



Staffordshire Moorland District Council Annual Status Report 2022

Bureau Veritas

September 2022

Move Forward with Confidence





**BUREAU
VERITAS**

Document Control Sheet

Identification	
Client	Staffordshire Moorland District Council
Document Title	Staffordshire Moorland District Council 2022 Annual Status Report
Bureau Veritas Ref No.	AIR15074043

Contact Details		
Company Name	Bureau Veritas UK Limited	High Peak Borough Council
Contact Name		Alicia Patterson & Daniel McCrory
Position		Head of Service/Senior Pollution Officer
Address	5 th Floor, 66 Prescott Street, London, E1 8HG	Environmental Health, Moorlands House, Stockwell Street, Leek, ST13 6HQ

Configuration				
Version	Date	Author	Reason for Issue/Summary of Changes	Status
1.0	31/08/22	J Cai	Draft issued for client comment	Draft
1.1	07/09/22	J Cai	Updated	Final

	Name	Job Title	Signature
Prepared By	J Cai	Graduate Air Quality Consultant	
Approved By	D Clampin	Senior Consultant	

Commercial In Confidence

© Bureau Veritas UK Limited

The copyright in this work is vested in Bureau Veritas UK Limited, and the information contained herein is confidential. This work, either in whole or in part, may not be reproduced or disclosed to others or used for any purpose, other than for internal client evaluation, without Bureau Veritas' prior written approval.

Bureau Veritas UK Limited, Registered in England & Wales, Company Number: 01758622
Registered Office: Suite 206 Fort Dunlop, Fort Parkway, Birmingham B24 9FD

Disclaimer

This Report was completed by Bureau Veritas on the basis of a defined programme of work and terms and conditions agreed with the Client. Bureau Veritas confirms that in preparing this Report it has exercised all reasonable skill and care taking into account the project objectives, the agreed scope of works, prevailing site conditions and the degree of manpower and resources allocated to the project.

Bureau Veritas accepts no responsibility to any parties whatsoever, following the issue of the Report, for any matters arising outside the agreed scope of the works.

This Report is issued in confidence to the Client and Bureau Veritas has no responsibility to any third parties to whom this Report may be circulated, in part or in full, and any such parties rely on the contents of the report solely at their own risk.

Unless specifically assigned or transferred within the terms of the agreement, the consultant asserts and retains all Copyright, and other Intellectual Property Rights, in and over the Report and its contents.

Any questions or matters arising from this Report should be addressed in the first instance to the Project Manager.



2022 Air Quality Annual Status Report (ASR)

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

September 2022

Information	Staffordshire Moorlands District Council Details
Local Authority Officer	Alicia Patterson & Daniel McCrory
Department	Environmental Health
Address	Environmental Health Staffordshire Moorlands District Council & High Peak Borough Council Moorlands House Stockwell Street Leek ST13 6HQ
Telephone	01538 395400
E-mail	Envhealth@highpeak.gov.uk
Report Reference Number	Staffordshire Moorlands 2022 ASR
Date	August 2022

Executive Summary: Air Quality in Our Area

Air Quality in Staffordshire Moorlands District Council

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children, 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 ages³, with a total estimated healthcare cost to the NHS and social care of £157 million in 2017⁴.

Staffordshire Moorlands District Council (SMDC) is one of nine authorities that make up the County of Staffordshire. SMDC is located in the north of the region, with Stoke-on-Trent to the west and the Peak District National Park to the east.

The primary source of air pollution within SMDC is road traffic emissions from the major roads that cross the district as well as the local roads (A52, A520, A522 and A523) that connect the district's main population centres of Leek, Cheadle and Biddulph. Residential exposure to the increased pollutant concentrations caused by these emissions is the primary concern as there are a number of properties located within close proximity to the road network.

Two [Air Quality Management Areas \(AQMAs\)](#) have been declared within SMDC due to exceedances of the 40 µg/m³ annual mean objective for NO₂; Leek AQMA (encompasses sections of the A523, A53, A520 and A523) and Cellarhead AQMA (encompasses sections of the A52 and A520) both declared in 2019.

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 2021

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

Monitoring of NO₂ is completed throughout SMDC using a network of passive diffusion tubes. During 2021, there were 39 monitoring locations where diffusion tubes were deployed (including two monitoring locations which are undertaken by local schools in a project supported by the council).

There were no reported exceedances of the annual mean NO₂ objective of 40 µg/m³ at any of the monitoring locations during 2021 and an increase in NO₂ concentrations was recorded at 16 out of 19 sites within the AQMAs. This is likely due to the recovery of traffic activities from impacts of the Covid-19 pandemic.

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 Strategy⁵ sets out the case for action, with goals to reduce exposure to harmful pollutants. The Road to Zero⁶ 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.

SMDC are currently in the process of developing an Air Quality Action Plan (AQAP) in response to the declaration of the Leek and Cellarhead AQMAs during 2019. Due to the impacts of Covid-19 and the resulting reallocation of Council resources during 2020 and 2021, the development and implementation of the AQAP has been slightly delayed.

Current estimates are that the AQAP will be prepared and sent out for draft consultation during 2022. Provisional measures have been included in Table 2.2 and a full update will be provided next year to encompass any updates within the finalised AQAP.

During 2021, SMDC has taken forward a number of measures during the reporting year of 2021 in pursuit of improving local air quality:

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

- Energy Saving Trust have completed the assessment of SMDC's fleet and make recommendations to consider in fleet management and suitable replacement when appropriate.
- During 2021, Environmental Services (Waste Collection) trialled a number of electric vehicles, unfortunately all were unsuccessful in having sufficient battery power to complete a normal day's duties. A 3 month trial of the use of HVO (hydrotreated veg. oil) has been completed with positive results.
- Undertook a "SCATTER"⁷ assessment, which is a local authority focussed emissions measurement and modelling tool. This is to obtain a baseline of emissions from the council, and will be used to inform Climate Change Action plan, which is due for publication in 2022.
- Cycle to work scheme has been relaunched.
- Air Aware Project.
- Staffordshire Live Labs – Cellarhead AQMA.

Conclusions and Priorities

During 2021, no exceedances of the NO₂ annual mean objective were recorded within Staffordshire Moorlands. NO₂ concentrations within the AQMAs, monitored via diffusion tubes, were higher at most of the sites (35 out of 39 sites) than concentrations measured at the same locations during 2020.

In relation to the two existing AQMAs, it is recommended that both Leek and Cellarhead remain in force, as monitoring sites within both AQMAs have recorded exceedances of the annual mean objective from 2017 to 2019 within the past five years, with the exception of 2020 and 2021 when under the impact of the Covid-19 pandemics.

As highlighted above, SMDC are currently in the process of developing a new AQAP. Due to the impacts of Covid-19 and the resulting reallocation of Council resources during 2020 and 2021, the development and implementation of the AQAP has been slightly delayed. Current estimates are that the AQAP will be prepared and sent out for draft consultation during 2022.

⁷ SCATTER (Setting City Area Targets and Trajectories for Emissions Reduction), information available at: <https://scattercities.com/>

Local Engagement and How to get Involved

The public can engage with SMDC via their [website](#) which contains further local information on the following:

- Air quality monitoring;
- Declared AQMAs;
- Smoke control areas; and
- Wood burning stoves.

Additional information can also be found on the [Staffordshire County Council website](#), which discusses:

- What is air quality?
- What pollution is there?
- What can you do?
- Support for businesses via travel plans, sustainable travel tool-kits, support setting up a pool bike scheme, cycle and walking maps, and cycle training
- Support for schools:
 - Curriculum linked activities and lesson plans;
 - Modeshift Stars travel planning tool;
 - Calendar of campaigns;
 - Cycle training;
 - Parent engagement and attending school events such as assemblies, school fairs and parent's evenings to provide information;
 - Regular newsletters; and
 - Competitions, activities and rewards.

SMDC is also currently involved in the Air Aware project in collaboration with neighbouring Staffordshire authorities, contributing to the [Air Aware website](#) which provides downloadable materials and further information on:

- Funding;
- Volunteering;
- Small actions that can make a big difference, such as:
 - Turning your car off;
 - Car sharing;
 - Getting on your bike (or scooter);

- Walking;
- Getting your car serviced;
- Working smarter;
- Using public transport;
- Zero and low carbon vehicles; and
- Renewable home energy sources.

Local Responsibilities and Commitment

This ASR was prepared by the Environmental Health Department of Staffordshire Moorlands District Council with the support and agreement of the following officers and departments:

- Communities and Climate Change
- Asset Management
- Service Commissioning

This ASR has been approved by:

- Mark Trillo – Executive Director



- Alicia Patterson – Head of Environmental Health



This ASR has been signed off by a Director of Public Health.

If you have any comments on this ASR please send them to Dr Daniel McCrory at:

Environmental Health

Staffordshire Moorlands District Council

Moorlands House

Stockwell Street

Leek

ST13 6HQ

Email: envhealth@highpeak.gov.uk

Table of Contents

Executive Summary: Air Quality in Our Area	i
Air Quality in Staffordshire Moorlands District Council	i
Actions to Improve Air Quality	ii
Conclusions and Priorities	iii
Local Engagement and How to get Involved.....	iv
Local Responsibilities and Commitment	v
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 Staffordshire Moorlands District Council	4
2.3 PM _{2.5} – Local Authority Approach to Reducing Emissions and/or Concentrations	10
3 Air Quality Monitoring Data and Comparison with Air Quality Objectives and National Compliance	12
3.1 Summary of Monitoring Undertaken.....	12
3.1.1 Automatic Monitoring Sites	12
3.1.2 Non-Automatic Monitoring Sites	12
3.2 Individual Pollutants.....	12
3.2.1 Nitrogen Dioxide (NO ₂)	12
Appendix A: Monitoring Results	16
Appendix B: Full Monthly Diffusion Tube Results for 2021	24
Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC	26
New or Changed Sources Identified Within Staffordshire Moorlands District Council During 2021	26
Additional Air Quality Works Undertaken by Staffordshire Moorlands District Council During 2021	34
QA/QC of Diffusion Tube Monitoring	35
Diffusion Tube Annualisation.....	36
Diffusion Tube Bias Adjustment Factors	36
NO ₂ Fall-off with Distance from the Road.....	37
Appendix D: Map(s) of Monitoring Locations and AQMAs	39
Appendix E: Summary of Air Quality Objectives in England.....	47
Glossary of Terms	48
References	49

Figures

Figure A.1 – Trends in Annual Mean NO ₂ Concentrations: Leek AQMA	21
Figure A.2 – Trends in Annual Mean NO ₂ Concentrations: Cellarhead AQMA.....	22
Figure A.3 – Trends in Annual Mean NO ₂ Concentrations: Outside of AQMA.....	23
Figure D.1 – NO ₂ Diffusion Tube Monitoring Locations: Leek AQMA	39
Figure D.2 – NO ₂ Diffusion Tube Monitoring Locations: Cellarhead AQMA.....	40
Figure D.3 – NO ₂ Diffusion Tube Monitoring Locations: Alton	41
Figure D.4 – NO ₂ Diffusion Tube Monitoring Locations: Blythe Bridge	42
Figure D.5 – NO ₂ Diffusion Tube Monitoring Locations: Cheadle	43
Figure D.6 – NO ₂ Diffusion Tube Monitoring Locations: Newpool and Knowle Style	44
Figure D.7 – NO ₂ Diffusion Tube Monitoring Locations: Upper Tean.....	45
Figure D.8 – NO ₂ Diffusion Tube Monitoring Locations: Wetley Rocks.....	46

Tables

Table 2.1 – Declared Air Quality Management Areas	3
Table 2.2 – Progress on Measures to Improve Air Quality.....	7
Table A.1 – Details of Non-Automatic Monitoring Sites	16
Table A.2 – Annual Mean NO ₂ Monitoring Results: Non-Automatic Monitoring (µg/m ³)	19
Table B.1 – NO ₂ 2021 Diffusion Tube Results (µg/m ³)	24
Table C.1 Details of Planning Application in SMDC during 2021	27
Table C.2 Details of Biomass Boiler Planning Application in SMDC during 2021	33
Table C.2 – Bias Adjustment Factor	37
Table E.1 – Air Quality Objectives in England	47

1 Local Air Quality Management

This report provides an overview of air quality in Staffordshire Moorlands District Council (SMDC) during 2021. 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 SMDC 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 (AQMA) 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.

A summary of AQMA declared by SMDC can be found in Table 2.1. The table presents a description of the two AQMA that are currently designated within SMDC. Appendix D: Map(s) of Monitoring Locations and AQMA provides maps of AQMA and also the air quality monitoring locations in relation to the AQMA. The air quality objectives pertinent to the current AQMA designations are as follows:

- NO₂ annual mean;

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	One Line Description	Is air quality in the AQMA influenced by roads controlled by National Highways?	Level of Exceedance: Declaration	Level of Exceedance: Current Year	Name and Date of AQAP Publication	Web Link to AQAP
SMDC AQMA No.1: Leek	30/07/2019	NO ₂ Annual Mean	The area encompasses the main travel routes through leek and incorporates the following sections of roads; <ul style="list-style-type: none"> • A523; from the A523 Macclesfield Rd/ Grace Rd Junction, through to A523 Ashbourne Road / Springfield Rd Junction. • A53; from the A53 Broad Street / Junction Rd, junction through to A53 Buxton Rd / Springfield Road Junction. • Springfield Road. • A520; from A520 St Edward Street /A523 Stockwell Street junction through to the A520 / Condlyffe Road Junction 	NO	45.3 µg/m ³	35.6 µg/m ³	Ongoing, provisional measure and progress provided in Section 2.2	Ongoing
SMDC AQMA No. 2: Cellarhead	30/07/2019	NO ₂ Annual Mean	The area encompasses the area known locally as the Cellarhead crossroads, which is a busy junction between the A52 and the A520. The AQMA extends 250m (A520) North, 230m South (A520), 480m East (A52) and 210m West (A52) of the junction	NO	51.1 µg/m ³	35.6 µg/m ³	Ongoing, provisional measure and progress provided in Section 2.2	Ongoing

☒ SMDC confirm the information on UK-Air regarding their AQMA(s) is up to date.

☐ SMDC confirm that all current AQAPs have been submitted to Defra.

