2020 Air Quality Annual Status Report (ASR)

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

June 2020

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Report reference number	ASR2020
Date	30/06/2020

Executive summary: air quality in Allerdale Borough 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 and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas[1,2].

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion[3].

Allerdale has relatively low levels of pollution due to the rural nature of the area, however Allerdale Borough Council acknowledges that both urban and rural areas are constantly threatened by pollution from human activities.

In 2019 monitoring of Nitrogen Dioxide was carried out in Allerdale via diffusion tube monitoring sites. The sites were positioned at 12 locations across Allerdale deemed to be most affected by road traffic pollution. As with previous years of monitoring the 2019 data demonstrates Nitrogen Dioxide levels are well below the national objectives. The observed overall trends for 2019 show that levels of Nitrogen Dioxide are generally reducing in most areas.

The main pollutant of concern for Allerdale Borough Council is Nitrogen Dioxide (NO_2) which is predominantly associated with road traffic sources and other transport links. Other pollutants of concern include Particulate Matter in the form of PM_{10} and $PM_{2.5}$. Allerdale Borough Council takes a proactive approach to tackling these pollutants via smoke control areas, environmental permitting, planning requirements and regulatory duties under the Clean Air Act. Data from 2017 that has been collated and modelled by Public Health England (PHE) and shows Cumbria to have the lowest human exposure to fine particulate matter (in the form of PM_{10} and $PM_{2.5}$) across North West of England (PHOF, 2017; PHOF, 2018).

Allerdale Borough Council does not currently sample for SO_2 however brief studies and screening were previously carried out in relation to identifying possible SO_2 hotspots in 2017. This initial screening discounted the need for detailed assessment in relation to SO_2.

Allerdale Borough Council works closely with neighbouring local authorities as well as Cumbria County Council, Environment Agency, Natural England and Public Health England to regulate and reduce air pollution. Including the recent publication of the Joint Public Health Strategy 2019 which is inclusive of the effects of air pollution in the community (Cumbria County Council, 2019).

Overall due to the good quality of our air demonstrated by monitoring and data gathered, there are no requirements for any Air Quality Management Areas (AQMA) in Allerdale at the time of reporting. Allerdale Borough Council recognises the increasing significance of maintaining good air quality for the good health of the community and will continue to pursue further proactive improvements where possible.

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

Actions to improve air quality

Allerdale Borough Council works to monitor and understand local air quality sources by using appropriate monitoring locations within the council boundary and taking appropriate actions.

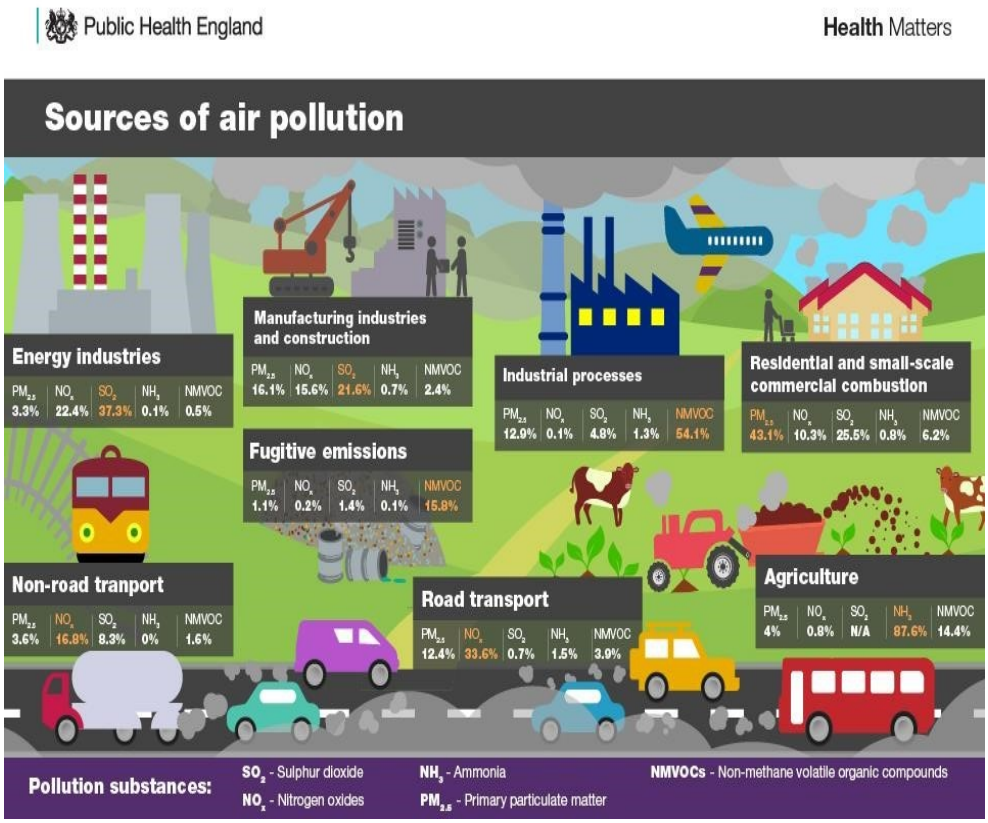

Image: Sources of air pollution (Public Health England, 2018)

The Council Strategy introduced for 2020 -2030 places an emphasis on a cleaner and greener Allerdale. With commitments to resilience communities by the effective delivery of functions to keep people safe and well, with reference to air quality. To read more please see: https://wwwcloudfront.allerdale.gov.uk/media/filer_public/ce/53/ce5392c0-3366-4e92-b00a1a68328f3a26/council-strategy_2020-30_final.pdf.

Measures to improve air quality are included in Allerdale Borough Council's Local Plan where air quality is an important consideration with planning applications.

Image: Use of electric vehicle available to staff members to complete council functions including air quality monitoring

Image: Air quality promotion and other environmental health issues at Taste Cumbria, September 2019

Preparations with partners within the community for Clean Air Day 2020 to build upon the success of the 2019 event has now been postponed to October 2020 due to COVID-19. However, messages of the importance of collective action to improve outdoor and indoor air pollution has been delivered through Allerdale Borough Council's communications.

Image: Allerdale Waste Services was established in 2020 working with Tivoli

Allerdale Waste Services cover refuse waste collections for the Allerdale region. This company was established in 2020. In terms of Fleet vehicles, 18 of the vehicles are owned by Allerdale Waste Services that meet Euro 6 Emissions Standards. There are another 8 vehicles hired by the Allerdale Waste Services Company. Four of these are Euro 6 with the other 4 being Euro 5 Emissions standards. There are no electric vehicles in the fleet at the time of this report.

Following on from the 2019 Annual Status Report last year, two small pedestrian electrical sweepers are now in use and battery powered equipment is currently being trialled by Tivoli, the grounds maintenance provider. With the intention to continue to implement these changes within the following years to achieve their goal of using more battery powered handheld equipment. By completing this measure, it is it is anticipated that such attempts will significantly reduce air pollution, emissions and improve Tivoli's carbon footprint. At the time of writing, Tivoli currently has 11 fleet vehicles that meet Euro 6 Emission Standards and a further 9 fleet vehicles that meet Euro 5 Emissions Standards.

