003	NO_2	No	0	1.5	No	1.5
SDDC22	12 Silverton Drive	Roadside	433236	330729	NO_2	No	0	2.0	No	1.5
SDDC23	46 Deepdale Lane	Roadside	434558	330471	NO_2	No	0	2.0	No	1.5

Diffusion Tube ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA? Which AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube Co-located with a Continuous Analyser?	Tube Height (m)
SDDC24	59 Station Road, Hatton	Roadside	421591	330015	NO_2	No	0	1.5	No	1.5

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.3 – Annual Mean NO_2 Monitoring Results: Automatic Monitoring (µg/m^3)

South Derbyshire does not currently carry out automatic monitoring of air quality.

Table A.4 – Annual Mean NO_2 Monitoring Results: Non-Automatic Monitoring (µg/m^3)

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
SDDC1	430040	331110	Roadside	100	100.0	21.7	20.7	16.5	17.5	17.5
SDDC2	431570	319130	Roadside	92.3	92.3	26.9	25.6	22.6	24.8	21.7
SDDC3	429300	318620	Urban Background	100	100.0	12.8	11.3	9.2	9.6	9.8
SDDC4	421480	329630	Roadside	82.7	82.7	22.4	19.5	19.1	20.4	20.5
SDDC5	431572	319106	Kerbside	100	100.0	26.8	24.3	19.6	19.9	19.8
SDDC6	431540	319143	Roadside	92.3	92.3	33.7	32.7	23.5	23.4	24.1
SDDC7	429460	315420	Roadside	100	100.0	25.7	23.3	19.8	19.9	21.7
SDDC8	429467	315395	Roadside	92.3	92.3	26.8	23.5	19.8	22.1	22.8
SDDC9	427000	319840	Roadside	100	100.0	31.4	32.3	24.8	26.1	24.5
SDDC10	427622	318878	Kerbside	84.6	84.6	32.7	29.0	24.8	27.7	26.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) [1]	Valid Data Capture 2022 (%) [2]	2018	2019	2020	2021	2022
SDDC11	431500	319250	Roadside	100	100.0	29.3	26.8	22.5	21.6	25.2
SDDC12	430494	326810	Roadside	92.3	92.3	19.8	18.1	13.9	14.8	15.2
SDDC13	430508	326810	Roadside	92.3	92.3	19.2	17.2	14.4	15.0	15.1
SDDC14	430444	326888	Kerbside	90.4	90.4	30.6	27.7	21.1	24.0	24.5
SDDC15	439886	332070	Roadside	76.9	76.9				16.3	16.2
SDDC16	431154	318450	Roadside	100	100.0				14.0	14.8
SDDC17	432100	318752	Roadside	92.3	92.3	32.1	27.8	24.7	28.0	25.1
SDDC18	430693	331831	Roadside	100	100.0	31.3	24.8	22.3	25.6	24.9
SDDC19	429704	318343	Roadside	100	100.0	23.4	24.8	17.0	17.4	17.4
SDDC20	431294	319204	Roadside	100	100.0				20.4	21.5
SDDC21	431487	319003	Roadside	92.3	92.3				17.1	17.7
SDDC22	433236	330729	Roadside	92.3	92.3					19.1
SDDC23	434558	330471	Roadside	76.9	76.9					15.9

Diffusion Tube ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2022 (%) (2)	2018	2019	2020	2021	2022
SDDC24	421591	330015	Roadside	84.6	84.6					18.8

☒ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG16.**

☒ **Diffusion tube data has been bias adjusted.**

☒ **Reported concentrations are those at the location of the monitoring site (bias adjusted and annualised, as required), i.e. prior to any fall-off with distance correction.**

Notes:

The annual mean concentrations are presented as µg/m^3.

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**.

Means for diffusion tubes have been corrected for bias. All means have been "annualised" as per LAQM.TG22 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Concentrations are those at the location of monitoring and not those following any fall-off with distance adjustment.

(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%).

The DEFRA Diffusion Tube Data Processing Tool has been used to process all the data and the data was subsequently submitted via the LAQM reporting portal.

There have been no exceedances of the NO_2 annual mean objective of 40µg/m^3 in any of the last five calendar years.

There have been no NO_2 annual means exceeding 60µg/m^3, which would strongly suggest that there have been no potential exceedance of the NO_2 1-hour mean objective.

Trends in Annual Mean NO_2 Concentrations

This section of the report provides data and commentary on air quality trends over recent years.

Eleven sites have been monitored using diffusion tubes since 2011 (i.e. 12 years of data). Based on a linear regression calculation, all of these sites are shown to have improved over this time period.

A further six sites have been monitored using diffusion tubes since 2012 (i.e. 11 years of data). Based on a linear regression calculation, all of these sites are also shown to have improved over this time period.

To illustrate the long-term reduction in measured NO_2 at these seventeen monitoring locations, the average (mean) of all of the annual NO_2 measurements across all of these sites is illustrated in Figure A.1