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

Defra's appraisal of last year's ASR concluded that "the report is well structured, detailed, and provides the information specified in the Guidance". Additional comments made are as follows:

1. *"Encourage formally publishing AQAP, and provide detailed update in next ASR. ie more than just saying ongoing."*
2. *Good discussion of trends.*
3. *Robust and accurate QA/QC procedures were applied. Calculations for bias adjustment and annualisation were outlined in detail. The Council also included their diffusion tube data processing tool for absolute clearness. This approach is encouraged.*
4. *Comments from last year's have not been mentioned.*
5. *Costs and funding statuses have not been included for any of the measures within the action plan table. Even if this is not known, a 'TBC' could be included to show that this has not been finalised rather than being left blank.*
6. *The Public Health Outcomes Framework and indicator 3.01 were referenced, and this is encouraged. There is detailed discussion of PM_{2.5} exposure in the borough.*
7. *As the Council mentions, some locations out of the AQMAs have been within 10% of the objective in previous years to 2020. These areas should continue to be monitored to see if a new AQMA will need to be introduced in future years.*
8. *Overall the report is detailed, concise and satisfies the criteria of relevant standards. The Council should continue their good and thorough work."*

SMDC continues working to prepare AQAP this year and progress and provisional measures are provided in this section. Funding status of the measures are updated according to the comments from appraisal.

SMDC has taken forward a number of direct measures during the current reporting year of 2021 in pursuit of improving local air quality. The Council are currently in the process of finalising the substantial work that has been undertaken on an AQAP for the Leek and

Cellarhead AQMAs that were declared during 2019. The updated AQAP is expected to be released for consultation later this year and provisional measures have been included in Table 2.2. 26 measures are included within Table 2.2, with the type of measure and the progress SMDC have made during the reporting year of 2021 presented. Where there have been, or continue to be, barriers restricting the implementation of the measure, these are also presented within Table 2.2.

Key measures progressed and completed during 2021 are:

- Energy Saving Trust have completed the assessment of SMDC's fleet and make recommendations to consider in fleet management and suitable replacement when appropriate.
- During 2021 Environmental Services (Waste Collection) trialled a number of electric vehicles, unfortunately all were unsuccessful in having sufficient battery power to complete normal days duties. A 3 month trial of the use of HVO (hydrotreated veg. oil) has been completed with positive results.
- Undertook a "SCATTER"⁸ assessment, which is a local authority focussed emissions measurement and modelling tool. This is to obtain a baseline of emissions from the council, and will be used to inform Climate Change Action plan, which is due for publication in 2022.
- Cycle to work scheme has been relaunched.
- Air Aware Project.
- Staffordshire Live Labs – Cellarhead AQMA.

Details of Air Aware Project and Staffordshire Live Labs are provided in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC.

SMDC worked to implement these measures in partnership with the following stakeholders during 2021:

- Staffordshire County Council (SCC);
- High Peak Borough Council (HPBC);
- Department for Transport;
- Transport & Travel Research Ltd

⁸ SCATTER (Setting City Area Targets and Trajectories for Emissions Reduction), information available at: <https://scattercities.com/>

- Amey;
- Keele University;
- Staffordshire AQ Forum.

SMDC anticipates that the measures stated above and in Table 2.2 will achieve compliance in Leek AQMA and Cellarhead AQMA.

Table 2.2 – 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	EcoStars Fleet Recognition Programme	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2015	Operational	SMDC and Transport & Travel Research Ltd	SMDC/ Defra Grant	YES	Funded		Implementation	Reduced fuel consumption	Reduced fuel consumption	Quantitative appraisal is on-going	www.ecostars-uk.com
2	Development of an Electric Vehicle strategy	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2019/2020	Operational	SMDC/Staffordshire County Council (SCC)	SCC/ SMDC/Defra Grant	YES	Funded		Implementation	Reduced emissions from vehicles	TBC	Implementation is on-going	https://www.staffordshire.gov.uk/Transport/Sustainable-travel/Electric-vehicles/Electric-vehicles.aspx
3	Installation of EV charge points at Council owned Car Parks	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2021	2021 /2022	SMDC	SMDC/Defra Grant	YES	Funded		Implementation	Reduced emissions from vehicles	TBC	Parking review being undertaken for the borough	
4	Incentivise parking for low emission vehicles	Promoting Low Emission Transport	Emission based parking or permit charges	2021	2021 /2022	SMDC	None	NO	Not Funded		Implementation	Reduced emissions from vehicles	TBC	Parking review being undertaken for the district	
5	Continue to promote and increase the installation of EV charging points through development control processes	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2015	Operational	SMDC	None	NO	Not Funded			Reduced emissions from vehicles	increased installation of EV charging points	EV charging points are conditioned through the planning process, this is to be strengthened by the implementation of Air Quality supplementary planning document	
6	Deployment of Fotec Traffic Management Solutions at Cellarhead Crossroads	Traffic Management	Control systems, Congestion management, traffic reduction Urban Traffic	2020	Operational	Amey/SCC/Keele University/ SMDC	Department for Transport through ADEPT (Association of Directors for Economy, Environment, Planning and Transport).	NO	Funded		Implementation	Reduced emissions from vehicles	Reduction in traffic congestion	Implementation is on-going	https://www.amey.co.uk/amey-consulting/news-and-case-studies/2021/march/staffordshire-county-council-and-amey-monitor-air-quality-ahead-of-innovative-trials/
7	Review of junctions in Leek and Cellarhead	Traffic Management	UTC, Congestion management, traffic reduction	Not yet commenced	Not yet commenced	SCC	SCC Capital Highways Programme	NO	Funded		Planning	Reduced emissions from vehicles	Reduction in traffic congestion	Not yet commenced	
8	Business Travel; Planning	Promoting Travel Alternatives	Workplace Travel Planning	2018/ 2019	Operational	SMDC/ SCC	SCC/ SMDC/Defra Grant	YES	Funded		Implementation	Reduced emissions from vehicles	No of Business Travel Plans approved & adopted	Quantitative appraisal is on-going	https://www.staffordshire.gov.uk/DoingOurBit/Get-Inspired/Clean-green-and-safe/Air-aware/Air-aware.aspx
9	Car share scheme		Car and lift sharing schemes	2018/ 2019	Operational	SMDC/ SCC	SCC/ SMDC/Defra Grant	YES	Funded		Implementation	Reduced emissions from vehicles	No of users registered	Quantitative appraisal is on-going	https://share-a-lift.co.uk/

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
10	School Travel Planning	Promoting Travel Alternatives	School Travel Plans	2018/ 2019	Operational	SMDC/ SCC	SCC/ SMDC/Defra Grant	YES	Funded		Implementation	Reduced emissions from vehicles	No of Schools Travel Plans approved & adopted	Quantitative appraisal is on-going	https://www.staffordshire.gov.uk/DoingOurBit/Get-Inspired/Clean-green-and-safe/Air-aware/Air-aware.aspx
11	School based educational activities	Promoting Travel Alternatives / Public Information	Other	2018/ 2019	Operational	SMDC/ SCC	SCC/ SMDC/Defra Grant	YES	Funded		Implementation	Through public awareness	No of schools engaged	Quantitative appraisal is on-going	https://www.staffordshire.gov.uk/DoingOurBit/Get-Inspired/Clean-green-and-safe/Air-aware/Air-aware.aspx
12	Anti-idling initiatives in educational settings	Traffic Management	Anti-idling enforcement	2018/ 2019	Operational	SMDC/ SCC	SCC/ SMDC/Defra Grant	YES	Funded		Implementation	Reduced emissions from vehicles	N/A	Quantitative appraisal is on-going	https://www.staffordshire.gov.uk/DoingOurBit/Get-Inspired/Clean-green-and-safe/Air-aware/Air-aware.aspx
13	Communication initiatives, e.g. website information updates	Public Information	Other	2017/18	Operational	SCC / SMDC	SCC / SMDC/Defra Grant	YES	Funded		Implementation	Through public awareness	New website	Implementation is on- going	https://www.staffordshire.gov.uk/DoingOurBit/Get-Inspired/Clean-green-and-safe/Air-aware/Air-aware.aspx
14	Encourage taxis licensed by the Council to comply with vehicle emission limits	Promoting Low Emission Transport	Other	Not yet commenced	Not yet commenced	SMDC	SMDC	NO	Funded		Planning	Reduced emissions from vehicles	Number of LEV Taxis in the fleet. All licensed taxis should meet minimum emission standard	This has been on hold whilst we awaited the outcome of National Guidance. Consultation with taxi drivers planned for 2021	
15	Support the procurement of greener fleet	Vehicle Fleet Efficiency	Fleet efficiency and recognition schemes	2019	Not known	SMDC	SMDC	TBC	TBC		Implementation	Reduced emissions from vehicles and buildings	Number of LEV in the fleet	Green Fleet Review is on going	Energy Saving Trust have completed the assessment of our fleet and make recommendations to consider in fleet management and suitable replacement when appropriate
16	Review SMDC Local Plan Policy SD4	Policy Guidance and Development Control	Other policy	2020	2023	SMDC	SMDC	TBC	TBC		Implementation	Reduced emissions from vehicles and buildings	TBC	Implementation is on- going	
17	Review SMDC Local Plan Policy T1	Policy Guidance and Development Control	Other policy	2020	2023	SMDC	SMDC	TBC	TBC		Implementation	Reduced emissions from vehicles and buildings	TBC	Implementation is on- going	
18	Review SMDC Local Plan Policy DC1	Policy Guidance and Development Control	Other policy	2020	2023	SMDC	SMDC	TBC	TBC		Implementation	Reduced emissions from vehicles and buildings	TBC	Implementation is on- going	
19	Staffordshire Air Quality Forum	Policy Guidance and Development Control	Regional Groups Co-ordinating programmes to develop Area wide Strategies to reduce emissions and improve air quality	On-going	On-going	County-wide	-	TBC	TBC		Implementation	N/A	Full engagement across the group / regular meetings	On-going	-

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
20	Use of the planning regime to minimise impact of new developments on AQMA's	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	On-going	2022	SMDC/Staffordshire AQ Forum	SMDC	TBC	TBC		Implementation	Published Supplementary Planning Document (SPD)	SPD implemented	Draft SPD produced currently being reviewed by Staffs Air Quality Forum	
21	Integration of air quality into all relevant council policies and documents	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	On-going	SMDC	SMDC	TBC	TBC		Implementation	N/A	Reference to Air Quality in all relevant Council Policies	On-going	
22	Inspect under the Environmental Permit regime and enforce legislation to reduce combustion processes	Environmental Permits	Introduction/increase of environment charges through permit systems and economic instruments	Completed	Continual	SMDC	SMDC	NO	TBC		Completed	Restricting emissions from industrial processes	Installations adhering to permits and enforcement / penalties for breaches	On-going	This is standard work completed by the Environmental Protection team
23	Air quality monitoring	Public Information	Other	On-going	Reviewed annually	SMDC	SMDC	NO	TBC		Implementation	Through EHO / public awareness	Monitoring locations and LAQM reporting	On-going	Monitoring network is reviewed each year, consideration for funding through AQ grant
24	Electric vehicles trial and HVO (hydrotreated veg oil) trail	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	2021	2021	SMDC/HPBC	SMDC/HPBC	No	TBC		Completed	Reduced emissions from vehicles	N/A	Completed	During 2021, Environmental Services (Waste Collection) trialed a number of electric vehicles, unfortunately all were unsuccessful in having sufficient battery power to complete normal days duties. A 3 month trial of the use of HVO (hydrotreated veg. oil) has been completed with positive results.
25	Cycle to work	Promoting Travel Alternatives	Promotion of cycling	2021	Ongoing	SMDC	SMDC	TBC	TBC		Implementation	Reduced emissions from vehicles	No. of people attending the scheme	Ongoing	Cycle to work scheme relaunched
26	Staffordshire Live Labs – Cellarhead AQMA	Traffic Management	Other	2020	2022	SMDC/ Department for Transport	Department for Transport	NO	Funded		Implementation	N/A	N/A	Ongoing	The project was initiated in 2020 and has continued through 2021. Early results indicate the system can be used to detect the movement of vehicles approaching a junction and priorities their movement to improve air quality. The project is due to finish in 2022 with the final AQ impact report expected towards the end of 2022.

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

As detailed in Policy Guidance LAQM.PG22 (Chapter 8), 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.

Efforts within Staffordshire Moorlands are being concentrated on monitoring NO₂ levels, with a particular focus on the established AQMAs. As primary emissions of both NO₂ and particulates predominately originate from the same source, measures implemented to reduce NO₂ levels within the district will also reduce levels of PM₁₀ and PM_{2.5}.

The current Defra 2021 background maps for SMDC (2018 based⁹) show that the highest concentration across the district is predicted to be 7.9 µg/m³ within the 1 x 1 km grid square with the centroid grid reference of 399500 342500, an area southwest of the Cheadle.

The Public Health Outcomes Framework data tool¹⁰ compiled by Public Health England quantifies the mortality burden of PM_{2.5} within England on a county and local authority scale. The 2020 fraction of mortality attributable to PM_{2.5} pollution across England is 5.6%, and the fraction within Staffordshire Moorlands District Council is below the national average at 4.5%, as well as being below the West Midlands regional average of 5.2%.

LAQM.TG(16) Table A.1 Action toolbox presents a list of measures that can be implemented to help reduce concentrations of PM_{2.5}. Where required, SMDC will review any proposed measures to be implemented, to consider the potential impact of the measures, and whether any further action is required.

⁹ Defra Background Mapping data for local authorities (2018-based), available online at <https://uk-air.defra.gov.uk/data/laqm-background-maps?year=2018>

¹⁰ Public Health Outcomes Framework, Public Health England. data tool available online at <https://fingertips.phe.org.uk/search/air%20quality#page/1/gid/1/pat/6/par/E12000009/ati/202/are/E10000013/cid/4/page-options/ovw-do-0>

23 measures (from measure 1 to measure 15 and measure 19 to measure 26) in Table 2.2 also contribute to the reduction of PM_{2.5} emission. In addition, the SMDC is also taking the following measures to address PM_{2.5}:

- Urban Traffic Control in Leek Town Centre;
- Advisory 20mph zones near some schools in residential areas;
- Proposed reinstatement of Leek rail connection. Planning application approved during 2021;
- Potential bus stop upgrade in Cheadle Town Centre;
- Car Clubs;
- Driver training and ECO driving aids;
- [Domestic Smoke Control advice and Enforcement](#);
- [Garden Bonfires - Advice and nuisance enforcement](#);
- Commercial burning advice and enforcement;
- Multi agency working with Fire Service and Environment Agency for trade burning;
- Multi agency working with Staffordshire Fire Service and Local Authority Building Control regarding chimney fires and complaints about DIY domestic heating systems.