Left: A66/A595 Bridgefoot Roundabout; right: A66/A595 Papcastle Roundabout

Highways England improvement works in 2019 including widening of carriageway, drainage works, and improvements to footways/cycle ways was completed in 2020. Other infrastructure changes within the County have included the resumption of commercial domestic flight operations at Carlisle Lake District Airport in 2019. Air quality monitoring is undertaken in close proximity to the airport by Carlisle City Council and to date has been identified as not meeting the criterion regarding Nitrogen Dioxide exceedances (Carlisle City Council, 2019).

Conclusions and priorities

Overall, the results from 2019 show NO_2 annual mean concentrations within Allerdale Borough Council remain generally unchanged at the majority of monitoring sites when compared to 2018 results.

Many monitoring locations have experienced minor reductions in NO_2 levels during 2019, in particular at Main Street, Keswick and a reduction of 3.5□g/m^3 compared to 2018 results for Ramsay Brow, Workington (See Figure A.1.). Minor gradual increases in NO_2 levels have continued at King Street, Wigton with a minor increase at Hall Park View, Workington. No exceedances of the annual mean Nitrogen Dioxide Air Quality Objective were identified with no Air Quality Management Area(s) needing to be declared during 2019. In general, Allerdale Borough Council has very good air quality as demonstrated from the monitoring within this report. Allerdale Borough Council continue to proactively manage potential air quality impacts from major developments both individually and collectively. With detailed air quality assessments required from developments via the planning process when necessary. Allerdale Borough Council are committed to maintaining and improving the air quality within this region with relevant stakeholders.

Allerdale's main priority continues to work on our commitments and objectives of DEFRA's 2019 Clean Air Strategy and relevant legislation to encourage positive behaviour change. In addition, explore funding opportunities regarding widening the number of other pollutants monitored. Allerdale Borough Council will continue to review air quality by the introduction and decommissioning of new monitoring sites in relation to increased road traffic and rail traffic associated with future and planned major developments.

Local engagement and how to get involved

Air pollution is a local issue. It comes from local sources, it has local health impacts, and it can be tackled by collective local action.

From public engagement events and social media communications, it appears that the level of interest and awareness is growing in particular with national Climate Change movements during 2019. Recently, a Climate motion was agreed to make Allerdale Carbon Neutral by 2030 if possible.

As a resident of Allerdale Borough Council you can help make a positive difference to improve air quality:

- Where possible consider public transport, walking, or cycling to reduce emissions. The Visit Allerdale webpage having worked with Sustrans contains a collection of various cycle and walking routes across this region: https://visitallerdale.co.uk/things-to-do/road-cycling-routes-in-allerdale/
- If purchasing a car, consider a vehicle with the lowest exhaust emissions and the electronic car grants available: https://www.gov.uk/plug-in-car-van-grants
- If installing or replacing an existing wood burning stove consider purchasing a stove that is approved for use in an Allerdale Smoke Control Area or an EcoDesign Ready Stove by visiting: https://www.allerdale.gov.uk/en/yourenvironment/smoke/
- Make clean air decisions in your home. From ventilation, only burning dry-well seasoned or smokeless fuel, chose low volatile organic compounds and fragrance-free cleaning products
- Partake in public consultations regarding developments within Allerdale
- To learn more information about the facts on air quality: https://www.cleanairhub.org.uk/clean-air-information
- For further information about air quality in Allerdale visit: https://www.allerdale.gov.uk/en/your-environment/air-quality/
- Businesses and the community interested in future Clean Air Day events please contact to register your interest: environmental.health@allerdale.gov.uk

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Local air quality management

This report provides an overview of air quality in the Allerdale Borough Council region during 2019. 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 Allerdale Borough Council to improve air quality and any progress that has been made.

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

Actions to improve air quality

Air quality management areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives. Allerdale Borough Council currently does not have any AQMAs. Allerdale Borough Council has not identified from monitoring in 2019 or previous years any exceedance of the air quality objective and therefore no AQMAs have been declared. For reference, a map of Allerdale Borough Council's monitoring locations is available in Appendix D.

Progress and impact of measures to address air quality in Allerdale Borough Council

Defra's appraisal of last year's ASR concluded:

The Report sets out the Annual Status Report, which forms part of the Review & Assessment process required under the Environment Act 1995 and subsequent Regulations.

Allerdale Borough Council does not currently have any declared air quality management areas (AQMAs) and so is not required to produce an air quality action plan (AQAP). However, the Council does have 23 measures to improve air quality. The Council undertook non-automatic NO_2 diffusion tube monitoring at 11 sites in 2018, an increase of 1 from 2017, which were all duplicated diffusion tube sites. There were no measured exceedances of the air quality objectives (AQO) at any monitoring site and the highest measured NO_2 concentration in 2018 was 32 µg/m^3 at DTS6, Ramsay Brow, Workington. The air quality within the Borough is generally good with concentrations far below the AQOs. The Council is also proposing a number of new monitoring sites to monitor worst case locations for air pollution within the borough.

There are a number of local developments discussed within the report along with discussion on local $PM_{2.5}$ emissions and a number of measures to address these emissions. The Council clearly sets out its priorities for the next reporting year stating that its first priority is to act on objectives within the 2019 Clean Air Strategy.

On the basis of the evidence provided by the local authority the conclusions reached are acceptable for all sources and pollutants.

Following the completion of this report, Allerdale Borough Council should submit an Annual Status Report in 2020.

Commentary

The report is well structured, detailed, and provides the information specified in the Guidance. The following comments are designed to help inform future reports.

- Consider commenting on background continuous monitoring sites if required to annualise monitoring data in future reporting years.
- Display annualisation calculations in the report should this be required for future reporting years.
- Submit Excel spreadsheet data document that is consistent with the report.

Allerdale Borough Council has taken forward a number of direct measures during the current reporting year of 2020 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 2.1.

Key completed measures are:

- Improvements to the Allerdale Borough Council Air Quality webpages referring to the Clean Air Hub and updates to the Environmental permitting webpages.
- Engagement with Public Health Professionals via the Air Quality and Public Health events focussed on reducing deaths and ill health attributed by poor air quality in Cumbria and Lancashire.
- Working with Port Authorities and updating webpages regarding ammonia emissions set out by the 2019 Clean Air Strategy. With air quality monitoring taking place close to the Port of Silloth and Port of Workington.
- Air Quality monitoring background sites established in Cockermouth and Maryport.
- Stall events and media communications within the borough regarding indoor air pollution and principle of reducing public exposure to air pollution in line with the 2019 Clean Air Strategy.