Figure A.1

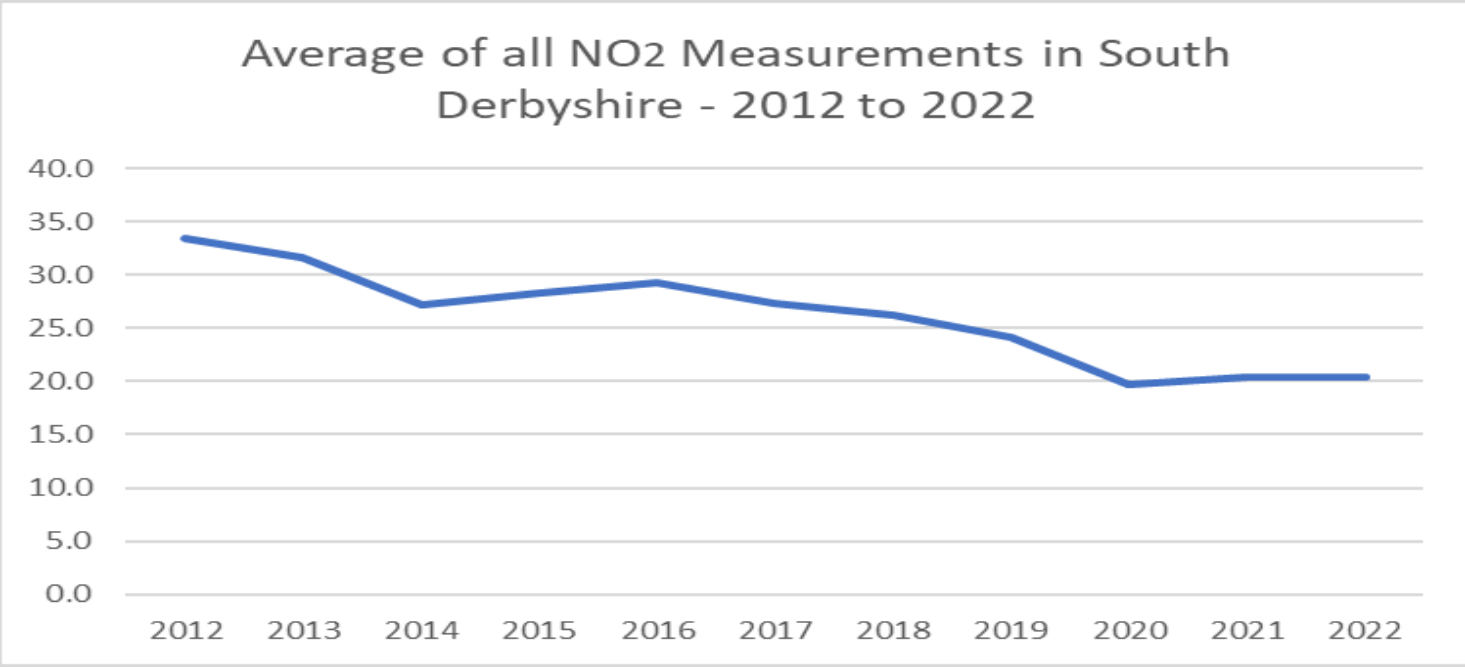


Figure A.1 shows that there has been a consistent downward trend in the overall measured average across South Derbyshire since 2012.

The lowest averaged measurement was in 2020, which was when traffic movement on the local road network was significantly reduced due to the Covid-19 pandemic and the implications of lock-down restrictions.

Traffic volumes are understood to have largely returned back to pre-pandemic levels during 2022. It is very encouraging to observe that there does not appear to have been a significant increase in measured NO_2 during 2022 when comparing against 2020 and 2021.

The maximum and minimum measured NO_2 at each of these seventeen sites along with the year in which the maximum and minimum measured NO_2 were observed are shown in Table A.5.

Table A.5 Maximum and Minimum Measured NO_2 Recorded Between 2011 to 2022

Monitoring Site	Maximum Measured NO_2	Year	Minimum Measured NO_2	Year
SDDC1	30.6	2013	16.5	2020
SDDC2	37.3	2014	21.7	2022
SDDC3	20.0	2013	9.2	2020
SDDC4	27.5	2012	19.1	2020
SDDC5	38.3	2012	19.6	2021
SDDC6	43.5	2012	23.4	2020

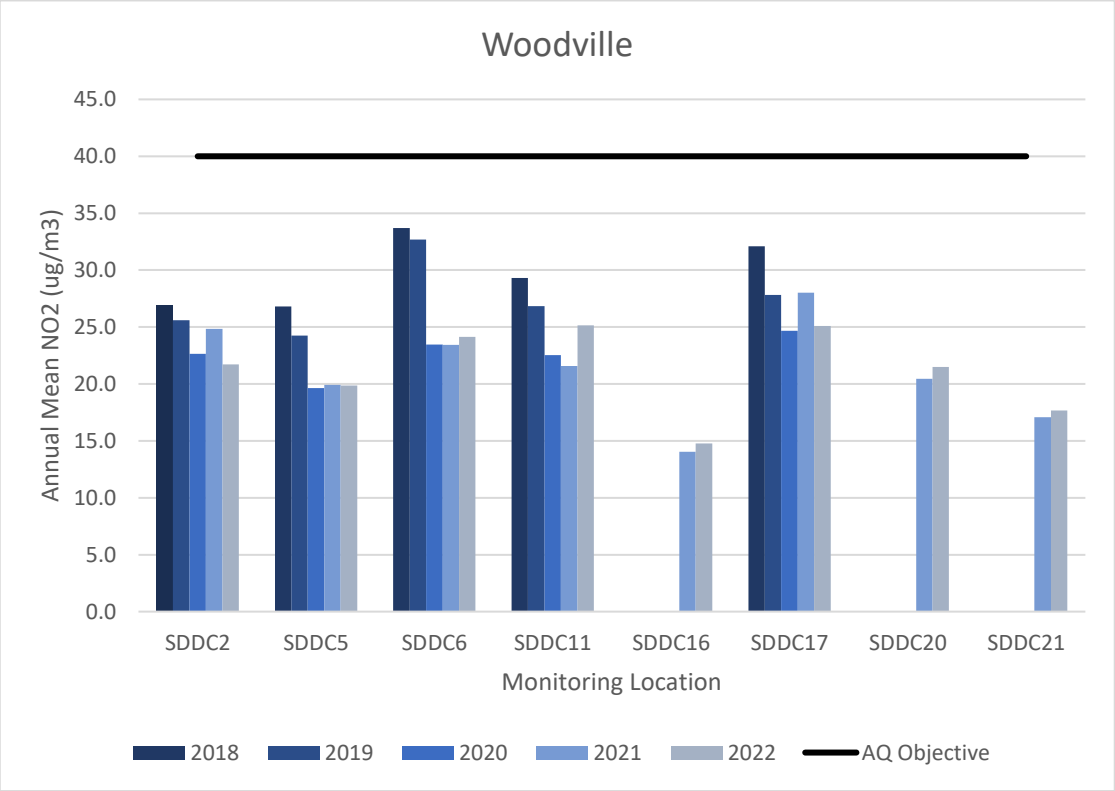
SDDC7	29.4	2013	19.8	2022
SDDC8	32.2	2011	19.8	2020
SDDC9	32.9	2013	24.5	2021
SDDC10	35.4	2017	24.8	2020
SDDC11	33.7	2016	21.6	2020
SDDC12	31.2	2012	13.9	2020
SDDC13	30.9	2012	14.4	2020
SDDC14	46.4	2012	21.1	2020
SDDC17	51.9	2012	24.7	2020
SDDC18	40.0	2012	22.3	2020
SDDC19	31.9	2012	17.0	2020

Table A.5 shows that the highest measured levels of NO_2 in South Derbyshire have predominantly been in the period 2012 to 2013. It also shows that all of the lowest measured levels of NO_2 in South Derbyshire were in the period 2020 to 2022.

Woodville

Historically, the highest measured levels of NO_2 have been observed in Woodville, and in particular along A511, Woodville High Street. Air quality data for the last five years in Woodville are shown in Figure A.2.