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

This section sets out the monitoring undertaken within 2021 by SMDC and how it compares with the relevant air quality objectives. In addition, monitoring results are presented for a five-year period between 2017 and 2021 to allow monitoring trends to be identified and discussed.

3.1 Summary of Monitoring Undertaken

3.1.1 Automatic Monitoring Sites

SMDC did not carry out any automatic (continuous) monitoring of pollutants during 2021.

3.1.2 Non-Automatic Monitoring Sites

SMDC undertook non-automatic (i.e. passive) monitoring of NO₂ at 39 sites during 2021. Table A.1 in Appendix A presents the details of the non-automatic sites.

Maps showing the location of the monitoring sites are provided in Appendix D: Map(s) of Monitoring Locations and AQMAs. 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 (NO₂)

Table A.2 in Appendix A compare the ratified and adjusted monitored NO₂ annual mean concentrations for the past five years with the air quality objective of 40µg/m³. 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 2021 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.

All diffusion tube monitoring locations within SMDC recorded data capture of at least 75% during 2021, therefore it was not required to annualise any monitoring data.

The NO₂ results for 2021 have been bias adjusted using a national bias adjustment factor of 0.85. Full details of the bias adjustment and QA/QC monitoring procedures are provided in Appendix C: Supporting Technical Information / Air Quality Monitoring Data QA/QC.

The analysis of the 2021 monitoring data is completed below in relation to the designated AQMAs within SMDC. The annual mean NO₂ concentration was not greater than 60 µg/m³ at any diffusion tube monitoring sites during 2021. Therefore, exceedance of the 1-hour mean objective of 200 µg/m³ at any monitoring location within the district is considered to be unlikely.

The concentrations recorded at 16 out of 19 sites within the AQMAs increased in 2021 but were all below the annual mean objective of 40 µg/m³. This is likely due to the recovery of the traffic activities from the impacts of the Covid-19 pandemic.

Among the sites, site AS01 and WF01 are undertaken by local schools in project supported by the council. The detailed information of the project can be found on the Council website – [Air Quality School](#) page.

SMDC AQMA No.1 – Leek

Monitored concentrations are presented in Table A.2 and Figure A.1. The concentrations in Figure A.1 are compared against the annual mean objective value for NO₂.

There are 11 diffusion tube locations within the Leek AQMA. During 2021, site 47 (24.6 µg/m³) recorded the lowest concentration of any of the Leek AQMA monitoring sites, whilst the highest concentration within the AQMA was recorded at site 25 (35.6 µg/m³). A general trend of reduction is observed over the past five years, with the exception of 2021 during which a recovery in traffic activities from the impact of Covid-19 pandemic has resulted in increased emissions. Concentrations at sites 25, 47 and 48 increased slightly in 2019.

Over the past five years, concentrations at sites 24, 25, 37 and 57 have exceeded the annual mean objective of $40 \mu\text{g}/\text{m}^3$ from 2017 to 2019 during the pre-Covid period. Therefore, the AQMA is to remain in force.

SMDC AQMA No. 2 – Cellarhead

Monitored concentrations are presented in Table A.2 and Figure A.2. The concentrations in Figure A.2 are compared against the annual mean objective value for NO_2 .

There are 8 diffusion tube locations within the Cellarhead AQMA. During 2021, site 54 ($19.3 \mu\text{g}/\text{m}^3$) recorded the lowest concentration of any of the Cellarhead AQMA monitoring sites, whilst the highest concentration within the AQMA was recorded at site 38 ($35.6 \mu\text{g}/\text{m}^3$). A general trend of reduction is observed over the past five years, with the exception of 2021, during which a recovery in traffic activities from the impact of Covid-19 pandemic has resulted in increased emissions compared to 2020. Concentrations at sites 38, 39 and 42 increased slightly in 2019. Concentrations at site 49 increased during 2018 but fell again, below 2017 levels, during 2019.

Over the past five years, concentrations at sites 38, 39, 42 and 53 have exceeded the annual mean objective of $40 \mu\text{g}/\text{m}^3$ from 2017 to 2019 during the pre-Covid period. Therefore, the AQMA is to remain in force.

Diffusion Tubes Outside of Existing AQMAs

Monitored concentrations are presented in Table A.2 and Figure A.3. The concentrations in Figure A.3 are compared against the annual mean objective value for NO_2 .

There are 20 diffusion tube monitoring sites located outside of the existing AQMAs, 10 of which have been monitoring for at least five years. During 2021, site 12 recorded the lowest concentration ($9.4 \mu\text{g}/\text{m}^3$) of any of the monitoring sites located outside of the AQMAs, whilst the highest concentration outside of the AQMAs was recorded at site 61 ($31.5 \mu\text{g}/\text{m}^3$).

Outside of the existing AQMAs, 2021 NO_2 concentrations are compliant. However, during 2018 and 2019, concentrations at sites 7, 29, and 52 exceeded, or measured within 10% of, the annual mean objective of $40 \mu\text{g}/\text{m}^3$ (monitored 2019 concentrations were $36.2 \mu\text{g}/\text{m}^3$, $39.7 \mu\text{g}/\text{m}^3$, and $40.1 \mu\text{g}/\text{m}^3$ respectively). Although there is currently no AQMA declared in this location, the area has been identified in the [SMDC Integrated Transport Strategy](#):

“A522 Tape Street, Cheadle, is being monitored for exceedances in the vicinity of residential properties adjacent to queuing traffic at peak times”.

In addition, as referred to in the above strategy, the council identified a [planning application](#) in 2018 for construction of a number of properties in the vicinity of the area, and has specified a planning condition requiring the developer to undertake a detailed source apportionment exercise:

“... The full scope of the mitigation plan shall be first agreed in writing with the Local Planning Authority and shall be so designed to quantify the source contributions (e.g. HGVs, buses, taxis, cars etc.) responsible for the exceedance of the relevant objective in 2022 and detail possible mitigation measures to improve air quality...”

From the assessment, it is concluded that:

Car use is the prevailing contributor of NO_x emission at the affected receptor location adjacent to Leek Road, representing 44% of the overall total modelled NO_x emissions. It is also pertinent to provide discussion on the emission associated with HDV and Bus contribution. Whilst these vehicles form 6% of the Leek Road fleet, they contribute 28.6% of NO_x emissions, highlighting their significant emission contributions in comparison to their relatively low traffic proportions.

It is suggested that:

“Following this analysis, it is recommended the SMDC explore measures to reduce both HDV and Bus movements along Leek Road to reduce impacts at R4, R24 and R25. It is considered that strategies to reduce private car trips, guided by government policy, the draft SMDC Air Quality Action Plan, and sustainable travel plan produced for the Proposed Development, will reduce the contribution of existing and proposed car movements.”

Based on the assessment, SMDC will progress with relevant measures in the draft AQAP.

Appendix A: Monitoring Results

Table A.1 – 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)
1	Wetley Rocks	Roadside	396535	349111	NO ₂	No	1.7	2.5	No	3.0
5	Blythe Bridge (Chestnut Crescent)	Roadside	396353	340607	NO ₂	No	0.0	0.0	No	2.6
6	Teian	Roadside	401095	339425	NO ₂	No	0.5	2.0	No	2.7
7	Cheadle (Leek Road Rbt Central) (*2)	Roadside	400967	343564	NO ₂	No	0.2	2.0	No	2.7
8	Alton (Chapel)	Roadside	407237	342257	NO ₂	No	3.0	1.0	No	3.1
10	Leek (Moorlands House)	Roadside	398486	356630	NO ₂	AQMA 1: Leek	3.5	0.2	No	3.4
11	Leek (Swan Hotel)	Roadside	398295	356587	NO ₂	AQMA 1: Leek	7.0	0.7	No	2.9
12	Leek (Southlands Close)	Urban Background	397430	356516	NO ₂	No	13.0	2.0	No	2.7
14	Cheadle (Tape Street)	Roadside	400990	343365	NO ₂	No	1.0	1.0	No	2.8
17	Biddulph (Knypersly, Cross Rds)	Roadside	388030	356757	NO ₂	No	3.0	2.5	No	2.4
24A, 24B	Leek (Ball Haye St _ Central) (*2)	Roadside	398691	356579	NO ₂	AQMA 1: Leek	0.2	3.0	No	2.7
25	Leek (Broad Street Jct North_1)	Roadside	398354	356329	NO ₂	AQMA 1: Leek	NA	2.3	No	2.7
29	Cheadle (Leek Road Rbt _ North)	Roadside	400968	343579	NO ₂	No	0.2	2.0	No	2.5
30	Cheadle (Leek Road Rbt _ South)	Roadside	400967	343548	NO ₂	No	0.2	2.0	No	2.8

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)
31	Leek (Ball Haye St_South)	Roadside	398688	356547	NO ₂	AQMA 1: Leek	0.2	3.0	No	2.7
32	Leek (Ball Haye St_North)	Roadside	398693	356616	NO ₂	AQMA 1: Leek	0.2	3.0	No	2.8
34	Leek (Broad Street Vets_South 2)	Roadside	398172	356253	NO ₂	No	1.5	2.4	No	2.9
37A, 37B	Leek (Broad Street North_3) (*2)	Roadside	398333	356313	NO ₂	AQMA 1: Leek	0.2	3.5	No	2.5
38A, 38B	Cellarhead Junction_2 (*2)	Roadside	395702	347548	NO ₂	AQMA 2: Cellarhead	0.2	1.8	No	2.6
39A, 39B	Cellarhead Junction_3 (*2)	Roadside	395702	347553	NO ₂	AQMA 2: Cellarhead	0.2	1.8	No	2.5
41A, 41B	Leek (Broad Street Jct North_4) (*2)	Roadside	398323	356306	NO ₂	AQMA 1: Leek	0.1	3.5	No	2.7
42A, 42B	Cellar Head Junction 4 (*2)	Roadside	395704	347562	NO ₂	AQMA 2: Cellarhead	0.2	1.8	No	2.7
47	Broad Street South	Roadside	398245	356232	NO ₂	AQMA 1: Leek	1.4	2.8	No	2.6
48	Broad Street Junction	Roadside	398397	356322	NO ₂	AQMA 1: Leek	2.0	2.0	No	3.3
49	Cellar Head Junction 4	Roadside	395811	347530	NO ₂	AQMA 2: Cellarhead	40.0	2.0	No	2.5
50	Cheadle Tape St easb bound	Roadside	401043	342917	NO ₂	No	80.0	2.0	No	2.5
51	Cheadle Tape St west bound	Roadside	401062	343045	NO ₂	No	1.2	1.8	No	2.6
52	Cheadle Tape St west bound 2	Roadside	401049	343151	NO ₂	No	2.5	1.2	No	2.4
53	Cellarhead Junction_5	Roadside	395727	347570	NO ₂	AQMA 2: Cellarhead	0.5	1.5	No	2.7
54	Cellarhead Junction_6	Roadside	395732	347575	NO ₂	AQMA 2: Cellarhead	1.0	1.4	No	2.6
55	Cellarhead Junction_7	Roadside	395754	347560	NO ₂	AQMA 2: Cellarhead	8.0	1.6	No	2.6

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)
56	Cellarhead Junction_8	Roadside	395699	347577	NO ₂	AQMA 2: Cellarhead	3.2	1.0	No	2.7
57	Broad Street South	Roadside	398107	356157	NO ₂	AQMA 1: Leek	1.0	2.5	No	2.8
58	Blythe Bridge	Roadside	395980	341065	NO ₂	No	7.0	1.8	No	2.6
59	Biddulph (Knypersly, Cross Rds)_2	Roadside	388054	356808	NO ₂	No	4.9	2.7	No	2.5
60	Biddulph (Knypersly, Cross Rds)_3	Roadside	387997	356756	NO ₂	No	5.6	2.3	No	2.6
61	Leek Compton Rd	Roadside	398379	356756	NO ₂	No	1.8	0.4	No	2.4
AS01	All Saints CE 1st School	Roadside	397386	356344	NO ₂	No	N/A	2.1	No	2.6
WF01	Westwood 1st School Rd	Roadside	398537	355596	NO ₂	No	N/A	1.6	No	2.6

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: Non-Automatic Monitoring (µg/m³)