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

- Continue to work to educate and push the principles of reducing public exposure to air pollution, domestic burning ($PM_{2.5}$) indoor air quality in line with the 2019 Clean Air Strategy. This will include stall events, media communications and to explore opportunities within an educational setting.
- Allerdale Borough Council Environmental Health Department will continue to work with Planning Authorities and Developers with regard to new developments or national infrastructure projects focussing on air quality implications of such developments.
- Support communities and Town Councils to display air quality information in light of the 2019 Clean Air Strategy and any new air quality legislation.
- Assess agricultural developments via the planning process with regards to ammonia emissions.
- Allerdale Borough Council will continue to regulate and monitor combustion plant emission sources such as: Combined Heat Power Plants, Biomass Boilers and Diesel STOR Generator Plants via the planning process.
- Continue to explore bidding opportunities when eligible for widening the number of pollutants monitored and the resourcing of further air quality initiative activities and events.
- A Climate motion was agreed to make Allerdale Carbon Neutral by 2030 if possible. A cross-party Climate Change Task and Finish Group was set up with a series of recommendations issued. By March 2020 a portfolio holder has been appointed and

work has started to establish a Climate Change Group to update Allerdale Borough Council's Climate Change Strategy and Action Plan.

Allerdale Borough Council's priorities for the coming year are:

- Continue to act on the 2019 Clean Air Strategy and any changes to air quality legislation.
- Deliver a successful Clean Air Day 2020 now postponed to October 2020 working with County Council and businesses within the area. In order to encourage positive behavioural changes and lessons being learned, regarding collective action and the impact on air quality from the COVID-19 pandemic.
- Anti-idling awareness and domestic burning campaign. Sustainable transport and active travel messages to encourage positive behavioural change.
- Explore funding options to enable the extension of the number of pollutants monitored.
- Support air quality education within specific schools.
- Continue to work towards the agreed Climate Change Motion and the work that has started to establish a Climate Change Group to update the Climate Change Strategy and Action Plan.
- Allerdale Borough Council recognises the risks from air pollution on communities that face the greatest risks from the wider social and behavioural determinants of health (The Health Foundation, 2020). Allerdale Borough Council intends to continue to take a multi-agency approach with partners, working on community engagement projects to improve health outcomes.

The principal challenges and barriers to implementation that Allerdale Borough Council anticipates facing are:

- Funding issues regarding key national infrastructure projects some of which are now on hold.
- Allerdale Borough Council is a two-tier Borough Council with County Council, however we continue to work together to improve air quality within Allerdale.
- Maximising the effective use of resources available including Officer Time and funding.
- Funding to enable the extension of the number of pollutants monitored within the Allerdale region.

Households with no car/vans across Cumbria is at 21% in comparison to national average (Cumbria Observatory, 2011). This figure implies that there is a high percentage of car ownership. Bus and rail links are adequate although evening and Sunday services can be limited (Cumbria Community Foundation, 2019).

Progress on the following measures has been slower than expected due to:

- Working within rural communities to influence behaviour on domestic burning due to Officer Time and funding.

The table below shows progress on measures to improve air quality.

Measure number	Measure	EU category	EU classification	Date measure introduced	Organisations involved	Funding source	Key performance indicator	Reduction in pollutant / emission from measure	Progress to date	Estimated / actual completion date	Comments / Barriers to implementation
1	Review of air sampling points for NO2	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing	Allerdale Borough Council Environmental Health	Allerdale Borough Council	Evidence based variation in sampling points	N/A	Completed for 2019 ongoing for 2020	Ongoing continual review	
2	Allerdale Borough Council Environmental Health to work with Planning Authorities with regard to new development considering air quality implications	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Ongoing	Allerdale Borough Council	Allerdale Borough Council	Planning consultations made in accordance with consultation period	N/A	Environmental Health are consulted at pre-planning stage on all proposed developments which may impact on air quality. Via the planning process Allerdale has been pro-active in ensuring the borough maintains its low levels of pollution. Air quality assessments have been required for developments including potentially polluting industrial applications. Industrial applications, combined heat and power systems or other combustion method energy production such as gas turbine or biomass boilers	Ongoing	
3	Reducing levels of PM 2.5	Public Information	Via other mechanisms	2019	Allerdale Borough Council Environmental Health	Allerdale Borough Council	N/A	N/A	Implementation ongoing	Ongoing continual review	Targeting off grid areas using solid fuels and smoke control area
4	Reducing ammonia emissions from farming	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2019	Allerdale Borough Council and Natural England	Allerdale Borough Council and Natural England	Individual Merit. Number of Improvement applications granted	Ammonia and secondary PM 2.5 emissions	A number of enclosure applications have been received via the Allerdale Planning department due to the incentives offered by Natural England. Natural England are also consulted on any new applications to assist in incorporating best practice design and operation. Investigation of odour complaints will help identify poor practice of spreading. Close working with Environment Agency in relation to the spreading of sewage sludge and operation of Permitted Agricultural activities. With updates to Air Quality webpages to provide guidance	Ongoing	
5	National significant infrastructure projects	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2016	United Utilities	United Utilities	N/A	N/A	United Utilities launched their Good Neighbour campaign - Tree Fund with Cumbria Woodlands to improve environment and air quality. With a tree planting incentives event carried out in early 2020	2022	

6	Major Development	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2014	West Cumbria Mining Project	West Cumbria Mining Project	Previous Air Quality assessments undertaken on request of County Planning Authority. Assessments indicate that impact will be negligible on Allerdale area. Thought to be an increase of 6 freight train movements per day when in full operation	N/A	Ongoing with judicial review challenge recently withdrawn	Unknown	UK steel making for renewable sector. With commitments to develop carbon sink forest scheme
7	National significant infrastructure projects	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2015	Moorside Project	Moorside Project	N/A	N/A	On hold	Unknown	Funding issues regarding nuclear development
8	National significant infrastructure projects	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2018	West Cumbria Tidal Lagoon Project	West Cumbria Tidal Lagoon Project	N/A	N/A	On hold	Unknown	Funding issues regarding construction of lagoon projects
9	Allerdale Borough Council will continue with its statutory duty in connection to Part A2 and Part B Processes. Environment Agency are responsible for Part A1	Environmental Permits	Introduction / increase of environment charges through permit systems and economic instruments	Ongoing	Allerdale Borough Council and Environment Agency	Allerdale Borough Council	Risk based inspections in accordance with Statutory Guidance	N/A	Allerdale Borough Council regulated permits for 36 Part B and 3 A2 processes. No enforcement action was required during 2019 and no unexpected air pollution incidents have been recorded	Ongoing continual review	
10	Adopted Local Policy Section 19 - Renewable Energy and Low Carbon Technologies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2014	Allerdale Borough Council	Allerdale Borough Council	In order to achieve national renewable energy targets Allerdale Borough Council supports the development of new sources of renewable energy on the understanding measures taken avoid significant impacts on the local amenity	N/A	Ongoing	2029	Local Plan 1 sets plans for land in Allerdale outside of the Lake District National Park. Local Plan 2 is now awaiting approval from full Council
11	Adopted Local Policy Section 22 - Sustainable Travel Choices	Transport Planning and Infrastructure	Other	2014	Allerdale Borough Council	Allerdale Borough Council	Key objective of spatial planning is to ensure that jobs, housing, shopping, leisure and services are accessible by public transport, walking and cycling	N/A	Ongoing	2029	Local Plan 1 sets plans for land in Allerdale outside of the Lake District National Park. Local Plan 2 is now awaiting approval from full Council