Figure A.2



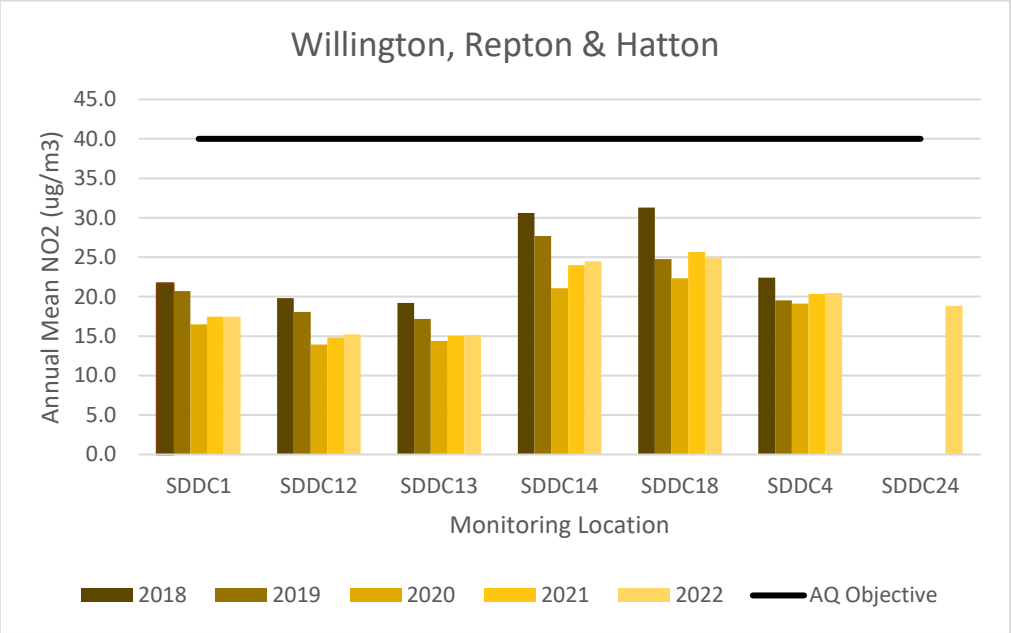
All long-term monitoring locations along the A512 in Woodville show a pronounced downward trend in the last five years.

The more recently commissioned monitoring locations in Woodville were selected to monitor the impact of the opening of the Woodville – Swadlincote Regeneration route. Data from all three of these locations (SDDC16, SDDC 20 and SDDC 21) show that air quality at locations most likely to be adversely affected by the route is well below the AQ Objective.

Willington, Repton and Hatton

Air quality data for the last five years in Willington, Repton and Hatton are shown in Figure A.3.

Figure A.3



Historically, air quality in Repton, and in particular along the narrow Main Street (B5008) has been of concern and resulted in a detailed assessment in 2015. Monitoring data from the three retained monitoring sites in Repton (SDDC12, SDDC13 and SDDC14) all show that the Air Quality Objective has been consistently achieved and all show a downward trend in the measured annual average.

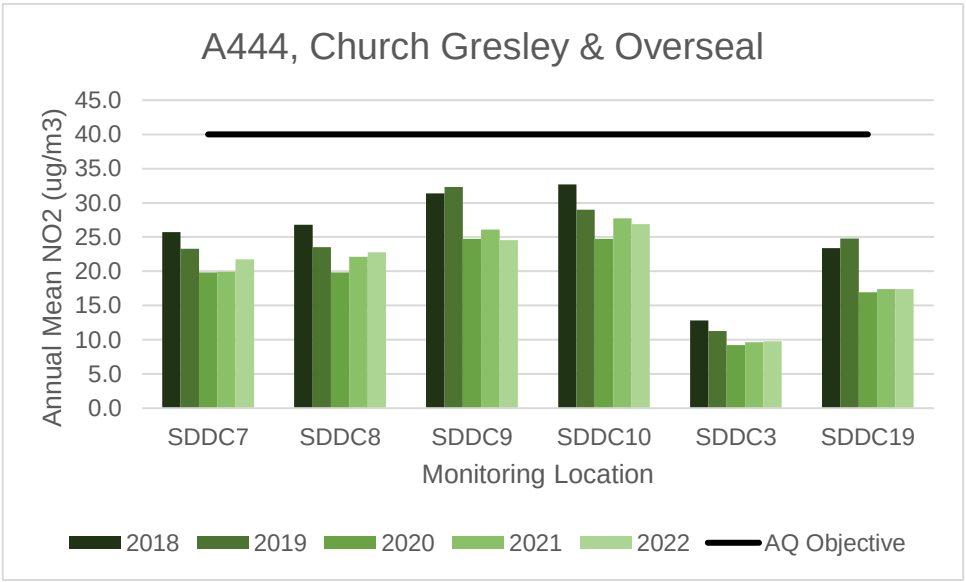
Air quality at one monitoring location at Station Road in Hatton (A511) has consistently been below the Air Quality Objective (SDDC4). Following the addition of another monitoring location further to the north of Station Road, early data shows that this is also well below the AQO. There appears to be a long-term downward trend in NO_2 in Hatton, although this is weaker downward trend than that observed a most of the other monitoring locations in the District.

Air quality in the centre of Willington (SDDC18) and along the A38, north of its junction with the A50 (SDDC1) has consistently been below the AQO.

A444, Church Gresley and Overseal

Air quality data for the last five years along the A444 and in Church Gresley and Overseal are shown in Figure A.4.

Figure A.4



Historically, air quality in Overseal, and in particular at the crossroads with the A444 in the centre of the village has been of concern and resulted in a detailed air quality assessment in 2010. Monitoring data from the two retained monitoring sites in Overseal (SDDC7 and SDDC8) show that the Air Quality Objective has been consistently achieved and all show a small downward trend in the measured annual average over the last five years.

Air quality at two locations along the A444 (SDDC9 and SDDC10) have consistently been below the Air Quality Objective and show a small downward trend.

Similarly, air quality at two locations in Church Gresley (SDDC3 and SDDC19) have consistently been below the Air Quality Objective and show a small downward trend.

Stenson and Boulton Moor

New air quality monitoring locations have recently been established in Boulton Moor (SDDC15) and Stenson (SDDC23 and SDDC24) in response to the potential impacts from significant new areas of residential development and therefore potential extra traffic emissions. It is too early to produce any trend data from these three sites, however initial data shows that air quality at all three locations are well below the AQO.

Table A.5 – Annual Mean PM_{10} Monitoring Results ($\mu g/m^3$)

No monitoring of PM_{10} was carried out in 2022.

Table A.6 – Annual Mean $PM_{2.5}$ Monitoring Results ($\mu g/m^3$)

No monitoring of $PM_{2.5}$ was carried out in 2022.