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 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
1	396535	349111	Roadside	100.0	100.0	27.6	28.0	24.6	19.8	21.6
5	396353	340607	Roadside	92.3	92.3	25.3	24.7	24.4	17.9	17.9
6	401095	339425	Roadside	100.0	100.0	28.9	26.9	25.7	19.7	21.0
7	400967	343564	Roadside	100.0	100.0	35.2	38.0	36.2	27.7	30.7
8	407237	342257	Roadside	100.0	100.0	20.4	24.2	21.1	13.6	17.2
10	398486	356630	Roadside	100.0	100.0	31.3	30.6	29.8	21.1	25.5
11	398295	356587	Roadside	100.0	100.0	35.2	35.4	35.4	24.7	27.1
12	397430	356516	Urban Background	100.0	100.0	11.4	12.3	-	8.6	9.4
14	400990	343365	Roadside	100.0	100.0	30.6	32.0	26.6	19.3	21.8
17	388030	356757	Roadside	92.3	92.3	28.3	23.5	22.9	23.1	25.8
24A, 24B	398691	356579	Roadside	100.0	100.0	42.1	38.6	37.0	28.6	30.9
25	398354	356329	Roadside	84.6	84.6	41.6	43.4	44.1	32.0	35.6
29	400968	343579	Roadside	100.0	100.0	33.1	36.9	39.7	27.6	27.3
30	400967	343548	Roadside	100.0	100.0	33.8	33.5	35.5	27.3	30.7
31	398688	356547	Roadside	100.0	100.0	33.9	32.3	31.8	25.7	25.1
32	398693	356616	Roadside	100.0	100.0	36.0	37.0	34.1	26.1	31.0
34	398172	356253	Roadside	100.0	100.0	28.8	27.6	26.3	21.8	23.4
37A, 37B	398333	356313	Roadside	100.0	100.0	41.8	39.8	39.2	31.5	32.7
38A, 38B	395702	347548	Roadside	100.0	100.0	47.9	42.3	42.5	32.0	35.6
39A, 39B	395702	347553	Roadside	100.0	100.0	48.2	42.1	42.7	32.4	35.1
41A, 41B	398323	356306	Roadside	100.0	100.0	32.3	31.8	31.1	25.5	25.4
42A, 42B	395704	347562	Roadside	100.0	100.0	41.2	40.7	42.0	30.6	32.8
47	398245	356232	Roadside	100.0	100.0	22.6	27.5	28.8	22.5	24.6
48	398397	356322	Roadside	82.7	82.7	33.2	32.9	34.9	27.0	32.9
49	395811	347530	Roadside	100.0	100.0	27.8	30.0	25.1	18.7	20.0
50	401043	342917	Roadside	100.0	100.0	-	28.6	22.7	17.6	19.5
51	401062	343045	Roadside	100.0	100.0	-	24.6	30.2	23.0	26.8
52	401049	343151	Roadside	100.0	100.0	-	37.1	40.1	28.7	29.9
53	395727	347570	Roadside	100.0	100.0	-	-	41.9	28.4	30.2
54	395732	347575	Roadside	92.3	92.3	-	-	30.5	17.4	19.3
55	395754	347560	Roadside	100.0	100.0	-	-	32.1	23.6	25.9
56	395699	347577	Roadside	100.0	100.0	-	-	38.1	27.6	27.3
57	398107	356157	Roadside	100.0	100.0	-	-	41.7	31.0	32.3
58	395980	341065	Roadside	100.0	100.0	-	-	25.1	17.2	18.9
59	388054	356808	Roadside	100.0	100.0	-	-	-	23.8	25.7

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 2021 (%) ⁽²⁾	2017	2018	2019	2020	2021
60	387997	356756	Roadside	100.0	100.0	-	-	-	16.0	17.9
61	398379	356756	Roadside	82.7	82.7	-	-	-	27.9	31.5
AS01	397386	356344	Roadside	73.1	73.1	-	-	-	-	11.2
WF01	398537	355596	Roadside	100.0	100.0	-	-	-	-	20.1

☐ 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 $\mu\text{g}/\text{m}^3$.

Exceedances of the NO₂ annual mean objective of $40\mu\text{g}/\text{m}^3$ are shown in **bold**.

NO₂ annual means exceeding $60\mu\text{g}/\text{m}^3$, indicating a potential exceedance of the NO₂ 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.TG16 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%).

Figure A.1 – Trends in Annual Mean NO₂ Concentrations: Leek AQMA

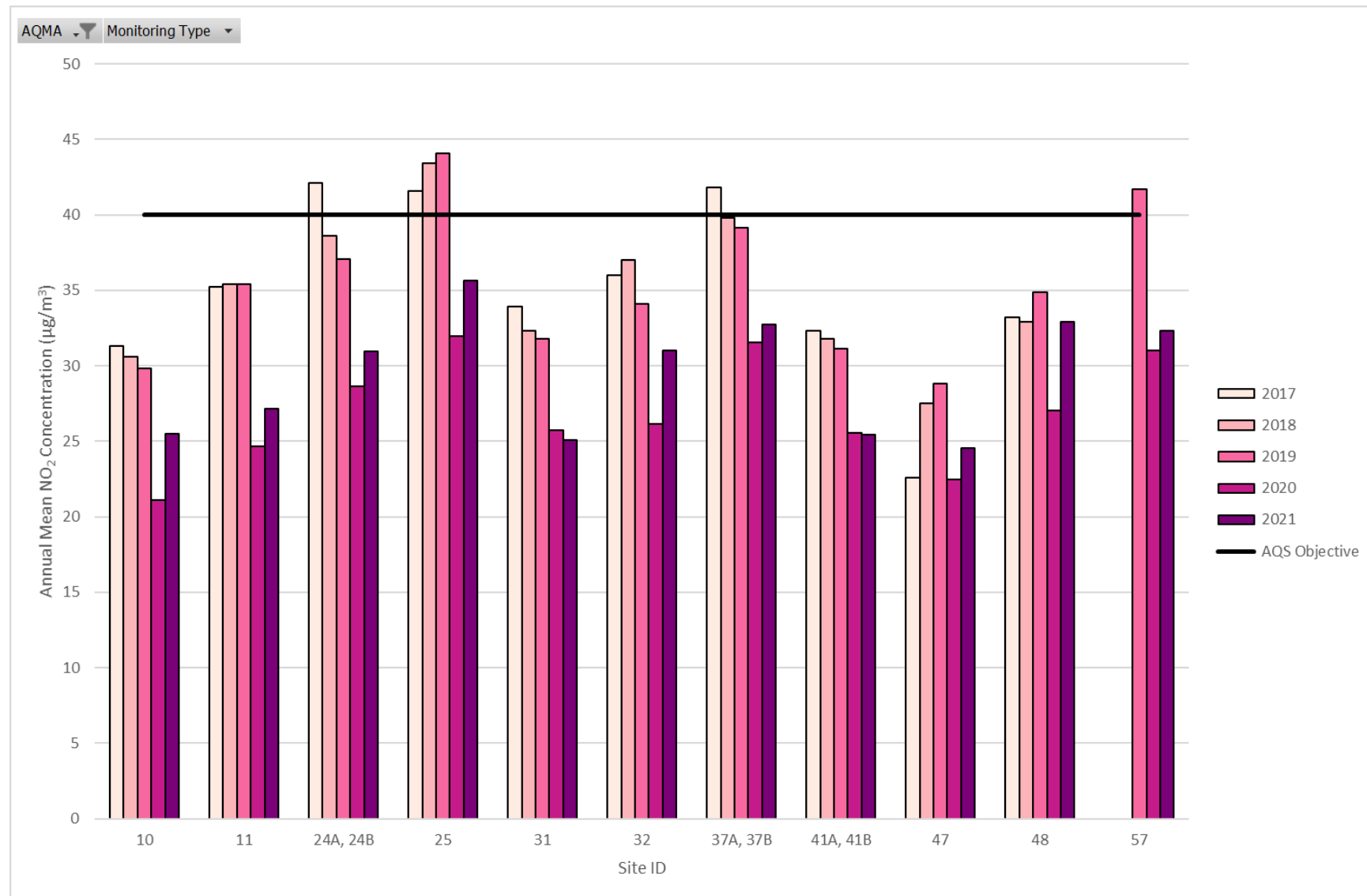


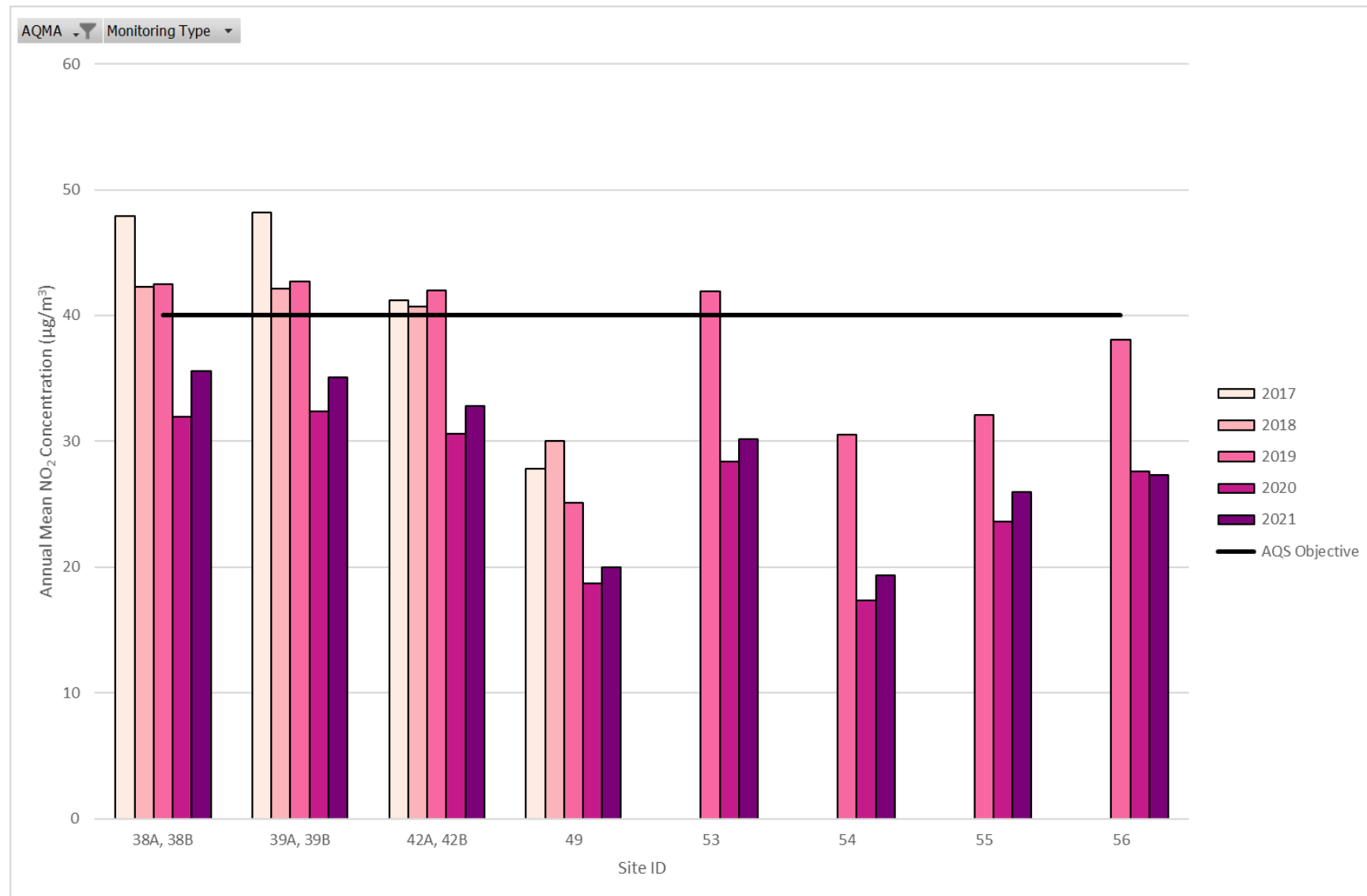
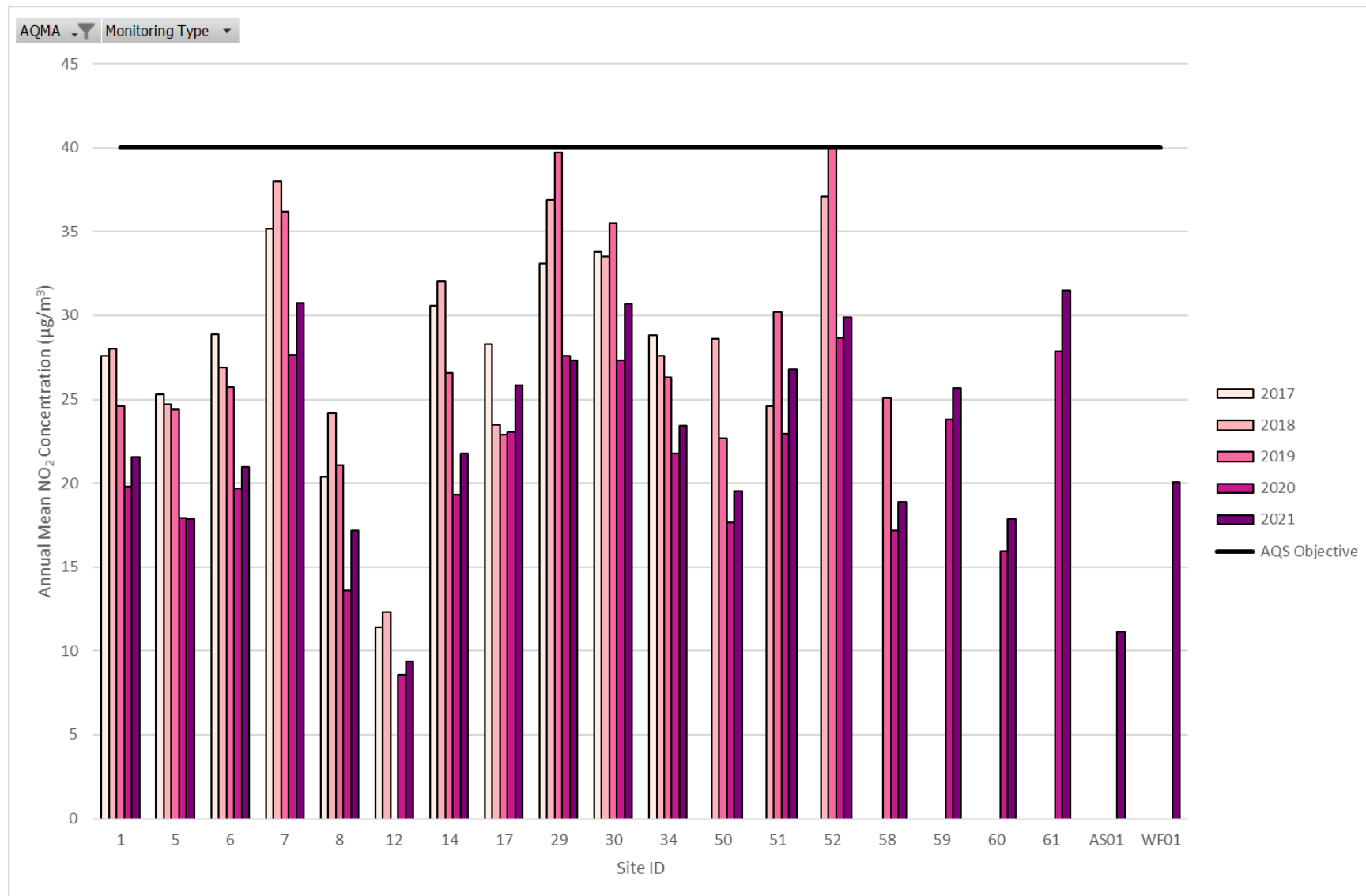
Figure A.2 – Trends in Annual Mean NO₂ Concentrations: Cellarhead AQMA