12	Adopted Local Policy Section 21 - Developer Contribution	Policy Guidance and Development Control	Other policy	2014	Allerdale Borough Council	Allerdale Borough Council	Community Infrastructure Levy (CIL) is currently being explored as a levy that the Council may use to charge on new developments. This ensures that without compromising development viability. Contributions will provide necessary enhancements including energy initiatives and climate change solutions with regards to air quality	N/A	Ongoing	2029	Local Plan 1 sets plans for land in Allerdale outside of the Lake District National Park. Local Plan 2 is now awaiting approval from full Council
13	Adopted Local Policy Section 36 - Air, Water and Soil Quality	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2014	Allerdale Borough Council	Allerdale Borough Council	The policy sets out the council's approach to ensuring that air and water quality are protected and enhanced and soil quality is maintained and not eroded	N/A	Ongoing	2029	Local Plan 1 sets plans for land in Allerdale outside of the Lake District National Park. Local Plan 2 is now awaiting approval from full Council
14	Allerdale Travel Hierarchy	Promoting Travel Alternatives	Workplace Travel Planning	2018	Allerdale Borough Council	Allerdale Borough Council	Promotion of use of Allerdale's electric car. Reduction in private vehicle mileage and associated pollutant impacts of PM and NO2 etc	N/A	Ongoing	Ongoing continual review	
15	New Allerdale Environmental Waste Services Contract	Policy Guidance and Development Control	Sustainable Procurement Guidance	2019	Allerdale Borough Council and Tivoli	Allerdale Borough Council and Tivoli	N/A	PM10 and PM2.5	Two small pedestrian electrical sweepers are now in use and battery powered equipment is currently being trialled by Tivoli, the grounds maintenance provider. With the intention to continue to implement these changes within the following years to achieve their goal of using more battery powered handheld equipment. By completing this measure, it is it is anticipated that such attempts will significantly reduce air pollution and emissions	Ongoing continual review	
16	Cycle to work	Promoting Travel Alternatives	Promotion of cycling	2017	Allerdale Borough Council	Allerdale Borough Council	N/A	N/A	Implementation ongoing	Ongoing continual review	Active in-house travel plan. Tax free bike scheme to help employees save money on new bike and bike safety equipment
17	Statutory duty of investigation of dark smoke and smoke nuisance and managing smoke control zone. When necessary, enforcement action is taken	Public information	Other	Ongoing	Allerdale Borough Council	Allerdale Borough Council	Reductions in the number of offenders through engagement with results for 2019 compared to 2018 show similar figures	N/A	Ongoing	Ongoing	Awaiting legislative updates regarding new Environment Bill

18	Review of traffic restrictions in Allerdale area as part of the Cumbria Transport Plan Strategy 2011-2026	Traffic Management	Strategic highway improvements, re-prioritising road space away from cars, including Access management, Selective vehicle priority, bus priority, high vehicle occupancy lane	2011	Cumbria County Council	Cumbria County Council	N/A	N/A	Ongoing	2026	CCC are undertaking a review of the traffic restrictions in the towns of Workington, Aspatria, Wigton and Silloth after the financial year 2019/2020. This will likely only cover minor amendments to parking layouts and traffic movement. For Keswick, a transport study was undertaken in 2019 to develop plans for a larger transport strategy for the town. This is still ongoing however, with any possible changes to be reported on in due course
19	Air Quality Bids for funding	Policy Guidance and Development Control	Other policy	Ongoing	Allerdale Borough Council and DEFRA	Allerdale Borough Council and DEFRA	N/A	N/A	Ongoing	Unknown	
20	Promote and encourage the Home Working Policy	Promoting Travel Alternatives	Encourage / facilitate homeworking	Ongoing	Allerdale Borough Council	Allerdale Borough Council	Decreases in the amount of travel undertaken to main Offices where Council functions can be carried out remotely	N/A	Ongoing	Ongoing continual review	The COVID-19 Pandemic in 2020 has instigated a review into this measure
21	Highways England Works to A66/A595 Bridgefoot and Papcastle Roundabout	Traffic Management	Strategic highway improvements, Re-prioritising road space away from cars, including Access management, selective vehicle priority, bus priority, high vehicle occupancy lane	2019	Highways England	Highways England	N/A	N/A	Completed in 2020	2020	
22	Complete Solway Cycle Path part of the National Cycle Network (Hadrian's Cycleway)	Promoting Travel Alternatives	Promotion of cycling	2015	Allerdale Borough Council, Silloth-on-Solway Coastal Community Team and a combination of public, private and community partners	MHCLG's Coastal Communities Fund and DEFRA's Rural Development Programme for England	Promote active travel for healthy and active lifestyles	N/A	Hoped that construction works will begin in the late Summer of 2020	2020/2021	
23	Allerdale Borough Council - Visit Allerdale Tourism	Public Information	Via other mechanisms	2018	Allerdale Borough Council (Visit Allerdale)	Allerdale Borough Council	Public perception of issues associated with tourism and air quality	N/A	Ongoing continual review to webpages and promotion of air quality at events	Ongoing continual review	
24	Allerdale Borough Council Events Policy	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	2020	Allerdale Borough Council (Events Team)	Allerdale Borough Council	Promote and support events more sustainably	N/A	Ongoing	Ongoing	

25	Cold to Cosy Homes	Promoting Low Emission Plant	Other Policy	2019	Allerdale Borough Council Housing Authority and CAfS	Allerdale Borough Council and CAfS	Number of promotions	N/A	Ongoing	Ongoing	Although not set out as an initial air pollution intervention. The scheme provides energy saving and efficiency advice and support. In light of recent movements regarding climate change, indoor air quality and focuses on PM 2.5. The following information has therefore been included in this report as positive and relevant
26	Implementation of the Air Quality (Taxi and Private Hire Vehicles Database) Regulations 2019	Policy Guidance and Development Control	Other policy	2019	Allerdale Borough Council Licensing Authority and DEFRA	DEFRA	Number of reports made	N/A	Ongoing	Ongoing	To support the UK Plan for tackling roadside nitrogen dioxide concentrations and the development of Clean Air Zones
27	Penrith to Keswick Rail Link	Transport Planning and Infrastructure	Public transport Improvements interchanges stations and services	2020	Department of Transport	Department of Transport	N/A	N/A	Ongoing	N/A at the time reporting	Air Quality Bid by Cumbrian MPs to Department of Transport Ideas Fund to improve provision of public transport across Cumbria including areas in Allerdale
28	Promotion of local initiatives	Public Information	Other	2019	Allerdale Borough Council, Clean Air Day and partners	Allerdale Borough Council, Clean Air Day and partners	Number of promotions	N/A	Ongoing with preparations for Clean Air Day 2020 with Cumbria County Council	Ongoing	COVID-19 has postponed preparations for Clean Air Day 2020 to October 2020

PM2.5 – Local authority approach to reducing emissions and/or concentrations

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

Allerdale Borough Council recognises the impacts of $PM_{2.5}$ on the health and wellbeing of residents and environment. Public Health England have stated in their statistics that the annual concentration of fine particulate matter ($PM_{2.5}$) exposure to population in the Allerdale District is the lowest in the North West of England. With the average fine particulate matter ($PM_{2.5}$) exposure in Allerdale measured at 5 µg/m^3 compared to the

North West England average of 7.1 µg/m^3 and the England average of 8.9 µg/m^3 (PHOF, 2017).