Table A.7 – SO_2 2020 Monitoring Results, Number of Relevant Instances

No monitoring of SO_2 was carried out in 2022.

Appendix B: Full Monthly Diffusion Tube Results for 2022

Table B.1 – NO_2 2022 Diffusion Tube Results (µg/m^3)

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
SDDC 1	430040	331110	27.7	28.2	34.0	20.8		15.6	16.7	18.8	19.3	25.4	21.2	24.9	23.0	17.5	N/A	
SDDC 2	431570	319130	39.5	24.5	36.0	30.0	24.3	23.1	26.8		28.5	21.5	27.7	32.3	28.6	21.7	N/A	
SDDC 3	429300	318620	22.2	15.5	15.5	11.3	8.4	7.8	8.1	10.4	11.3	12.2	13.3	18.4	12.9	9.8	N/A	
SDDC 4	421480	329630	29.2	23.7	31.7	26.9			22.4	27.4	26.4	26.3	27.3	28.2	27.0	20.5	N/A	
SDDC 5	431572	319106	**42.0**	23.5	26.9	30.2	24.1	24.8	27.0	23.5	25.9	22.1	23.8	19.6	26.1	19.8	N/A	
SDDC 6	431540	319143	**49.0**	32.2	33.7	23.9	30.3	31.4		27.0	31.7	27.9	31.9	30.3	31.8	24.1	N/A	
SDDC 7	429460	315420	38.4	25.0	36.2	29.4	37.9	21.4	23.9	28.7	27.5	25.3	19.1	30.5	28.6	21.7	N/A	
SDDC 8	429467	315395	39.0	23.0	40.3	29.5	24.5		23.7	28.7	27.8	27.7	28.8	36.5	30.0	22.8	N/A	
SDDC 9	427000	319840	**46.8**	31.9	**40.9**	25.1	27.7	29.0	29.4	26.9	34.0	32.9	27.6	35.3	32.3	24.5	N/A	
SDDC 10	427622	318878	**51.2**			31.1	31.6	31.0	32.6	36.4	35.1	30.1	**40.3**	34.6	35.4	26.9	N/A	
SDDC 11	431500	319250	**42.8**	31.8	36.4	29.8	29.7	28.8	29.3	31.8	30.4	32.4	35.1	38.9	33.1	25.2	N/A	
SDDC 12	430494	326810	28.7	20.7		17.4	14.3	15.2	16.2	17.8	18.1	19.7	25.2	26.9	20.0	15.2	N/A	
SDDC 13	430508	326810	31.7	19.6		20.4	16.3	14.5	16.7	21.2	18.4	15.3	21.0	24.1	19.9	15.1	N/A	
SDDC 14	430444	326888	**46.8**	32.7	38.7	30.0		26.7	27.6	27.8	31.4	24.8	30.8	37.1	32.2	24.5	N/A	
SDDC 15	439886	332070	28.7	24.8		20.8	16.9	15.6	15.5	20.9		21.9		27.2	21.4	16.2	N/A	
SDDC 16	431154	318450	25.8	17.7	28.1	16.6	15.4	14.1	17.4	16.5	21.6	21.5	14.1	24.6	19.5	14.8	N/A	
SDDC 17	432100	318752	**47.5**	28.1		35.6	30.6	29.2	30.3	38.4	35.2	34.6	18.0	35.8	33.0	25.1	N/A	
SDDC 18	430693	331831	**45.5**	33.8	39.5	33.0	29.8	29.4	31.7	34.0	28.8	27.1	27.3	33.0	32.7	24.9	N/A	
SDDC 19	429704	318343	34.1	20.6	25.5	21.8	20.0	17.1	20.0	20.7	21.2	19.7	26.2	27.9	22.9	17.4	N/A	
SDDC 20	431294	319204	**43.3**	28.4	36.2	24.7	22.5	20.6	22.9	22.4	25.0	25.4	32.2	35.7	28.3	21.5	N/A	

DT ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Easting)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Mean: Raw Data	Annual Mean: Annualised and Bias Adjusted (0.76)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
SDDC 21	431487	319003	34.3	24.7		22.1	17.1	15.5	18.6	22.1	21.1	25.2	25.1	30.0	23.3	17.7	N/A	
SDDC 22	433236	330729		24.9	35.1	21.3	20.5	24.5	21.8	22.4	22.6	27.8	23.0	32.1	25.1	19.1	N/A	
SDDC 23	434558	330471		24.7		22.8	19.8	16.1	16.8	17.4	20.8	22.4		27.7	20.9	15.9	N/A	
SDDC 24	421591	330015		31.5	34.8	22.8	20.1	18.3	17.7	18.8	24.8	25.5		33.4	24.8	18.8	N/A	

☒ **All erroneous data has been removed from the NO_2 diffusion tube dataset presented in Table B.1.**

☐ **Annualisation has been conducted where data capture is <75% and >25% in line with LAQM.TG22.**

☐ **Local bias adjustment factor used.**

☒ **National bias adjustment factor used.**

☐ **Where applicable, data has been distance corrected for relevant exposure in the final column.**

☒ **SDDC confirm that all 2022 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.**

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**.

See Appendix C for details on bias adjustment and annualisation.

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

New or Changed Sources Identified Within South Derbyshire During 2022

South Derbyshire District Council has not identified any new sources relating to air quality within the reporting year of 2022.

Additional Air Quality Works Undertaken by South Derbyshire District Council During 2022

South Derbyshire District Council has not completed any additional works within the reporting year of 2022.

QA/QC of Diffusion Tube Monitoring

Diffusion tubes used for non-automatic monitoring of NO_2 are supplied by Environmental Science, Unit 12, Moorbrook, South Mead Industrial Estate, Didcot, Oxfordshire, OX11 7HP (formerly known as Socotec).

The samples were analysed in accordance with SOCOTEC's standard operating procedure ANU/SOP/1015. This method meets the guidelines set out in DEFRA's 'Diffusion Tubes for Ambient NO_2 Monitoring: Practical Guidance.' The tubes were prepared by spiking acetone : triethanolamine (50:50) onto the grids prior to the tubes being assembled. The tubes were desorbed with distilled water and the extract analysed using a segmented flow auto analyser with ultraviolet detection.

This analysis of diffusion tube samples to determine the amount of nitrogen dioxide present on the tube is within the scope of Socotec UKAS schedule. In the AIR PT intercomparison scheme for comparing spiked Nitrogen Dioxide diffusion tubes, SOCOTEC currently holds the highest rank of a **Satisfactory** laboratory.

The monitoring was completed in adherence with the DEFRA 2022 Diffusion Tube Monitoring Calendar.