Figure A.3 – Trends in Annual Mean NO₂ Concentrations: Outside of AQMA



Appendix B: Full Monthly Diffusion Tube Results for 2021

Table B.1 – NO₂ 2021 Diffusion Tube Results (µg/m³)

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 (0.85)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
1	396535	349111	26.8	23.0	26.3	21.4	25.2	27.7	25.3	26.1	28.3	21.2	26.0	27.2	25.4	21.6	-	
5	396353	340607	18.1	19.8	19.8	15.4	25.5	I/S	16.5	19.7	26.0	25.6	22.0	23.1	21.0	17.9	-	
6	401095	339425	26.4	23.5	27.4	20.9	25.2	21.8	20.2	22.2	27.0	25.5	33.1	22.6	24.7	21.0	-	
7	400967	343564	24.4	41.6	33.9	30.9	41.7	37.6	33.9	34.6	45.6	35.7	36.3	37.6	36.2	30.7	-	
8	407237	342257	12.3	13.2	11.5	18.9	21.7	23.8	25.9	29.7	27.0	23.4	16.1	19.0	20.2	17.2	-	
10	398486	356630	66.2	27.7	27.7	18.7	25.2	24.1	23.6	27.5	30.8	28.3	32.2	27.7	30.0	25.5	-	
11	398295	356587	34.2	29.6	32.2	21.5	31.2	29.7	27.9	34.3	36.9	32.8	37.0	35.9	31.9	27.1	-	
12	397430	356516	16.2	14.3	10.5	8.5	8.0	7.3	7.5	11.2	10.3	9.9	13.8	15.2	11.1	9.4	-	
14	400990	343365	27.0	29.2	23.6	20.8	28.6	21.7	21.2	20.8	32.1	26.1	29.3	27.2	25.6	21.8	-	
17	388030	356757	36.4	26.5	30.4	27.1	I/S	29.5	30.0	30.1	33.5	27.7	33.7	29.6	30.4	25.8	-	
24A	398691	356579	33.0	31.3	35.9	28.3	37.4	34.6	34.8	36.2	42.3	37.9	42.9	37.5	-	-	-	Duplicate Site with 24A and 24B - Annual data provided for 24B only
24B	398691	356579	34.0	29.6	35.8	34.9	I/S	35.3	35.0	36.0	41.7	41.4	43.2	36.8	36.4	30.9	-	Duplicate Site with 24A and 24B - Annual data provided for 24B only
25	398354	356329	I/S	I/S	44.0	37.3	40.4	42.0	41.8	42.9	43.0	36.9	51.4	39.6	41.9	35.6	-	
29	400968	343579	32.8	35.7	31.2	23.3	36.3	28.1	27.7	27.4	37.8	35.0	35.4	35.4	32.2	27.3	-	
30	400967	343548	35.2	39.4	34.0	28.1	37.5	36.7	34.5	33.8	43.3	34.9	37.8	37.8	36.1	30.7	-	
31	398688	356547	30.0	26.7	28.9	23.9	29.7	26.1	28.0	30.4	29.9	31.2	37.6	32.0	29.5	25.1	-	
32	398693	356616	38.5	31.1	37.2	26.1	35.8	32.4	32.1	37.1	39.5	41.0	43.8	43.4	36.5	31.0	-	
34	398172	356253	33.2	29.2	28.2	21.0	26.7	22.6	22.3	24.4	30.2	29.8	33.6	29.8	27.6	23.4	-	
37A	398333	356313	39.5	34.9	41.0	38.4	38.4	38.7	35.6	38.6	41.0	37.8	46.3	36.1	-	-	-	Duplicate Site with 37A and 37B - Annual data provided for 37B only
37B	398333	356313	42.2	32.0	41.5	38.0	I/S	37.6	31.9	40.3	42.0	34.6	45.3	33.6	38.5	32.7	-	Duplicate Site with 37A and 37B - Annual data provided for 37B only
38A	395702	347548	38.1	30.0	I/S	33.0	46.8	44.3	41.7	40.5	48.7	42.8	52.5	39.1	-	-	-	Duplicate Site with 38A and 38B - Annual data provided for 38B only
38B	395702	347548	20.1	31.6	42.2	32.1	45.8	44.0	66.9	42.6	50.6	40.4	49.2		41.8	35.6	-	Duplicate Site with 38A and 38B - Annual data provided for 38B only
39A	395702	347553	27.7	27.6	42.4	32.9	45.4	43.4	73.6	42.4	47.2	44.3	50.4	38.2	-	-	-	Duplicate Site with 39A and 39B - Annual data provided for 39B only
39B	395702	347553	33.1	30.8	44.0	30.2	44.8	43.5	39.8	41.0	47.5	39.9	49.0	31.9	41.3	35.1	-	Duplicate Site with 39A and 39B - Annual data provided for 39B only
41A	398323	356306	28.5	30.5	29.7	27.0	28.9	25.7	23.9	29.9	34.5	29.4	34.7	31.3	-	-	-	Duplicate Site with 41A and 41B - Annual data provided for 41B only
41B	398323	356306	33.1	30.1	31.7	28.7	29.4		23.0	30.2	33.4	30.5	35.6	32.0	29.9	25.4	-	Duplicate Site with 41A and 41B - Annual data provided for 41B only
42A	395704	347562	29.1	31.7	40.5	32.8	42.5	I/S	39.6	39.5	47.3	43.0	50.4	39.8	-	-	-	Duplicate Site with 42A and 42B - Annual data provided for 42B only
42B	395704	347562	41.1	33.2	38.8	32.5	I/S	24.9	38.6	40.5	46.2	41.6	44.5	39.9	38.6	32.8	-	Duplicate Site with 42A and 42B - Annual data provided for 42B only
47	398245	356232	39.2	29.1	27.9	21.2	26.7	25.2	22.3	25.7	31.3	26.6	34.1	37.6	28.9	24.6	-	
48	398397	356322	37.3	36.2	31.9	28.1	36.8	I/S	57.2	32.6	38.7	I/S	52.4	36.3	38.8	32.9	-	
49	395811	347530	13.9	20.7	25.8	16.5	26.6	23.2	23.1	23.0	28.6	23.6	30.4	26.8	23.5	20.0	-	
50	401043	342917	27.3	23.4	23.3	18.0	23.2	18.7	19.6	18.1	26.0	23.8	28.2	26.2	23.0	19.5	-	
51	401062	343045	22.6	32.2	34.9	25.1	34.2	27.8	29.8	26.0	33.6	34.4	41.6	36.3	31.5	26.8	-	
52	401049	343151	35.2	31.1	36.3	28.1	38.3	29.1	33.8	31.1	40.6	33.7	45.5	39.0	35.2	29.9	-	
53	395727	347570	31.4	34.1	35.6	27.0	39.6	33.9	34.6	34.1	43.9	32.0	37.5	42.1	35.5	30.2	-	

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 (0.85)	Annual Mean: Distance Corrected to Nearest Exposure	Comment
54	395732	347575	17.7	17.8	23.3	18.5	25.8	I/S	23.3	21.4	25.9	24.4	27.6	24.6	22.8	19.3	-	
55	395754	347560	27.9	25.6	30.3	31.1	31.7	32.0	28.0	32.8	37.1	26.8	32.6	30.2	30.5	25.9	-	
56	395699	347577	34.6	26.0	35.9	23.5	40.1	33.6	24.6	32.7	43.0	28.5	31.4	32.0	32.2	27.3	-	
57	398107	356157	1.0	78.7	40.1	30.2	38.2	37.1	33.6	37.2	47.2	38.4	45.1	29.2	38.0	32.3	-	
58	395980	341065	22.9	26.6	22.0	18.1	23.4	21.4	16.9	20.7	26.9	20.8	22.8	23.9	22.2	18.9	-	
59	388054	356808	31.3	26.3	28.2	21.5	30.5	32.8	28.0	32.6	37.2	30.4	34.6	29.3	30.2	25.7	-	
60	387997	356756	25.0	22.8	20.7	18.6	19.8	17.5	15.4	19.7	23.6	19.0	24.8	25.3	21.0	17.9	-	
61	398379	356756	37.1	33.7	38.9	29.6	I/S	30.8	I/S	36.8	41.4	37.9	44.5	39.5	37.0	31.5	-	
AS01	397386	356344	20.0	14.8	11.7	9.5	10.2	9.7	I/S	9.3	I/S	I/S	17.2	15.7	13.1	11.2	-	
WF01	398537	355596	24.2	20.5	22.7	16.6	24.1	21.2	21.9	21.5	26.9	25.2	31.9	26.5	23.6	20.1	-	

☒ All erroneous data has been removed from the NO₂ diffusion tube dataset presented in Table B.1.

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

☐ Local bias adjustment factor used.

☒ National bias adjustment factor used.

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

☒ SMDC confirm that all 2021 diffusion tube data has been uploaded to the Diffusion Tube Data Entry System.

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**.

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 Staffordshire Moorlands District Council During 2021

Several new developments have been progressed in 2021. Table C.1 details a list of planning applications with its assessment reference and planning reference. If it is a major development, then SMDC are requesting that an Air Quality Assessment (AQA) shall be provided.

There were three biomass boiler applications in SMDC during 2021 with two of them having been withdrawn. SMDC are requesting that the planning permissions are subject to conditions to protect air quality. Table C.2 details a list of the biomass boiler application with the assessment reference and planning reference.

Table C.1 Details of Planning Application in SMDC during 2021

Assessment date	Assessment reference	Site location	Area	Validation Date	Planning Reference	Planning Proposal
01/10/2021	Enzygo Ltd MAN.1033.AQ.050. R.001 Ayr Road Phase 2	Land to the East of Froghall Road and North of Ayr Road, and Cheltenham Avenue, CHEADLE, STAFFORDSHIRE	Cheadle	08/12/2021	SMD/2021/0780	Reserved Matters application (access, layout, scale, appearance and landscaping) for residential development comprising 135 dwellings, with associated access, public open space and infrastructure
N/A		Reinstatement of railway track, new platform and replacement footpath on former railway line between Cornhill, Leek and boundary of existing operational railway land at Leekbrook.	Leek	18/11/2021	SMD/2021/0700	Former Railway Line, Barnfield Road, Leek, Staffordshire,
01/10/2021	Air and Acoustics Ref: 100391 Air Quality Assessment	Land at, Ash Bank Road, Werrington, Staffordshire	Werrington /Cellarhead	02/11/2021	smd/2021/0694	Development of 75 new dwellings, new access, provision of green infrastructure and all associated works
01/08/2021	SLR consultants (ref 410.10341.00003).	Land East Of, Froghall Road, Cheadle, Staffordshire	Cheadle	27/09/2021	SMD/2021/0610	Outline for up to 215 dwellings with access considered (all other matters reserved)

Assessment date	Assessment reference	Site location	Area	Validation Date	Planning Reference	Planning Proposal
01/11/2021	SLR Ref: 416.12618.00001	Site at Sandfields, Cellarhead	Cellarhead	16/07/2021	SMD/2021/0469	Resubmission of the previously refused application SMD/2021/0133 for the construction of 3No, two storey, detached houses in place of the 2No dormer bungalows previously approved under SMD/2019/045
01/12/2021	SLR Ref: 410.12602.00001	Compton Mill, Compton, Leek, Staffordshire, ST13 5NJ	Leek	02/08/2021	SMD/2021/0441	Erection of 57 no. over-65 retirement living apartments, together with external amenity space, parking and associated facilities
01/06/2021	PHASE 2, LAND AT BLYTHE VALE, BLYTHE BRIDGE Proposed Residential Development SLR Ref No: 410.09095.00005	Land South East Of A521, Uttoxeter Road, Draycott In The Moors, Staffordshire,	Blythe Bridge	02/07/2021	SMD/2021/0418	Full planning application for residential development of 200 dwellings + associated infrastructure
17/09/2021	Air Quality Assessment Oak Street, Cheadle Ref : 4851r1	Mill House, Oak Street, Cheadle, Staffordshire, ST10 1NX	Cheadle	06/04/2021	SMD/ 2021/ 0123	Conversion of existing store/workshop building to residential use
N/A	Assessment Required (Condition)	1 - 3, Market Place, Leek, Staffordshire, ST13 5HH	Leek	21/01/2021	SMD/2021/0035	Proposed change of use from use class A1, A3 and A4 (2020 use class E and sui

Assessment date	Assessment reference	Site location	Area	Validation Date	Planning Reference	Planning Proposal
						generis) shops, offices, food/drink establishment to residential use class C3(upper floor accommodation) and part A1,A3 and A4 (2020 use class E and sui generis) shop (retail), pub and food/drink establishment. (ground floor accommodation only).
N/A	Assessment Required (Condition) - refused	Land at Former Bolton's Copperworks, Froghall Road, Froghall, Staffordshire, ST10 2HH	Froghall	08/02/2021	SMD/2020/0684	Residential development (49 dwellings), including formation of new access, landscaping and associated works, and restoration of listed farmhouse and re-use as a dwelling house.
29/10/2020	Knypersley Power Ltd STOR "Peaking" Power Plant – Air Quality Assessment	Plot 3, Brown Lees Road Industrial Estate Forge Way, Knypersley	Biddulph	03/11/2020	smd/2020/0611	Proposed refurbishment of existing reserve power generation facility including the removal of redundant equipment and plant and replacement with new plant and ancillary infrastructure.