In an attempt to address the Public Health Outcomes Framework results for Cumbria regarding exposure and associated implications of exposure from particulate matter (PHOF, 2017; PHOF, 2018). Allerdale Borough Council is taking the following measures to address $PM_{2.5}$:

- Allerdale Borough Council will continue with its duties to regulate and control in regards to emissions from all Part A2 and Part B Processes located within the Allerdale local authority area.
- Allerdale Borough Council will continue to work with developers with the planning and implementation of major developments which may impact air quality in Allerdale.
- Allerdale Borough Council will continue to monitor intensive farming practices within Allerdale working via the Environment Agency permitted links and the planning process.
- Allerdale Borough Council will consult with Natural England and Environmental Health via the Development Planning process to reduce emissions for new agricultural activities in the area.
- Allerdale Borough Council continues to regulate and enforce Smoke Control Areas and our duties under the Clean Air Act, please see Appendix D for a defined mapped areas.
- Allerdale Borough Council continue to regulate and monitor combustion emission sources such as Combined Heat Power Plants, Biomass boilers and Diesel STOR Generator Plants through the planning process.
- Educational information continues to be distributed via social media and promotional events across the region. In an attempt to change domestic burning behaviours and fuel used by those reliant solid fuels.
- Allerdale Borough Council considers its environmental impact of its council functions via establishing and reviewing its Travel Hierarchy, Home Working Policy, Electric Car Share Policy and environmental services contracts with Tivoli and Allerdale Waste Services.
- Allerdale Borough Council will act upon recommendations provided by the Climate Change Task and Finish Group regarding the Climate Change Motion. As well as continue with the work that has started to establish the Climate Change Group to update the Climate Change Strategy and Action Plan.

Air quality monitoring data and comparison with air quality objectives and national compliance

Summary of monitoring undertaken

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

Allerdale Borough Council undertook non- automatic (passive) monitoring of NO_2 at 12 sites during 2019. Table A.1 in Appendix A shows the details of the sites

Allerdale Borough Council demonstrated no exceedances from monitoring undertaken in previous monitoring years of 2018 and 2017. The 2019 annual monitoring results are well within the national objectives for Nitrogen Dioxide (NO_2). To date, there is no evidence that supports the declaration of an Air Quality Management Area. Figure A.1 – shows trends in Annual Mean NO2 Concentrations from 2015-2019.

The 2018 Annual Screening Report published a review of sampling locations to ensure monitoring is carried out in areas where concentrations are expected to be the highest and where the public (receptors) may be exposed to over the averaging period of the objectives.

Changes during the reporting year (2019) included:

Decommission of Railway Villa, Wigton

This monitoring location produced the lowest figures of all monitoring results in 2018. Allerdale Borough Council has the worst case approach to monitoring pollution levels and so this sampling point was removed.

Relocation of Crown Street, Cockermouth

The relocation of this monitoring location towards Gote Road Bridge onto a Cumbria County Council road sign in accordance with TG16. This action was taken due to a number of diffusion tubes becoming missing requiring annualisation of 2018 data.

New monitoring locations for 2019:

DT10 Station Street, Cockermouth

Working with County Council Highways Authorities it was agreed that this site was beneficial for investigation due to recent retail and housing developments. This monitoring site is positioned on a Cumbria county Council Lamppost at the junction towards the B5292 and A5086 may provide higher levels from queueing vehicles towards residential receptors when assessed in accordance with TG16.

DT12 Northside Primary School, Northside

Working with Northside Primary School this location was agreed due to its proximity to the A596. This location was selected due to a lack of monitoring in previous years as well as the close proximity of Workington Port and as an educational tool in line with the Clean Air Strategy 2019. In addition the potential of other industrial sources of NO_2 in the locality.

Planned changes for 2020 monitoring:

Strawberry How Road, Cockermouth

Strawberry How Road has been identified in relation to future increase road traffic associated with new planned developments and possible infrastructure developments. In addition, Strawberry How Road provides a suburban background monitoring location in line with TG16 and comments made regarding background monitoring locations in the previous submission.

Kirkby Street, Maryport

The introduction of an urban background monitoring location has been identified. This is in line with TG16 and comments made regarding background monitoring locations in the previous submission. It is felt the identification of this monitoring site is appropriate in

particular due to planned regeneration development of Maryport and satisfies Allerdale's approach to monitoring pollution levels.

Lawn Terrace, Silloth

The introduction of an industrial background monitoring location has been identified. This is in line with TG16 and comments made regarding background monitoring locations in the previous submission. It is felt that this residential and tourist area is where members of the public (receptors) might be regularly exposed to. In particular there is potential industrial sources of NO_2 and Silloth Port in accordance with the 2019 Clean Air Strategy.

Non-automatic monitoring sites

Allerdale Borough Council undertook non- automatic (passive) monitoring of NO_2 at 12 sites during 2019. Table A.1 in Appendix A shows the details of the sites.

Maps showing the location of the monitoring sites are provided in Appendix D. Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied (e.g. "annualisation" and/or distance correction), are included in Appendix C.

Individual pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias[4], "annualisation" (where the data capture falls below 75%), and distance correction[5]. Further details on adjustments are provided in Appendix C.

Nitrogen Dioxide (NO_2)

Table A.2 in Appendix A compares the ratified and adjusted monitored NO_2 annual mean concentrations for the past 5 years with the air quality objective of 40µg/m^3. Note that the concentration data presented in Table A.2 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 2019 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. Mapped air quality locations are presented in Appendix D.

In Table A.3 there are no exceedances of the lower annual objective for Nitrogen Dioxide of 40µg/m^3 at any of the 12 monitoring sites during 2019.As sites are situated for worst case scenario in close proximity to the pollutant source (road traffic), it is assumed that pollutant concentrations at the closest receptor would be lower.

From previous discussions with Local Air Quality Management helpdesk it has been advised that there is no need to demonstrate modelling of pollutant dispersal and distance correction to the nearest receptor. This is due to the results being well below the national objectives and outside of the threshold recommendations outlined by TG16 (annual mean above 36 µg/m^3). There are no annual means greater than 60µg/m3 (highest recorded 28.5 µg/m^3), demonstrating compliance with TG16 that an exceedance of the 1-hour mean 200 µg/m^3 objective is very unlikely to be reached at any of the air quality monitoring sites.

Individual site data:

DT1 Hall Park View, Workington

This monitoring point is located at a road improvement site for any future nuclear development. Diffusion tubes are placed at the possible worst case receptor on Hall Park View, Workington. 12 months of diffusion tube data was collected with 12 months being

[4] https://laqm.defra.gov.uk/bias-adjustment-factors/bias-adjustment.html

[5] Fall-off with distance correction criteria is provided in paragraph 7.77, LAQM.TG(16)

duplicate data, indicating good precision. For 2019, the data demonstrated an annual bias adjusted mean of 16.2μg/m^3 an increase of 0.2μg/m^3 from the previous reporting year.