Diffusion Tube Annualisation

All diffusion tube monitoring locations within South Derbyshire recorded data capture of ≥75% therefore it was not required to annualise any monitoring data.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2022 ASR have been corrected for bias using an adjustment factor. Bias represents the overall tendency of the diffusion tubes to under or over-read relative to the reference chemiluminescence analyser. LAQM.TG22 provides guidance about the application of a bias adjustment factor to correct diffusion tube monitoring. Triplicate co-location studies can be used to determine a local bias factor based on the comparison of diffusion tube results with data taken from NO_x/NO_2 continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

South Derbyshire District Council have applied a national bias adjustment factor of 0.76 to the 2022 monitoring data. A summary of bias adjustment factors used by South Derbyshire over the past five years is presented in Table C.1.

The national bias correction factors used have been taken from spreadsheet version 03/23.

The overall bias correction factor in 2022 is based on data from 26 studies.

Table C.1 – Bias Adjustment Factor

Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2022	National	03/23	0.76
2021	National	03/22	0.78
2020	National	03/21	0.77
2019	National	03/20	0.75
2018	National	03/19	0.76

NO_2 Fall-off with Distance from the Road

Wherever possible, local authorities should ensure that monitoring locations are representative of exposure. However, where this is not possible, the NO_2 concentration at the nearest location relevant for exposure should be estimated using the Diffusion Tube

Data Processing Tool/NO_2 fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-automatic annual mean NO_2 concentrations corrected for distance are presented in Table B.1.

DEFRA guidance recommends that distance correction should be considered at any monitoring site where the annual mean concentration is greater than 36µg/m^3 and the monitoring site is not located at a point of relevant exposure.

No diffusion tube NO_2 monitoring locations within South Derbyshire required distance correction during 2022.

QA/QC of Automatic Monitoring

No automatic monitoring carried out in 2022.

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

Figure D.1 – Map of Non-Automatic Monitoring Site

Figure D.1a District Map of All Non-Automatic Monitoring Sites in South Derbyshire