Assessment date	Assessment reference	Site location	Area	Validation Date	Planning Reference	Planning Proposal
	Condition Reccomended	Land South Of, Thorley Drive, Cheadle, Staffordshire	Cheadle	14/10/2020	SMD/2020/0502	Outline planning permission with all matters reserved for residential develeopment of up to 40 dwellings and associated works - <i>Not yet determined</i>
24/10/2018	AIR QUALITY ASSESSMENT CHEADLE NORTH STRATEGIC DEVELOPMENT AREA REC REFERENCE: AQ105750R1	Land to the East of Froghall Road and North of Ayr Road, and Cheltenham Avenue, CHEADLE, STAFFORDSHIRE,	Cheadle	22/03/2018	SMD/2018/0180	Hybrid planning application on land east of Froghall Road and north of Ayr Road/Cheltenham Avenue, Cheadle seeking 1) full permission for 125 dwellings and access to proposed primary school and 2) outline permission for up to 135 dwellings and primary school with all matters reserved.
27/10/2019	0 AIR QUALITY MEMORANDUM	Land to the East of Froghall Road and North of Ayr Road, and Cheltenham Avenue, CHEADLE, STAFFORDSHIRE,	Cheadle	24/03/2018	SMD/2018/0181	Hybrid planning application on land east of Froghall Road and north of Ayr Road/Cheltenham Avenue, Cheadle seeking 1) full permission for 125 dwellings and access to proposed primary school and 2) outline permission

Assessment date	Assessment reference	Site location	Area	Validation Date	Planning Reference	Planning Proposal
						for up to 135 dwellings and primary school with all matters reserved.
01/01/2016	Mayer Brown: AQ Assessment Thorley Drive	Land South Of, THORLEY DRIVE, CHEADLE, STAFFORDSHIRE	Cheadle	10/02/2016	SMD/2016/0083	Outline application with all matters reserved (except access) for residential development of up to 60 dwellings together with new access and associated works
01/10/2018	AQC - Further Information	Land South East Of A521, A50 Blythe Bridge Bye Pass, Blythe Bridge, Staffordshire,	Blythe Bridge	13/01/2020	DOC/2018/0138	Discharge of conditions 4, 6, 7, 8, 13, 18, 21, 22, 33, 34. Ref SMD/2017/0512
01/10/2018	Air Quality Monitoring Strategy: Land At Blythe Vale, Blythe Bridge	Land South East Of A521, A50 Blythe Bridge Bye Pass, Blythe Bridge, Staffordshire,	Blythe Bridge	13/01/2020	DOC/2018/0138	Discharge of conditions 4, 6, 7, 8, 13, 18, 21, 22, 33, 34. Ref SMD/2017/0512
01/10/2017	AQC Air Quality Assessment: Land At Blythe Vale, Blythe Bridg	Land South East Of A521, A50 Blythe Bridge Bye Pass, Blythe Bridge, Staffordshire,	Blythe Bridge	01/08/2017	SMD/2017/0512	Detailed Planning Application for the development of 118 dwellings (Use Class C3), new access and internal roads for vehicles, pedestrian and cycle linkages; car and cycle parking; associated play and open

Assessment date	Assessment reference	Site location	Area	Validation Date	Planning Reference	Planning Proposal
						space, landscaping, ecological habitats; sustainable drainage measures, earthworks and all ancillary enabling works including the demolition of building and structures.

Table C.2 Details of Biomass Boiler Planning Application in SMDC during 2021

Assessment date	Assessment reference	Site location	Area	Validation Date	Planning Reference	Planning Proposal
	N/A Withdrawn	Bird Grove Farm, Sandon Road, Hilderstone, Staffordshire, ST15 8SL	Cresswell	29/09/2021	SMD/2021/0625	Installation of eight biomass boilers and associated equipment and the erection of a lean-to biomass boiler shed, associated wood fuel stores, alterations to hay barn, and formation of permeable stone hardstanding area
	N/A Withdrawn	Felthouse Farm, Cheadle Road, Cheddleton, Staffordshire, ST13 7BG	Cheddleton	25/08/2021	SMD/2021/0564	Alterations to existing plant storage building to form biomass boiler housing and wood chip store
	Assessment Conditioned	Lower Whitemore Farm, Congleton Road, Biddulph, Staffordshire, CW12 3NF	Biddulph	04/05/2021	SMD/2021/0220	Proposed replacement dwelling and outbuildings Biomass boiler

Additional Air Quality Works Undertaken by Staffordshire Moorlands District Council During 2021

Air Aware Project

The Air Aware Project is a joint project between SCC and SMDC and other Staffordshire districts supported by a Defra grant, and council funding and aimed to provide, school engagement, business engagement, and a communications campaign to raise awareness of air quality issues, across the district. The initial grant ran from 2019 to 2020, and built up significant local momentum, particularly with local schools, although the role programme was affected by the Covid pandemic and associated restrictions.

In April 2021, SMDC, in partnership with Staffs County Council, Cannock Chase District Council, and East Staffordshire Borough Council were successful in obtaining a Defra grant to continue with the funding of the Air Aware.

Phase 2 of the Air Aware project is intended to focus further on the schools and community (small businesses) engagement programme but also to increase public awareness.

The school engagement in has targeted areas where school traffic impacts on AQMA areas. Engagement includes

- Providing School assemblies on air quality,
- Active travel campaigns through an academic annual calendar,
- Accreditation of schools through STARS travel planning,
- Anti-idling campaigns to get parents to “switch off when they drop off”
- Provision of walking bus co-ordinators

In 2021 there were 7 Leek Schools engaged in the air aware Campaign.

The business engagement in has targeted areas where business traffic impacts on AQMA areas and offers businesses a variety of options for engagement with the Air Aware team, based on their size, location and contribution to the local issue.

In 2021 the launch meeting (held via Teams) consisted of 10 businesses based in Leek, including some of the larger employers (such as Ornuo foods), who are now engaging in producing travel surveys and committing to improving Air Quality.

Two public events were also held in the district in conjunction with climate change:

- COP26

- Moorlands Climate Action

A New electric travel van has been purchased for the project, and branded to raise awareness, encourage take up and increase confidence in electric vehicles.

Figure C.1 COP26 Event in Leek



Staffordshire Live Labs – Cellarhead AQMA

Staffordshire Live Labs is a £1.95 million programme, funded by Department for Transport through ADEPT (Association of Directors for Economy, Environment, Planning and Transport). The programme has created a challenge fund for SMEs to bid into to trial and test innovative solutions to help solve the 2 challenges faced in Staffordshire – improving air quality and mobility.

At the Cellarhead junction, an innovation to use fibre cables has been instigated that to detect vibrations from vehicles and pedestrians, using this data to monitor and detect traffic queues developing at the Cellarhead crossroad and relate this to 4 real time (indicative) AQ monitors. The project was initiated 2020 and has continued through 2021, early results indicate the system can be used to detect the movement of vehicles approaching a junction and priorities their movement to improve AQ. The project is due to finish in 2022 with the final AQ impact report expected towards the end of 2022.

QA/QC of Diffusion Tube Monitoring

The diffusion tubes for the year 2021 were supplied and analysed by Staffordshire Scientific Services, the tubes were prepared using the 20% TEA in water preparation method. All results have been bias adjusted and annualised where required before being presented in Table A.1.

Staffordshire Scientific Services is a UKAS accredited laboratory and participates in the AIR-PT Scheme for NO₂ tube analysis and the Annual Field Inter-Comparison Exercise. These provide strict performance criteria for participating laboratories to meet, thereby ensuring NO₂ concentrations reported are of a high calibre. The latest available AIR-PT results are AIR-PT AR042 (January – February 2021), AIR-PT AR043 (May – June 2021), AIR-PT AR04 (July – August 2021) and AIR-PT AR046 (September – October 2021). Staffordshire Scientific Services scored 100% on all four PT rounds. The percentage score reflects the results deemed to be satisfactory based upon the z-score of $< \pm 2$.

The precision of the 14 current local authority co-location studies (out of 15 in total) in 2021 detailed within the national bias adjustment factor spreadsheet (version 06/22) was rated as 'good' (tubes are considered to have "good" precision where the coefficient of variation of duplicate or triplicate diffusion tubes for eight or more periods during the year is less than 20%).

Diffusion tube monitoring during 2021 was undertaken in line with the Diffusion Tube Monitoring Calendar and recommended exposure period (5 weeks (+/- 4 days)).

Diffusion Tube Annualisation

All diffusion tube monitoring locations within SMDC recorded data capture of 75% therefore it was not required to annualise any monitoring data. According to TG22, 75% data capture is equivalent to 9 months of monitoring assuming monitoring has been completed in line with the Defra monitoring calendar. In addition, any sites with a data capture below 25% do not require annualisation.

Diffusion Tube Bias Adjustment Factors

The diffusion tube data presented within the 2021 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.TG16 provides guidance with regard to 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/NO₂ continuous analysers. Alternatively, the national database of diffusion tube co-location surveys provides bias factors for the relevant laboratory and preparation method.

SMDC have applied a national bias adjustment factor of 0.85 to the 2021 monitoring data. A summary of bias adjustment factors used by SMDC over the past five years is presented in Table C.3.

- SMDC do not have any co-location studies within the borough, therefore data is not available to derive a local bias factor and the National Bias Adjustment Factor Spreadsheet¹¹ has been used.

Figure C.2 National Bias Adjustment Factor

National Diffusion Tube Bias Adjustment Factor Spreadsheet				Spreadsheet Version Number: 06/22			
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 September 2022			
Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods				LAQM Helpdesk Website			
Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet				Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.			
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							
Step 1: Select the Laboratory that Analyses Your Tubes from the Drop-Down List				Step 4: 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 ² shown in blue at the foot of the final column.			
If a laboratory is not shown, we have no data for this laboratory.				If you have your own co-location study then see footnote ¹ . If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@bureauveritas.com or 0800 0327953			
Step 2: Select a Preparation Method from the Drop-Down List				Step 3: Select a Year from the Drop-Down List			
If a preparation method is not shown, we have no data for this method at this laboratory.				If a year is not shown, we have no data ²			
Analysed By ¹				Method			
To undo your selection, choose (All) from the pop-up list				To undo your selection, choose (All)			
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 ¹				Bias Adjustment Factor (A) (Cm/Dm)			
Staffordshire Scientific Services				20% TEA in water			
2021				Overall Factor ² (15 studies)			
				Use			
				0.85			

Table C.3 – Bias Adjustment Factor

Monitoring Year	Local or National	If National, Version of National Spreadsheet	Adjustment Factor
2021	National	06/22	0.85
2020	National	09/21	0.85
2019	National	09/20	0.93
2018	National	06/19	0.89
2017	National	06/19	0.88

NO₂ Fall-off with Distance from the Road

Wherever possible, monitoring locations are representative of exposure. However, where this is not possible, the NO₂ concentration at the nearest location relevant for exposure has been estimated using the Diffusion Tube Data Processing Tool/NO₂ fall-off with distance calculator available on the LAQM Support website. Where appropriate, non-

¹¹ National Diffusion Tube Bias Adjustment Factor Spreadsheet version 06/22 available at <https://laqm.defra.gov.uk/air-quality/air-quality-assessment/national-bias/>

automatic annual mean NO₂ concentrations corrected for distance are presented in Table B.1.

No diffusion tube NO₂ monitoring locations within SMDC required distance correction during 2021.