DT2 Murray Road, Workington

This is an urban centre monitoring location on the façade of a building facing Murray Road close to the Workington Bus Station, a major bus station hub in Allerdale and the wider Cumbria community. Murray Road, is a High Street in Workington with a one way carriageway predominantly occupied by parking, loading and taxi ranks. 11 months of diffusion tubes were collected with 9 months being duplicate tube data, the annual bias adjusted mean recorded was 25μg/m^3**.** This figure of 25μg/m^3 is the third highest Nitrogen Dioxide annual mean concentration in Allerdale for 2019. However this data shows a reduction of 2.4μg/m^3 from 2018 and 3.5μg/m^3 in 2017, indicating a steady reduction of the Nitrogen Dioxide annual mean concentrations at this site.

DT3 Crown Street, Cockermouth

Due to historic limited data collection challenges a revised monitoring location at a similar local monitoring point facing the B5292 at Crown Street, Cockermouth was established. In line with TG16, this location has been repositioned on a Cumbria county Council Road sign closer to an alternative residential property and the mini roundabout towards Gote Road Bridge. 12 months of diffusion tube data were collected with 12 months being duplicate data, indicating good precision and an improvement in data collection. For 2019 the annual bias adjustment for this location was 19.8μg/m^3.

DT4 Main Street, Keswick

This roadside location in close proximity to a Guest House at the B5289-A5272 roundabout has been prone to substantial queueing to Lake District locations such as Derwent Water and towards the Borrowdale Valley. 12 months of diffusion tube data was collected with 10 months being duplicate tube data. The annual bias adjustment recorded a nitrogen dioxide annual mean concentration for this location was 25.5μg/m^3 and is the second highest Nitrogen Dioxide annual mean concentration in Allerdale for 2019.

DT5 Curzon Street, Maryport

This is a kerbside location situated to a busy four-way traffic light-controlled box junction and demonstrates worst case. 12 months of diffusion tube data was gained for this location including 12 months of duplicate data indicating good precision. The annual bias adjustment mean results in a nitrogen dioxide mean concentration of 23.9 μg/m^3 . In comparison to previous monitoring years, the data shows a reduction of 1.3μg/m^3 from 2018 and 2.3□g/m^3 in 2017, indicating a steady reduction of the Nitrogen Dioxide annual mean concentrations at this site.

DT6 Ramsay Brow, Workington

This is a kerbside location located at a receptor façade along the A66 in close proximity to the traffic lights controlled at the A596 junction. These are two major roads within West Cumbria and a bottleneck at Ramsay Brow is a common occurrence. 11 months of diffusion tube data was collected for this location with 9 months of duplicate data. This is the highest overall Nitrogen Dioxide annual mean concentration in Allerdale for 2019, however the annual bias adjustment of 28.5□g/m^3 which is a decrease of 3.5μg/m^3 to 2018's result of 32μg/m^3 .

DT7 King Street, Wigton

This is the longest monitoring location for Allerdale situated on a High Street in Wigton with now five years of data at this monitoring location. For 2019, 11 months of diffusion tube data was collected with 11 months of duplicate data. The data for 2019 calculated an annual bias adjusted mean of 23.7μg/m^3 and is an increase of 0.3μg/m^3 from 2018 and 0.6μg/m^3 increase from 2017 monitoring data

DT8 Main Road, Harrington

This is a kerbside location at a receptor façade along the A597 and is the most southerly air quality monitoring points within Allerdale at the moment. Traffic information provided by Cumbria County Council indicates a 7-day average of 11163 vehicle movements per day from monitoring in 2018. 12 months of diffusion tube data was collected with 12 months of duplicate data, indicating good precision. The data for 2019 demonstrated an annual bias adjustment mean of 16.2$\mu g/m^3$ a reduction of 0.6$\mu g/m^3$ compared to the monitoring results in 2018.

DT9 Lawson Street, Aspatria

This kerbside location at a receptor façade along the A596 was selected due to community requests regarding an increase in HGV activity. Traffic information provided by Cumbria County Council indicates a 7-day average of 5570 vehicle movements per day from monitoring in 2017.12 months of diffusion tube data was collected with 12 months of duplicate data, indicating good precision. For 2019 the annual adjusted mean recorded was 16 g/m^3 a reduction of 0.7$\mu g/m^3$, and is one of the lowest Nitrogen Dioxide annual mean concentrations in Allerdale for 2019.

DT10 Station Street, Cockermouth

This kerbside location at Station Street next to South Street is in close proximity to residential and commercial properties. This location was selected as the junction towards the B5292 and A5086 may provide higher levels from queueing vehicles towards residential receptors when assessed with TG16. 12 months of diffusion tube data was collected with 12 months of duplicate data, indicating good precision. The annual bias adjustment recorded a nitrogen dioxide annual mean concentration of 16.5$\mu g/m^3$ for this location. This is the first 12 months of monitoring that has been completed for this location since its introduction in 2019.

DT11 Penrith Road, Keswick

This monitoring location is situated close to a Guest House along a main A591 and A5271 junction. 12 months of diffusion tube data was collected with 10 months of duplicate data. Traffic information provided by Cumbria County Council indicates a 7-day average of 6546 vehicle movements per day from monitoring in 2018. The data for 2019 demonstrated an annual bias adjustment mean of 20.2$\mu g/m^3$. This is the first 12 months of monitoring that has been completed for this location since its introduction in 2018.

DT12 Northside Primary School, Northside

This is a new monitoring location for 2019 and is situated at the façade of Northside Primary School in accordance with TG16. In addition this location is along the A596 and is in close proximity to Workington Port and a retail park. 11 months of diffusion tube data was collected with 11 months of duplicate data. The calculated an annual bias adjusted mean for 2019 was 12.2$\mu g/m^3$ and is the lowest Nitrogen Dioxide annual mean concentration in Allerdale for 2019.

Appendix A: Monitoring results

Table A.1 – Details of non-automatic monitoring sites

Site ID	Site Name	Site Type	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) (1)	Distance to kerb of nearest road (m) (2)	Tube collocated with a Continuous Analyser?	Height (m)
DT1	Hall Park View, Workington	Kerbside	300721	528958	NO_2	NO	0	1	NO	2.5
DT2	Murray Road, Workington	Urban Centre	301194	528711	NO_2	NO	N/A	1	NO	2.5
DT3	Crown Street, Cockermouth	Kerbside	311652	530658	NO_2	NO	0	0.5	NO	2.5
DT4	Main Street, Keswick	Roadside	326419	523602	NO_2	NO	4	1.5	NO	2.5
DT5	Curzon Street, Maryport	Kerbside	303778	536534	NO_2	NO	5	1	NO	2.5
DT6	Ramsay Brow, Workington	Kerbside	300588	528682	NO_2	NO	0	1	NO	2.5
DT7	King Street, Wigton	Kerbside	325508	548419	NO_2	NO	2	1	NO	2.5
DT8	Main Road, High Harrington	Roadside	299591	525545	NO_2	NO	0	2	NO	2.5
DT9	Lawson Street, Aspatria	Kerbside	315299	542145	NO_2	NO	0	1	NO	2.5
DT10	South Street, Cockermouth	Kerbside	312091	530547	NO_2	NO	8.7	0.5	NO	2.5
DT11	Penrith Road, Keswick	Kerbside	327949	523764	NO_2	NO	7	1	NO	2.5
DT12	Northside Primary School, Northside	Kerbside	299939	529709	NO_2	NO	8	0	NO	2.5