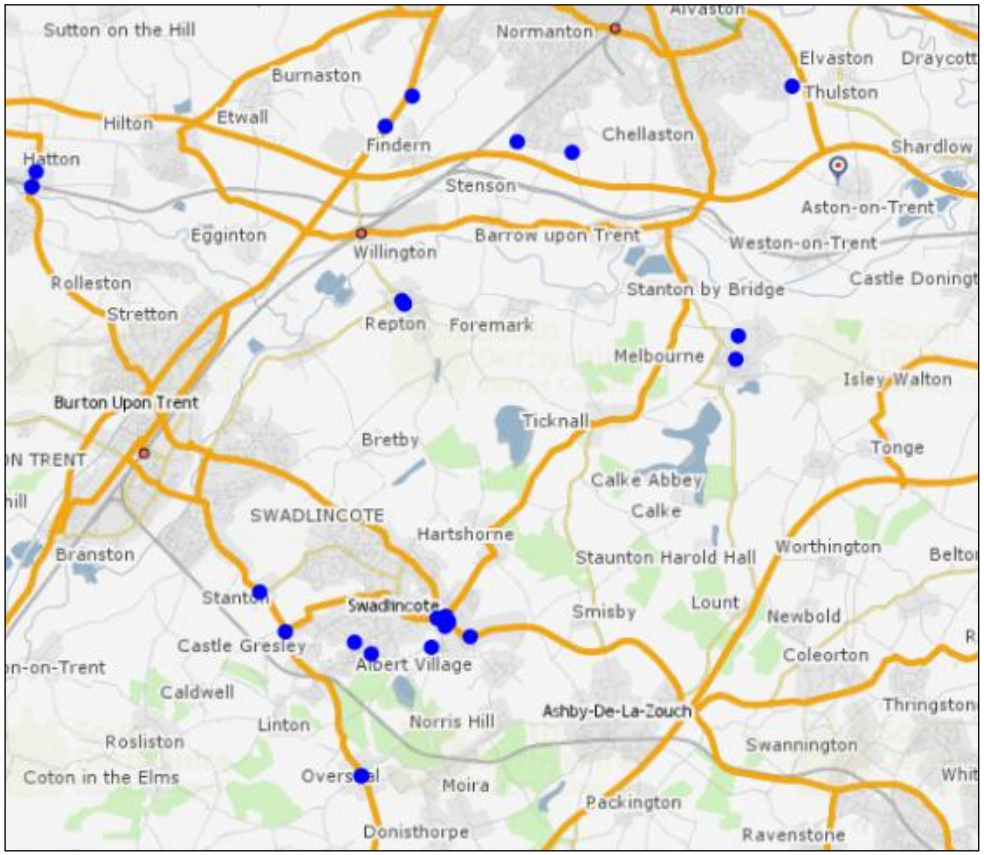


Figure D.1b Map of Non-Automatic Monitoring Sites in Woodville

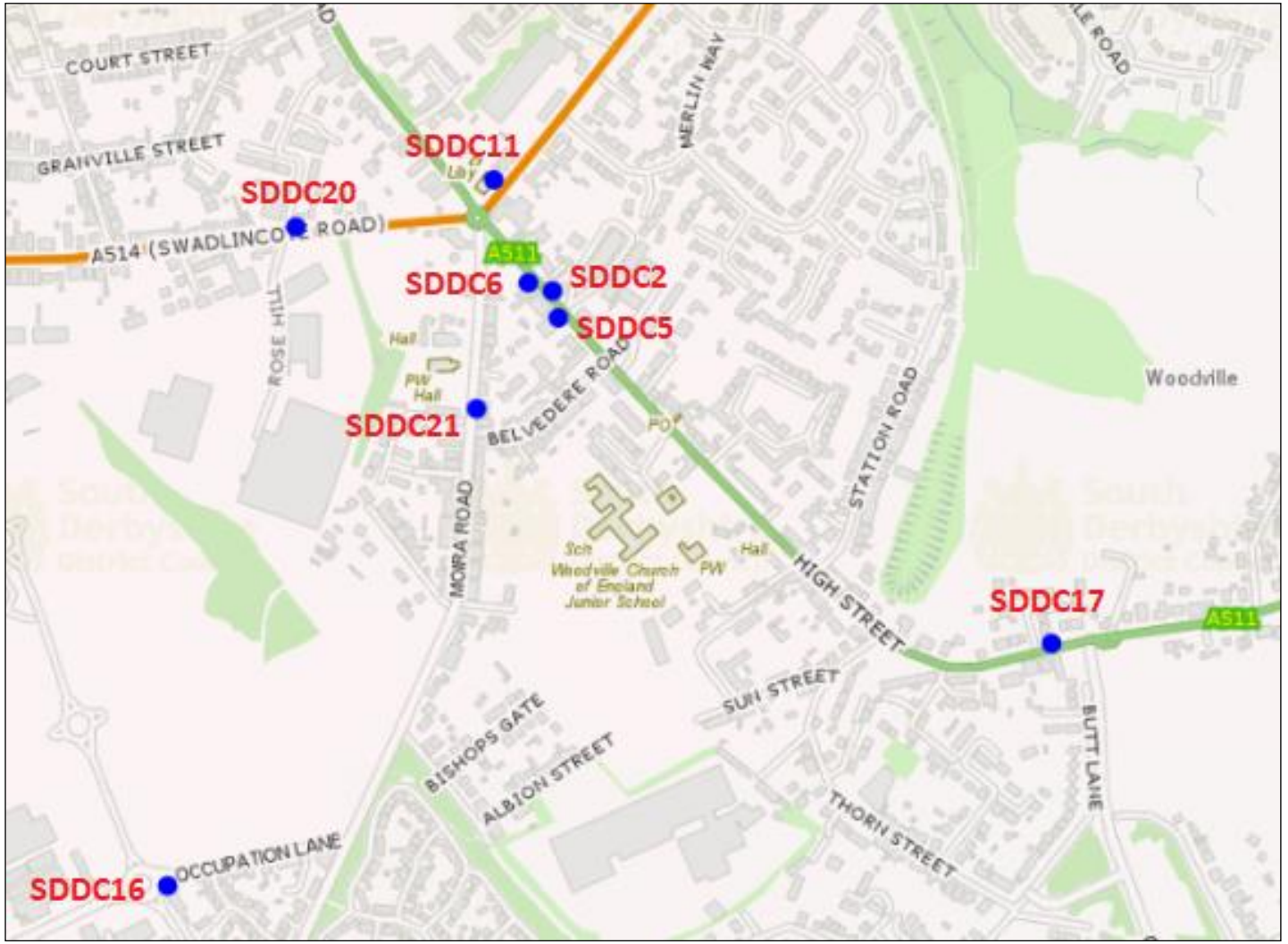


Figure D.1c Map of Non-Automatic Monitoring Site in Burnaston (SDDC1)