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

Figure D.1 – NO₂ Diffusion Tube Monitoring Locations: Leek AQMA

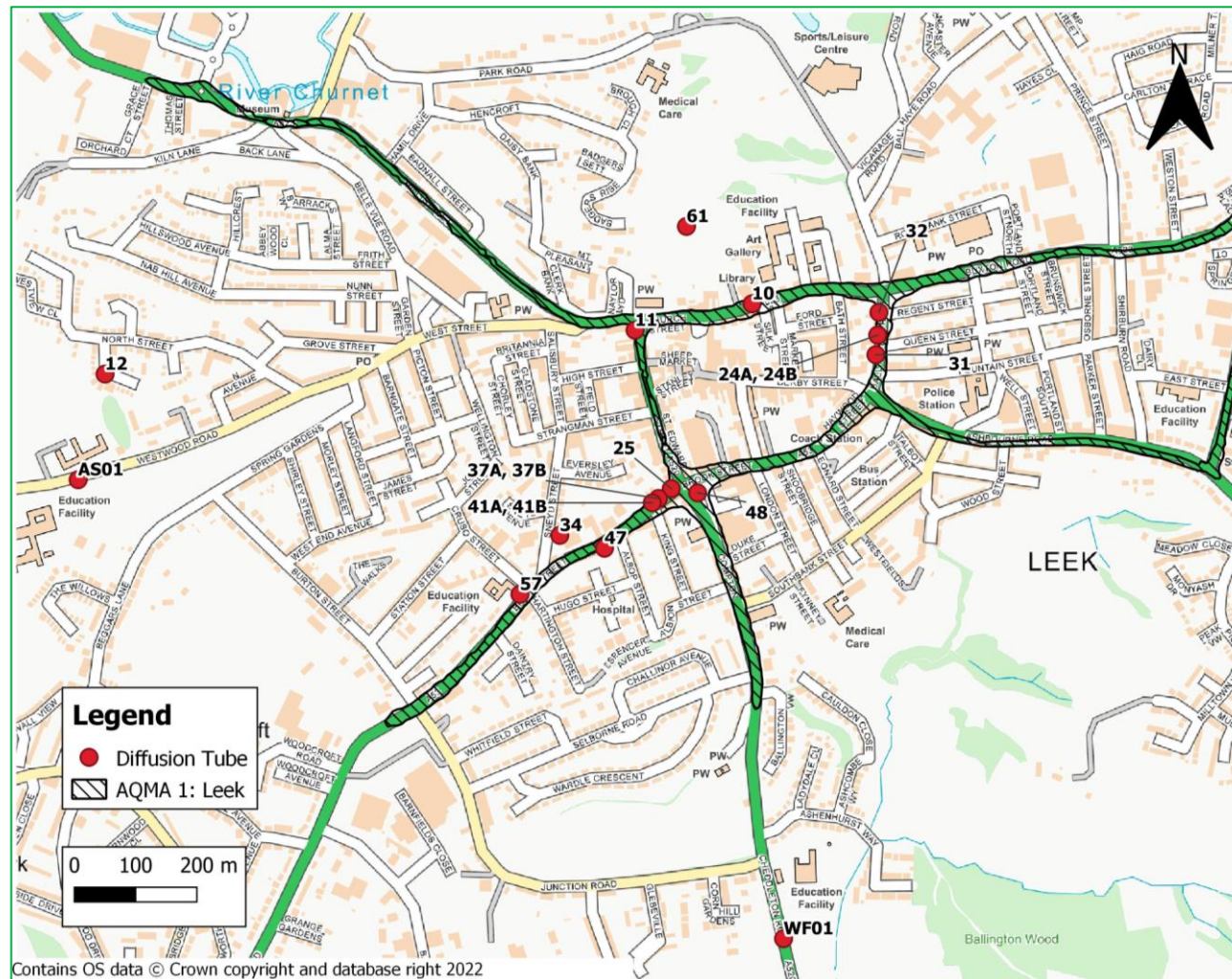


Figure D.2 – NO₂ Diffusion Tube Monitoring Locations: Cellarhead AQMA

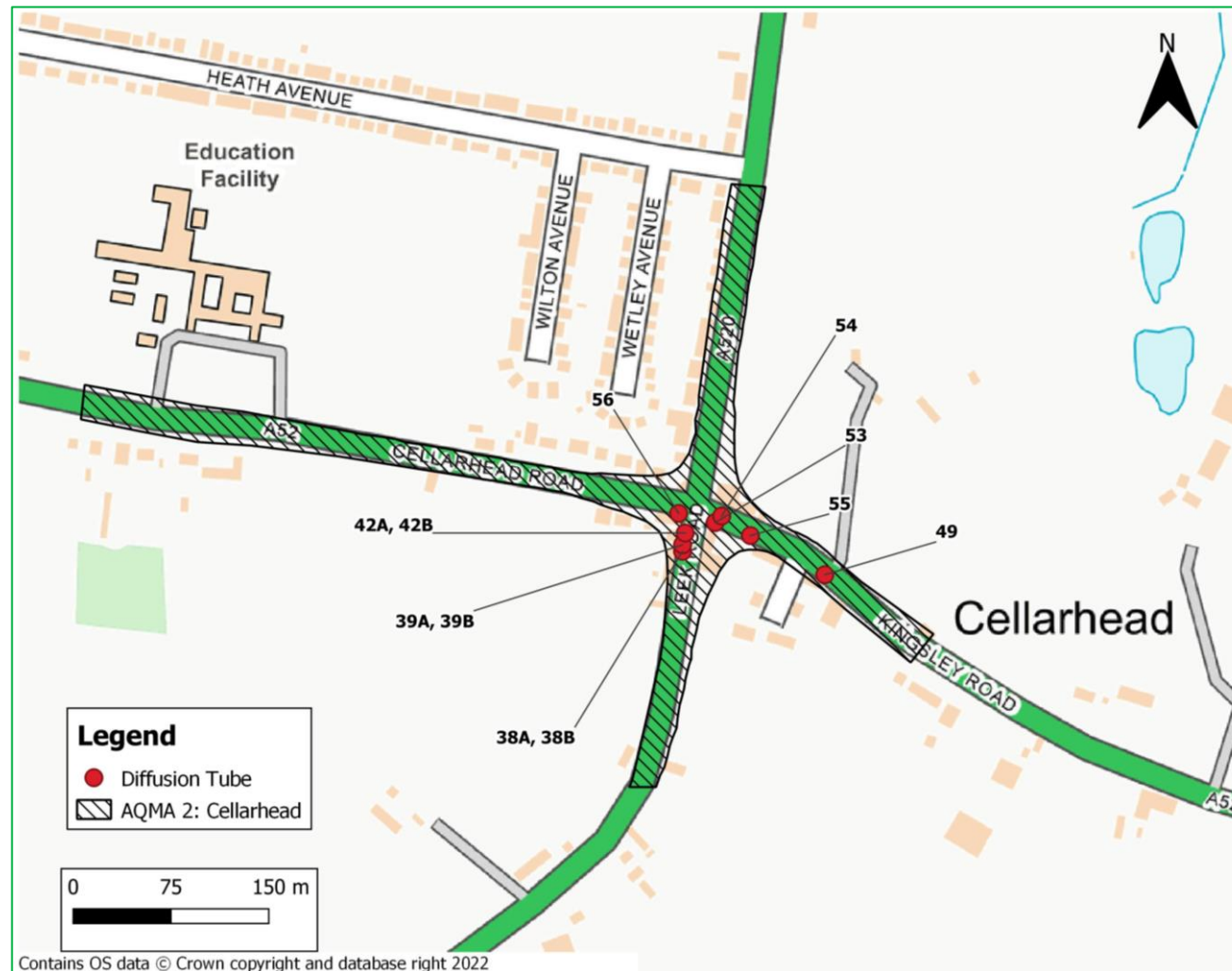


Figure D.3 – NO₂ Diffusion Tube Monitoring Locations: Alton

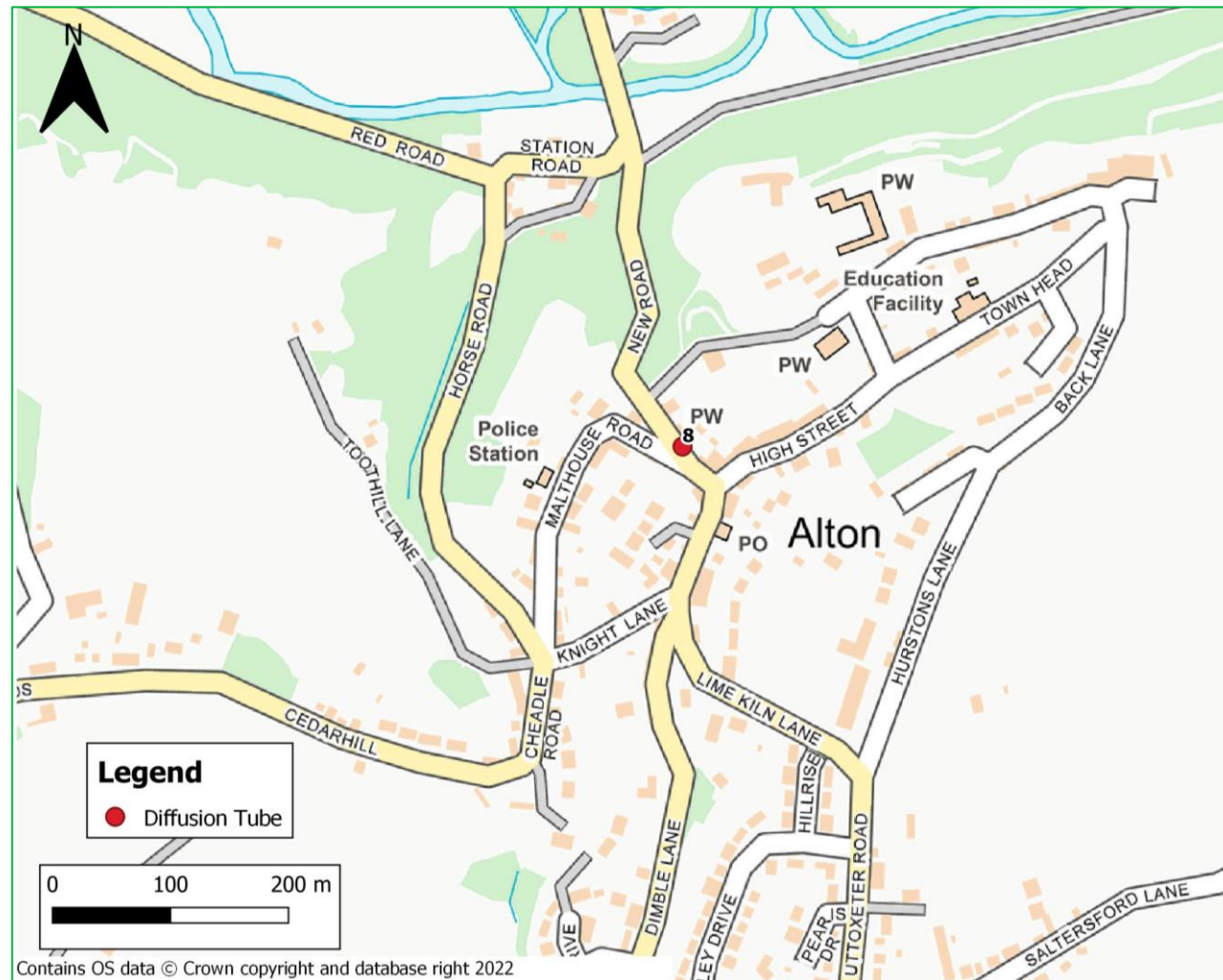


Figure D.4 – NO₂ Diffusion Tube Monitoring Locations: Blythe Bridge

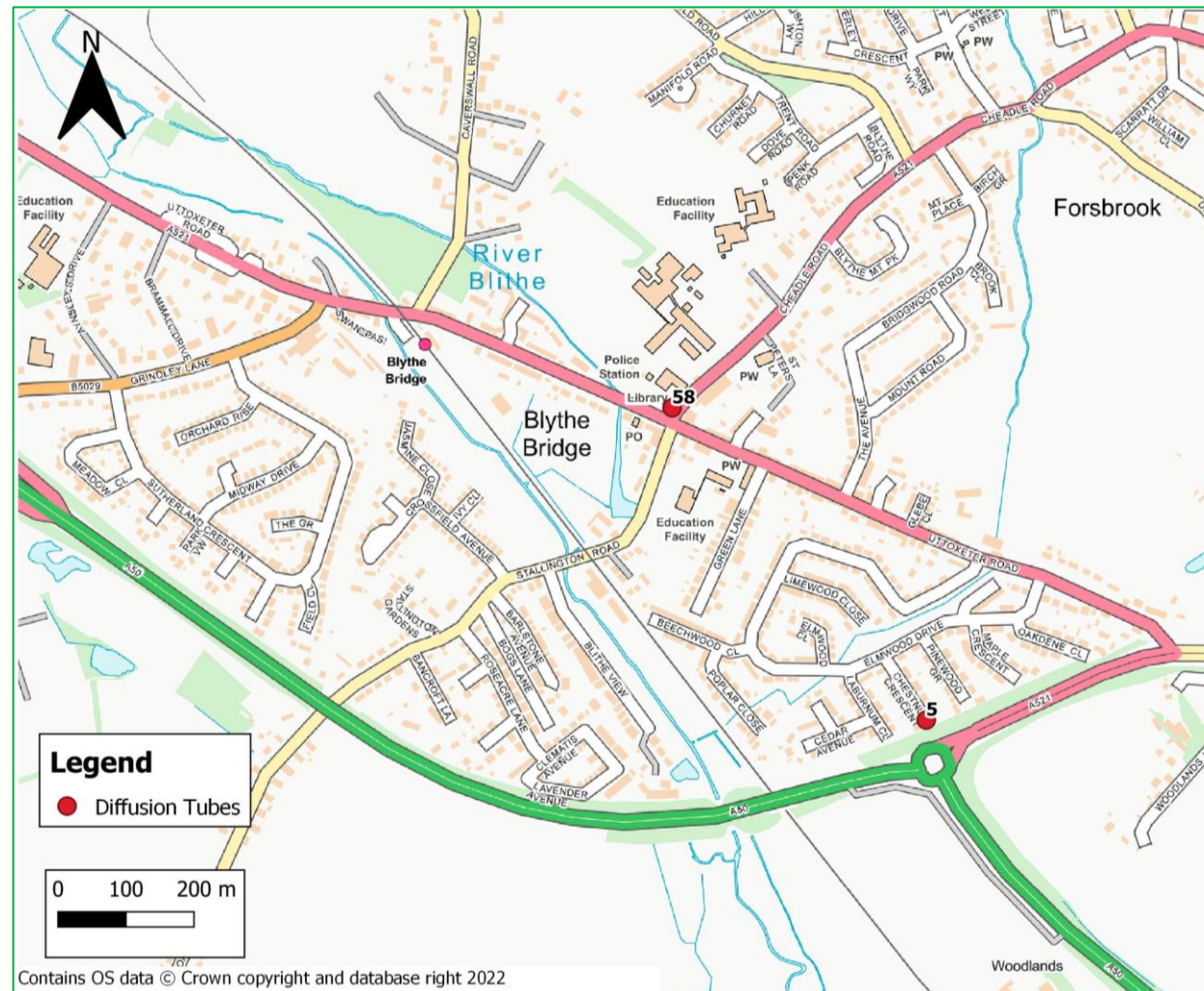


Figure D.5 – NO₂ Diffusion Tube Monitoring Locations: Cheadle

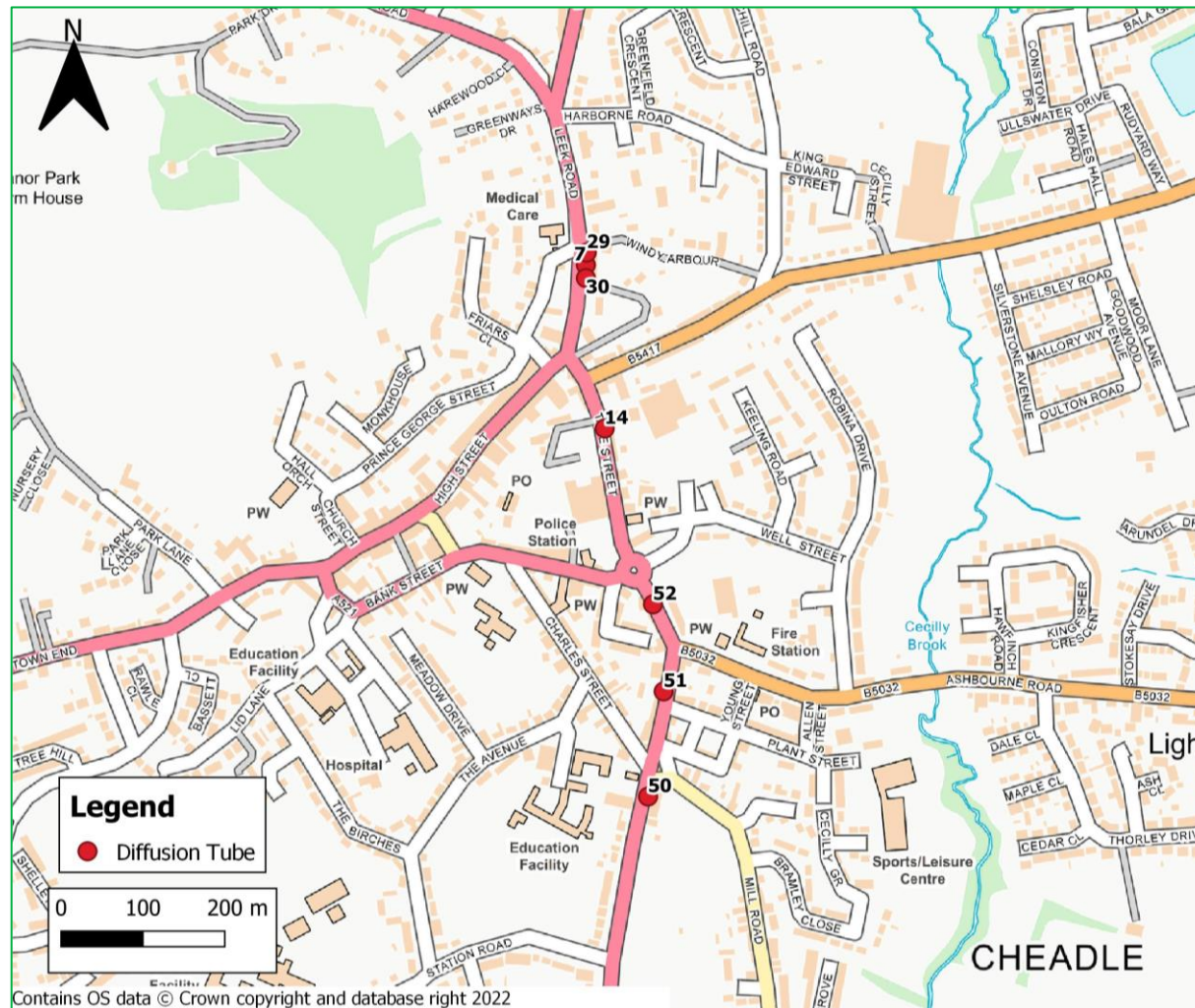


Figure D.6 – NO₂ Diffusion Tube Monitoring Locations: Newpool and Knowle Style

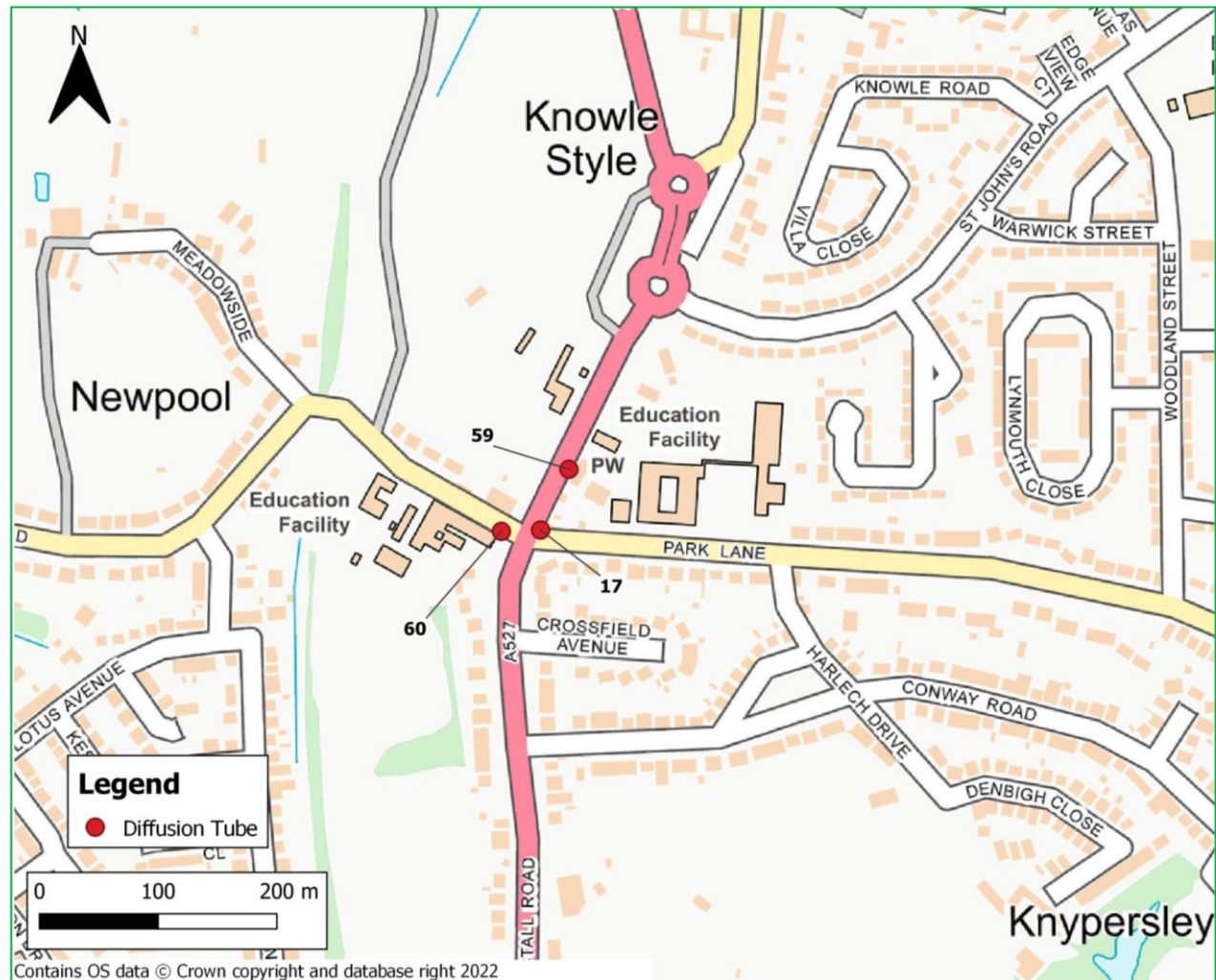


Figure D.7 – NO₂ Diffusion Tube Monitoring Locations: Upper Tean

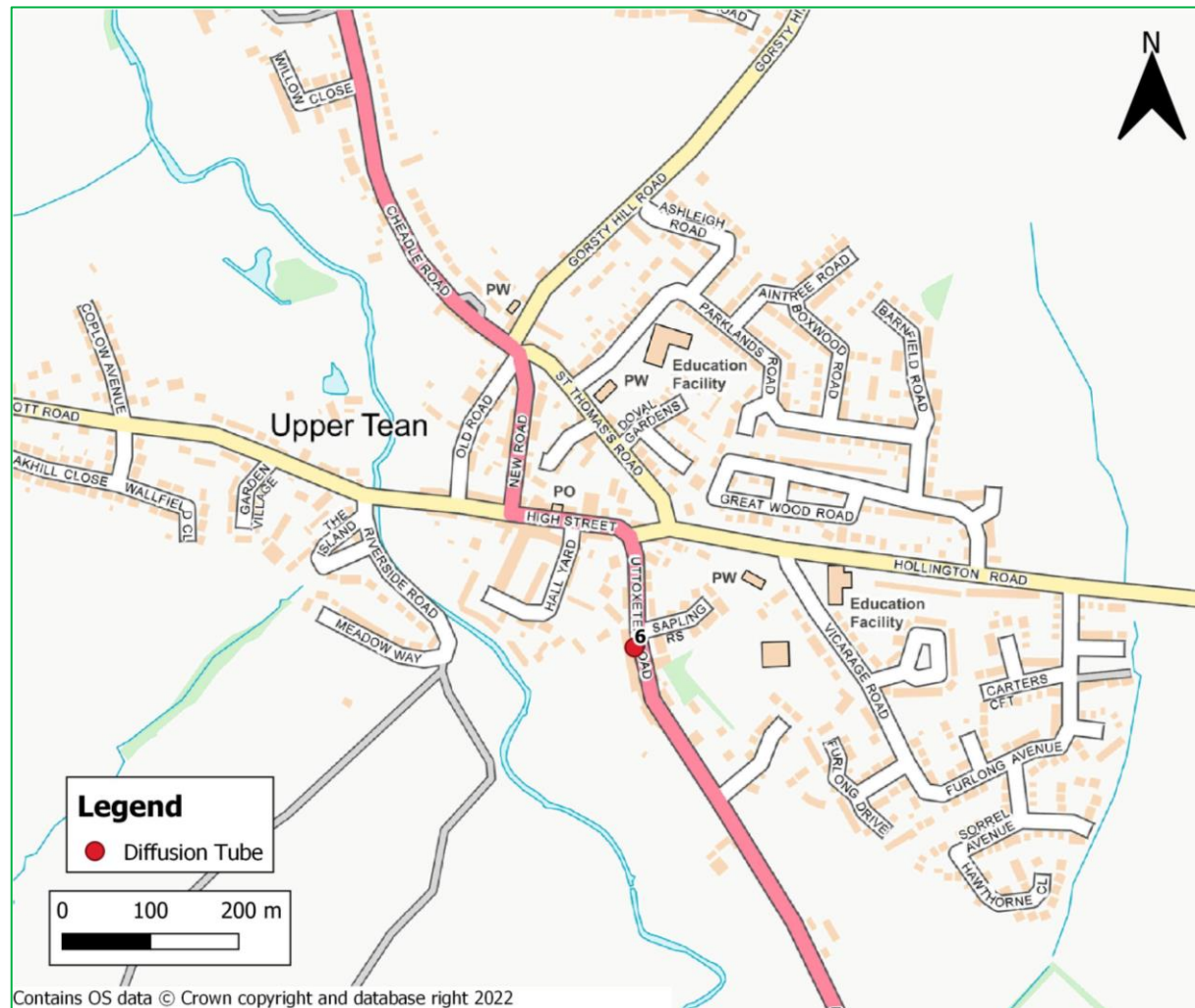
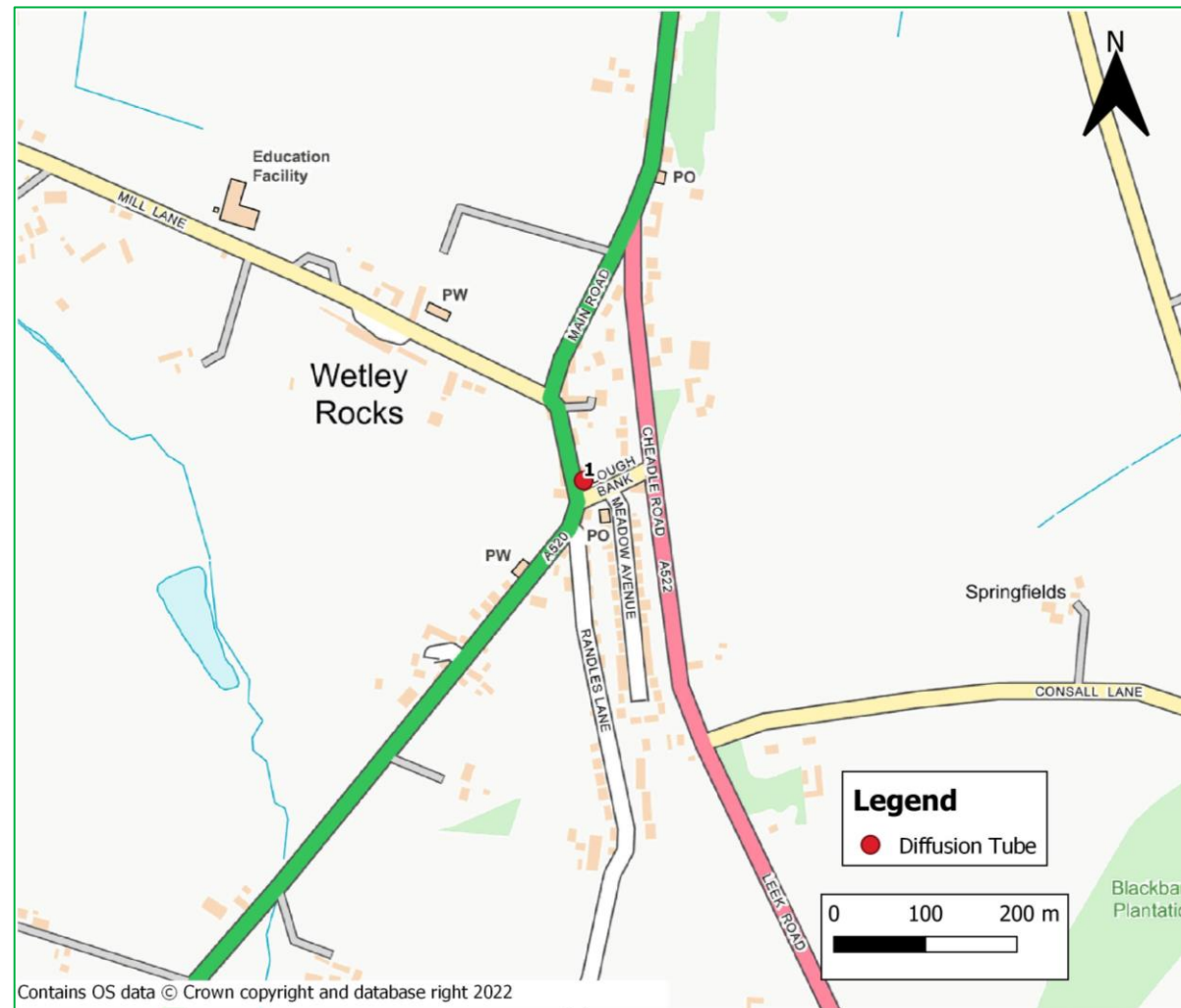


Figure D.8 – NO₂ Diffusion Tube Monitoring Locations: Wetley Rocks



Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England¹²

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

¹² 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	Annual Status Report
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by National Highways
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
SMDC	Staffordshire Moorlands District Council
SCC	Staffordshire County Council
HPBC	High Peak Borough Council

References

- Local Air Quality Management Technical Guidance LAQM.TG16. April 2021.
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Local Air Quality Management Technical Guidance LAQM.TG22. August 2022.
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. August 2022.
Published by Defra in partnership with the Scottish Government, Welsh Assembly Government and Department of the Environment Northern Ireland.
- Staffordshire Moorlands District Council 2019 Annual Status Report.
- Staffordshire Moorlands District Council 2020 Annual Status Report.
- Staffordshire Moorlands District Council 2021 Annual Status Report.
- National Diffusion Tube Bias Adjustment Factor Spreadsheet, published June 2022.
- Diffusion Tube Data Processing Tool version 2.0 March 2022, Defra.
- Staffordshire Moorlands District Integrated Transport Strategy 2018 – 2031, published October 2018.