Notes:

1. 0m if the monitoring site is at a location of exposure (e.g. installed on the façade of a residential property).
2. N/A if not applicable

Table A.2 – Annual mean NO_2 monitoring results

The numbers for the years 2015 top 2019 are the NO2 annual mean concentration (µg/m^3) [3] [4]

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) (1)	Valid Data Capture 2019 (%) (2)	2015	2016	2017	2018	2019
DT1	300721	528958	Kerbside	Diffusion Tube	100	100				16	16.2
DT2	301194	528711	Urban Centre	Diffusion Tube	75	92			28.5	27.4	25
DT3	311652	530658	Kerbside	Diffusion Tube	95	95					19.8
DT4	326419	530658	Roadside	Diffusion Tube	96	100		29	29.3	26	25.5
DT5	303778	536534	Kerbside	Diffusion Tube	100	100		26	26.2	25.2	23.9
DT6	300588	528682	Kerbside	Diffusion Tube	87	92			30	32	28.5
DT7	325508	548419	Kerbside	Diffusion Tube	92	92	26	25.2	23.1	23.4	23.7
DT8	299591	525545	Roadside	Diffusion Tube	100	100				16.8	16.2
DT9	315299	542145	Kerbside	Diffusion Tube	100	100				16.7	16
DT10	312091	530547	Kerbside	Diffusion Tube	95	95					16.5
DT11	327949	523764	Kerbside	Diffusion Tube	92	100				21.7	20.2
DT12	299939	529709	Kerbside	Diffusion Tube	92	92					12.2

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

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

Notes:

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

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

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

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

Figure A.1 – Trends in annual mean NO_2 concentrations

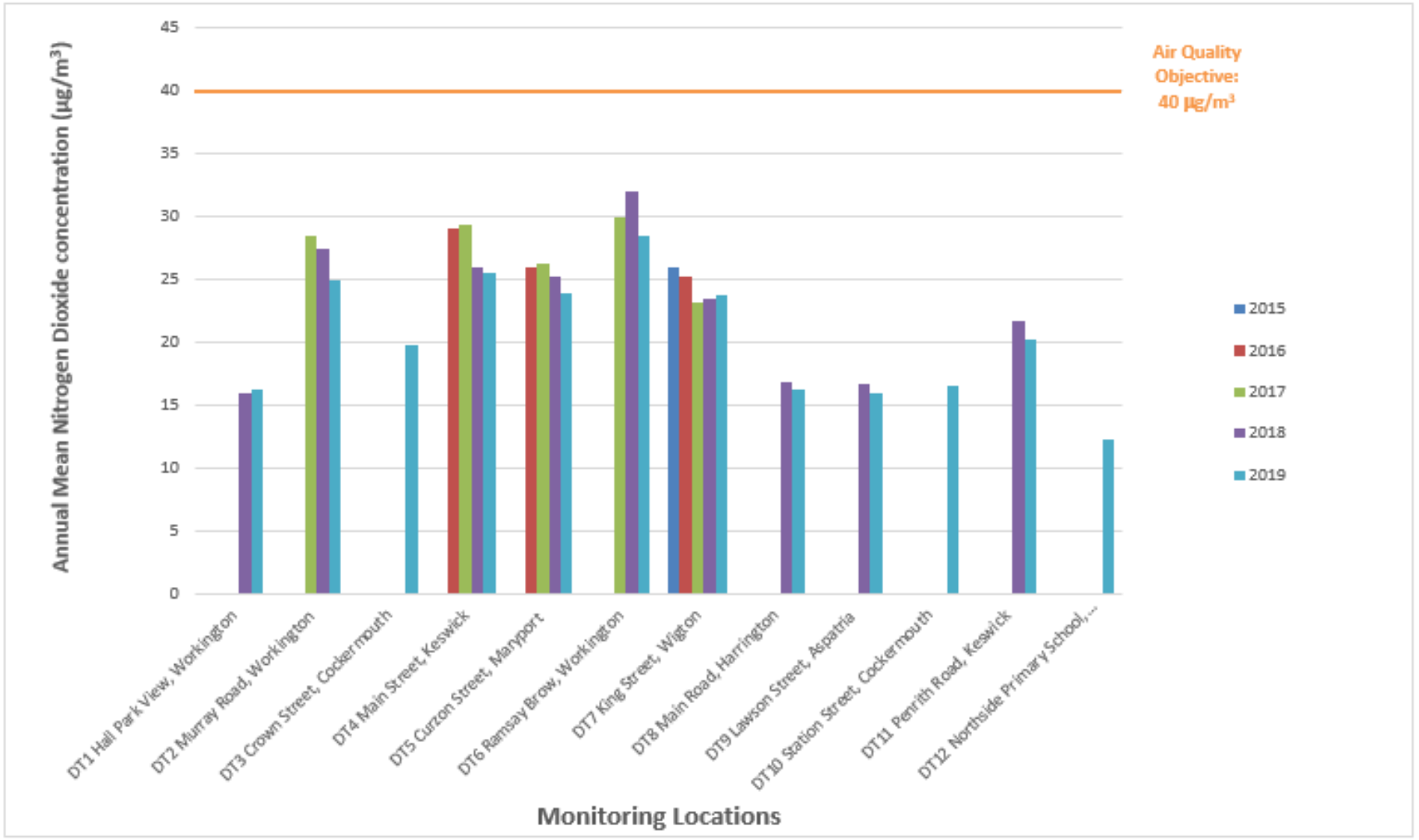
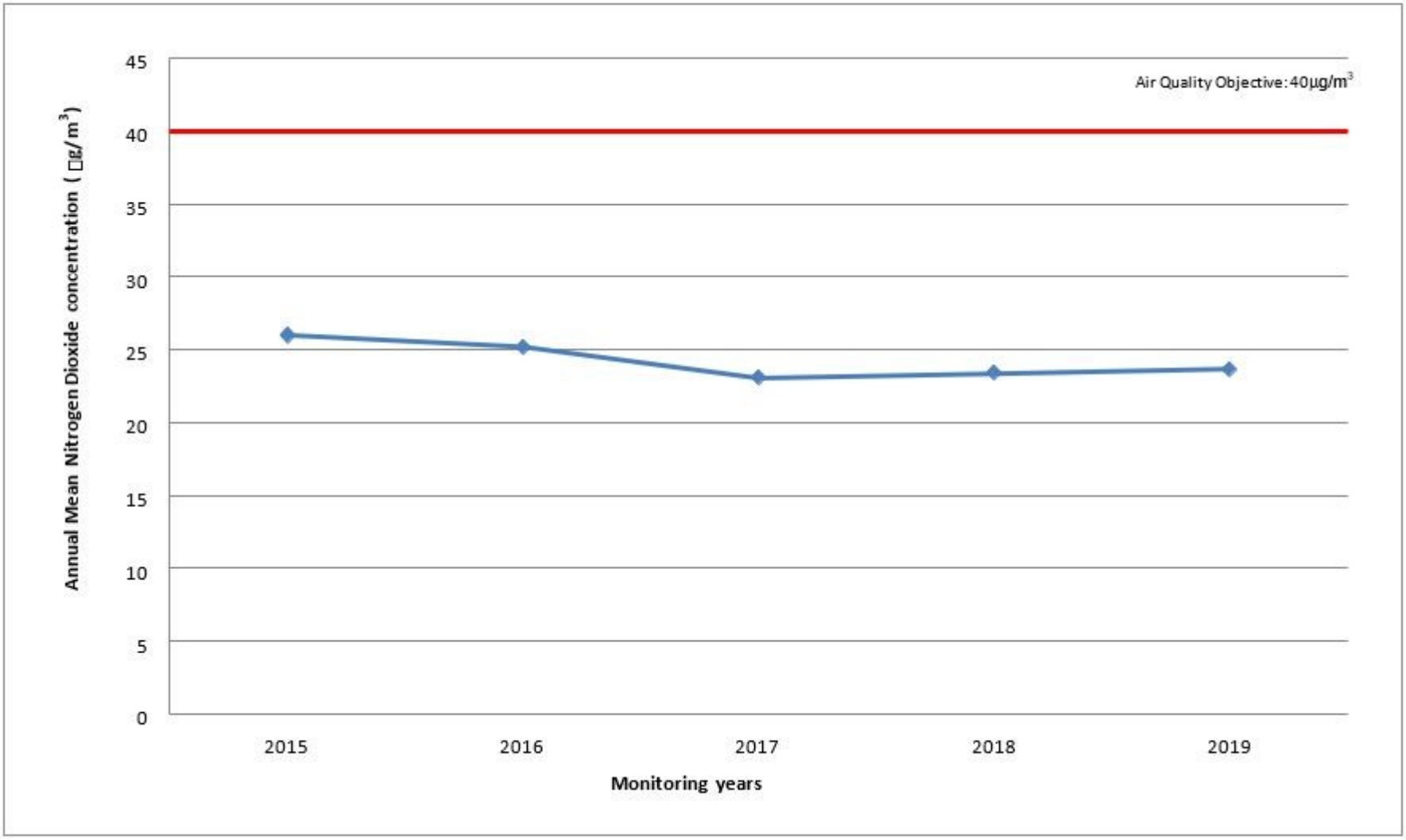