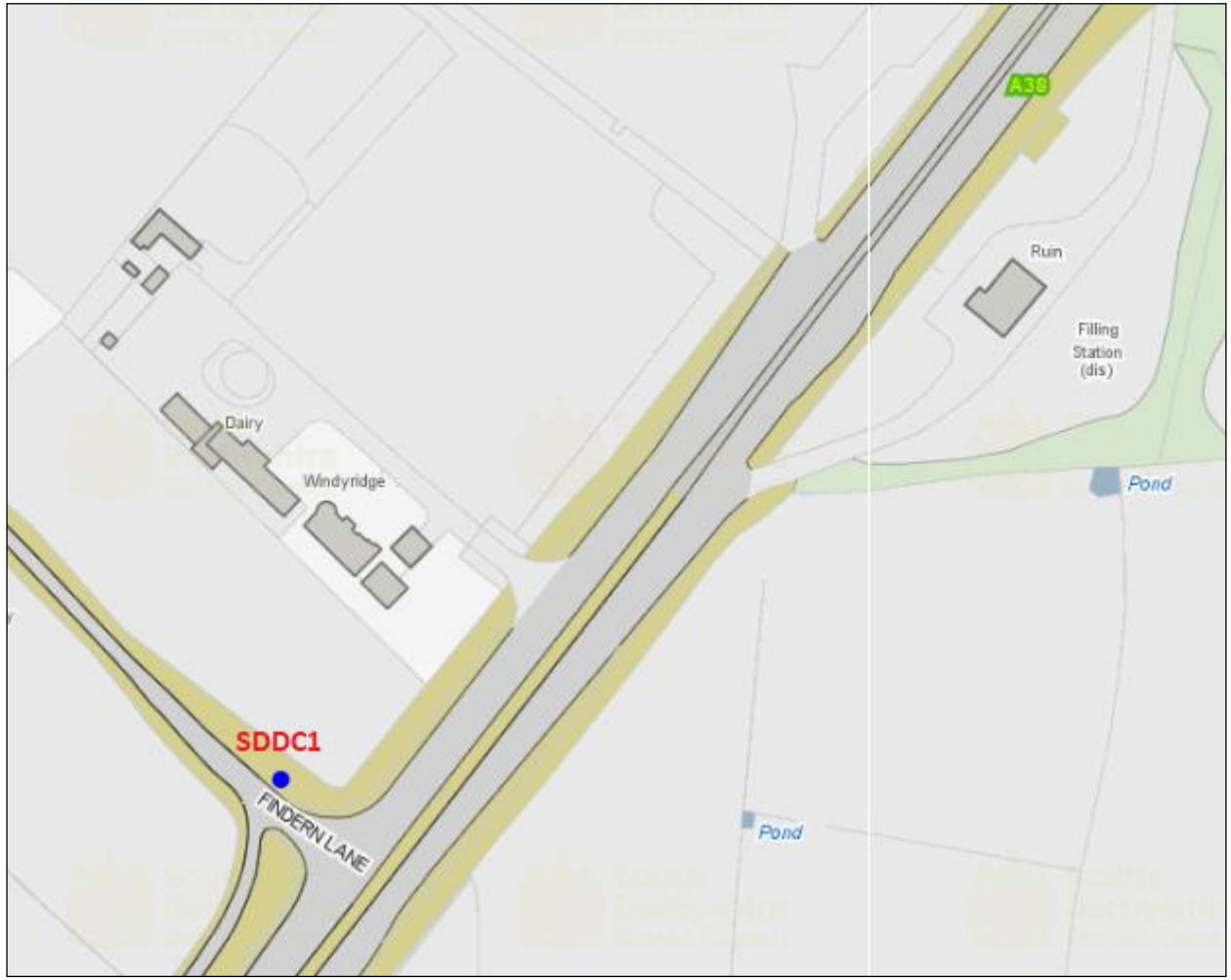


Figure D.1d Map of Non-Automatic Monitoring Site in Hatton

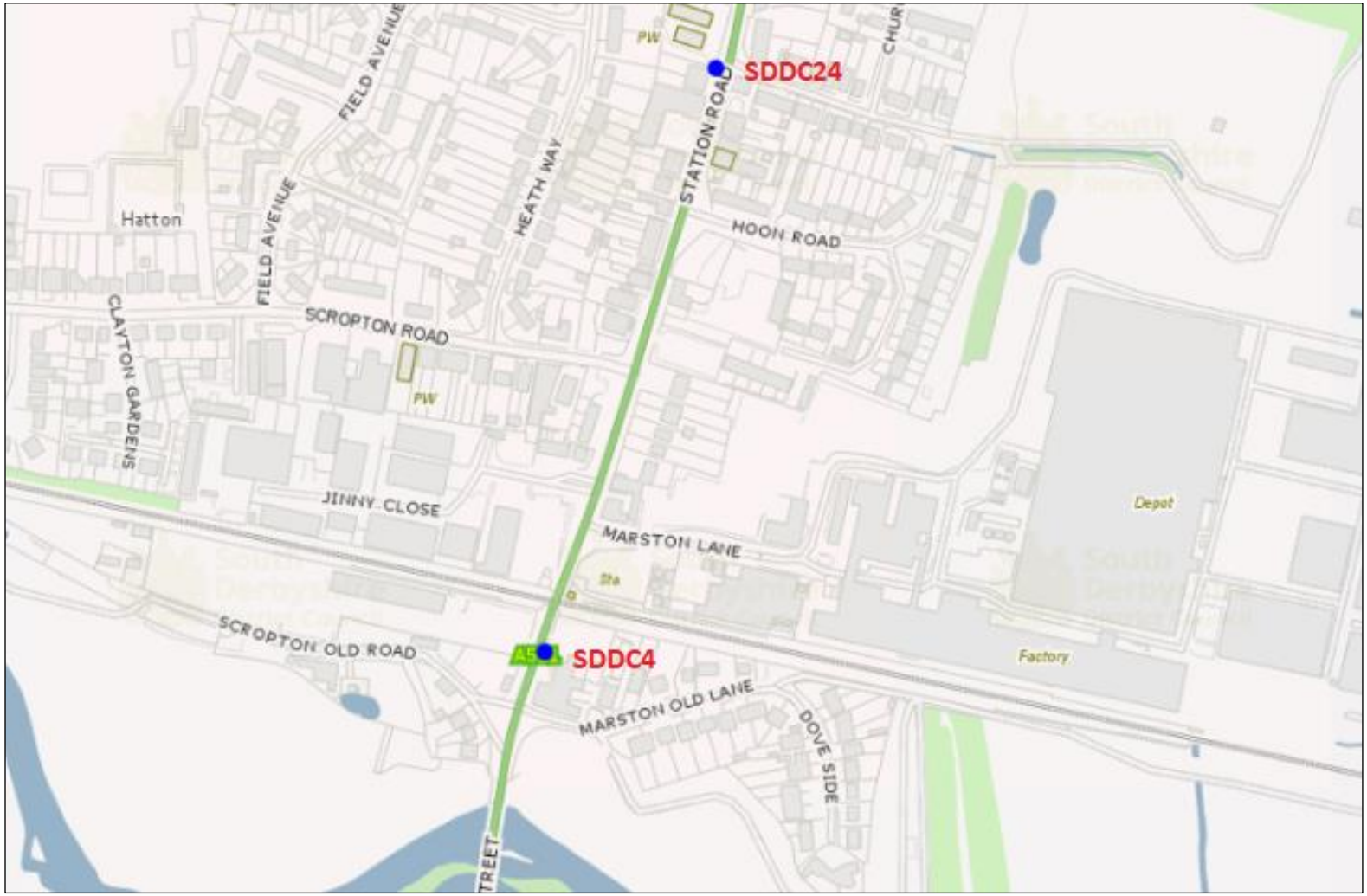


Figure D.1e Map of Non-Automatic Monitoring Sites in Overseal

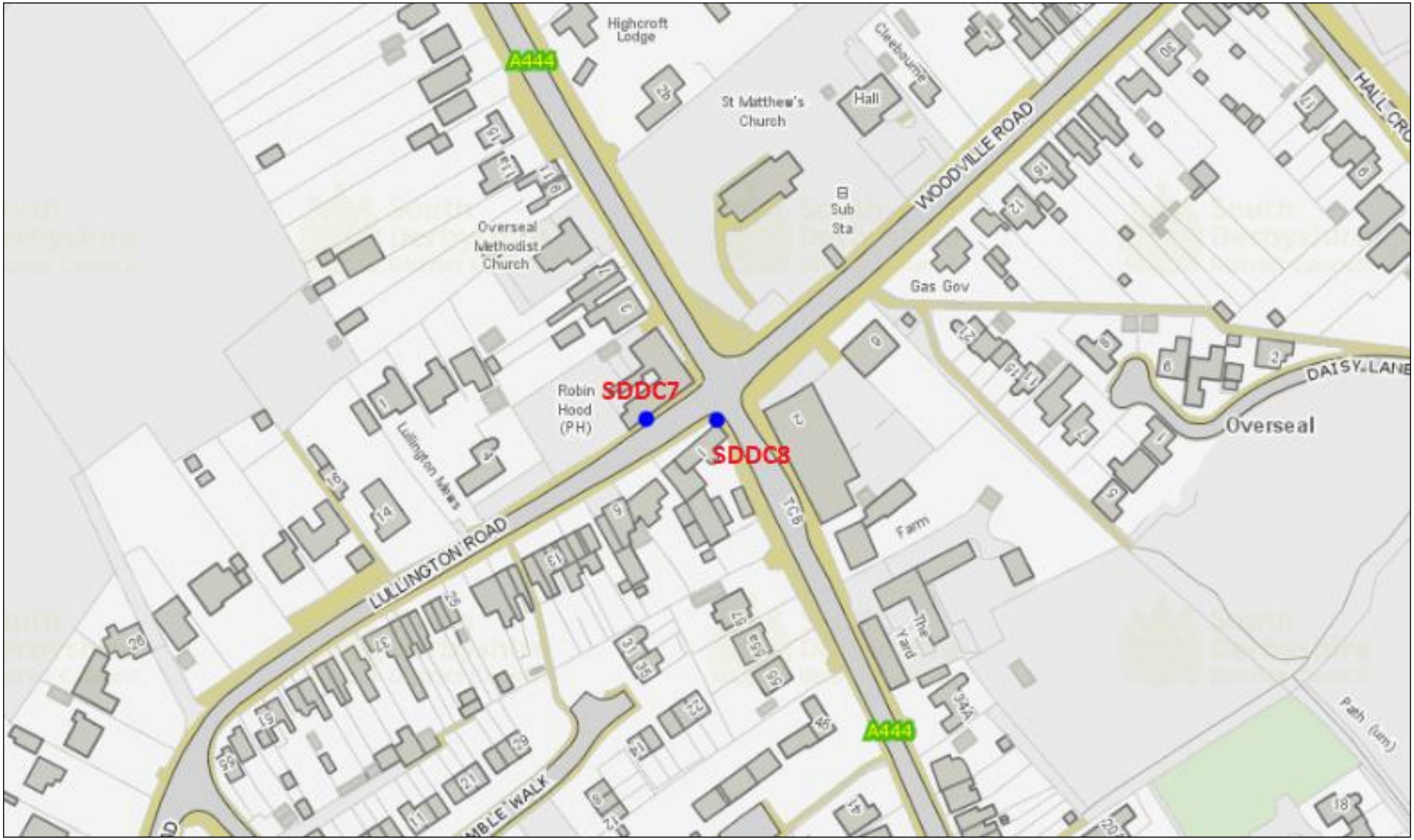


Figure D.1f Map of Non-Automatic Monitoring Sites in Stanton (A444)

Figure D.1g Map of Non-Automatic Monitoring Sites in Repton

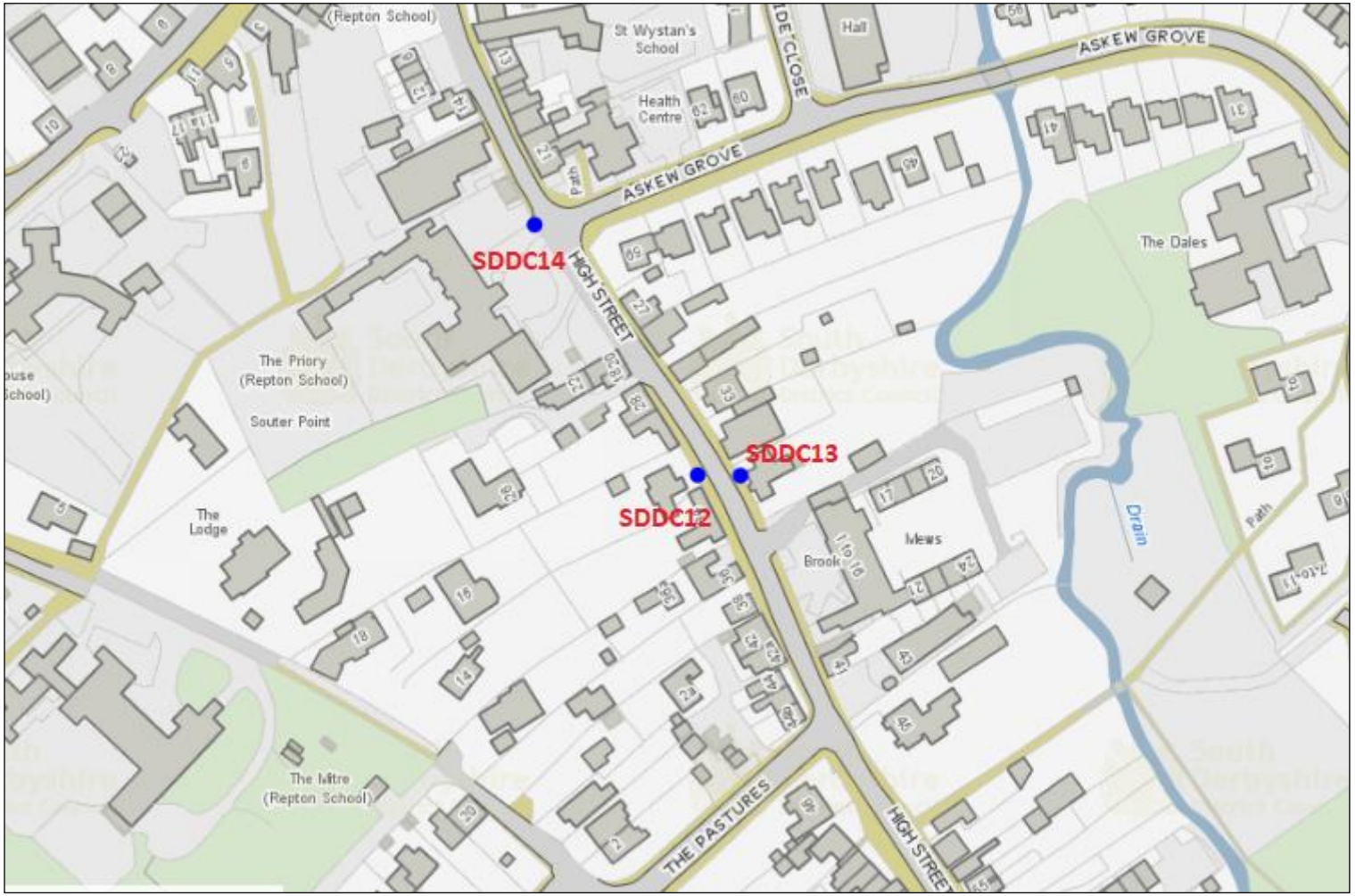


Figure D.1h Map of Non-Automatic Monitoring Sites in Church Gresley

Figure D.1i Map of Non-Automatic Monitoring Site in Willington

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England[7]

Pollutant	Air Quality Objective: Concentration	Air Quality Objective: Measured as
Nitrogen Dioxide (NO_2)	200µg/m^3 not to be exceeded more than 18 times a year	1-hour mean
Nitrogen Dioxide (NO_2)	40µg/m^3	Annual mean
Particulate Matter (PM_{10})	50µg/m^3, not to be exceeded more than 35 times a year	24-hour mean
Particulate Matter (PM_{10})	40µg/m^3	Annual mean
Sulphur Dioxide (SO_2)	350µg/m^3, not to be exceeded more than 24 times a year	1-hour mean
Sulphur Dioxide (SO_2)	125µg/m^3, not to be exceeded more than 3 times a year	24-hour mean
Sulphur Dioxide (SO_2)	266µg/m^3, not to be exceeded more than 35 times a year	15-minute mean

[7] The units are in microgrammes of pollutant per cubic metre of air (µg/m^3).

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	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 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

- Local Air Quality Management Technical Guidance LAQM.TG22. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Policy Guidance LAQM.PG22. Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- SUSTRANS – Change your Travel
- Carbon Fund – Reducing the Carbon Footprint of Your Car
- Derbyshire's Car Sharing Scheme
- Community Transport in Derbyshire
- Bike Back Derby – a local bike refurbishment scheme
- Cycling map of Derbyshire
- Calculate and compensate for your vehicle emissions
- Next Green Car – Best low emissions vehicles of 2016
- Go Ultra Low – Chose your electric car https://www.goultralow.com/choose-your-electric-car/
- UK AIR – five-day Pollution Forecast