Figure A.2 – Trend in the annual mean concentration of NO_2 at DT7 King Street, Wigton



Appendix B: Full monthly diffusion tube results for 2019

Table B.1 - NO_2 monthly diffusion tube results – 2019

June to December are NO_2 mean concentrations ($\mu g/m^3$). The bias adjusted and distance corrected columns are the annual mean numbers.

Site ID	X OS Grid Ref (Easting)	Y OS Grid Ref (Northing)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.75) and Annualised (1)	Distance Corrected to Nearest Exposure (2)
DT1	300721	528958	26.7	21.2	18.1	24.3	17.8	16.3	16.1	12	18.2	34.4	32.3	21.9	21.6	16.2	-
DT2	301194	528711	42	33.7		32	37.6	34	35	33	38	34	44	36	33.3	25	-
DT3	311652	530658	38	28	26	28	25	18	19	18	24	28	37	28	26.4	19.8	-
DT4	326419	523602	40	32	35	33	34	29	34	36	35	32	35	31.7	34	25.5	N/A
DT5	303778	536534	39	35	35	27	30	25	28	28	32	30	37	36	31.8	23.9	N/A
DT6	300588	528682	45.5		40.2	41.8	35.6	31.7	33.5	33.6	32.4	41.3	44.3	38.3	38	28.5	-
DT7	325508	548419	40	30	30	33	29	27	29	22	30	34	44		31.6	23.7	N/A
DT8	299591	525545	28	19	12	32	21	20	15	10	20	27	38	17	21.6	16.2	-
DT9	315299	542145	28	21	23	20	20	18	18	16	18	21	30	22	21.3	16	-
DT10	312089	530547	29	22	19	25	20	18	18	15	19	23	32	24	22	16.5	-
DT11	327949	327949	30	43	27	32	27	24	25	23	25	30	32	21	26.9	20.2	N/A
DT12	299399	529709		22	16	15	16	12	15	14	16	15	18	19	16.2	12.2	-

☐ **Local bias adjustment factor used**

☒ **National bias adjustment factor used**

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

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

Notes:

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

NO_2 annual means exceeding 60µg/m^3, indicating a potential exceedance of the NO_2 1-hour mean objective are shown in **bold and underlined.**

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

(2) Distance corrected to nearest relevant public exposure.

Appendix C: Supporting technical information / air quality monitoring data QA/QC

Nitrogen Dioxide (NO2) diffusion tube QA/QC

Diffusion tubes may systematically under or over-read Nitrogen Dioxide (NO2) concentrations when compared to a chemiluminescence analyser. This is known as 'bias' and can be corrected to improve the accuracy of results using a suitable bias adjustment factor. This bias adjustment factor can be determined from a local study that has co-located diffusion tubes with a chemiluminescence analyser. The DEFRA Local Air Quality Management (LAQM) Helpdesk has collected a database of bias adjustment factors determined from Local Authority co-location studies across the United Kingdom (U.K.). Using an orthogonal recession combined with bias adjustment factors have been calculated for each analysing laboratory, year and preparation method combination for which data is available.

Diffusion tube national adjustment factor

The diffusion tubes for 2019 were supplied and analysed by Socotec UK, Didcot and the preparation method used was 50% TEA in acetone. The national adjustment factor for SOCOTEC Didcot, 50% TEA in acetone, is 0.75 based on 24 studies (Spreadsheet Version Number: 03/20).

As there are no co-location studies available the national Nitrogen Dioxide bias adjustment factor was used as described above.

National Diffusion Tube Bias Adjustment Factor Spreadsheet — Spreadsheet Version Number: 03/20

Follow the steps below in the correct order to show the results of relevant co-location studies

Data only apply to tubes exposed monthly and are not suitable for correcting individual short-term monitoring periods

Whenever presenting adjusted data, you should state the adjustment factor used and the version of the spreadsheet

This spreadhseet will be updated every few months: the factors may therefore be subject to change. This should not discourage their immediate use.

This spreadsheet will be updated at the end of June 2020

LAQM Helpdesk Website

The LAQM Helpdesk is operated on behalf of Defra and the Devolved Administrations by Bureau Veritas, in conjunction with contract partners AECOM and the National Physical Laboratory.

Spreadsheet maintained by the National Physical Laboratory. Original compiled by Air Quality Consultants Ltd.

Step 1:	Step 2:	Step 3:	Step 4:								
Select the Laboratory that Analyses Your Tubes from the Drop-Down List	Select a Preparation Method from the Drop-Down List	Select a Year from the Drop-Down List	Where there is only one study for a chosen combination, you should use the adjustment factor shown with caution. Where there is more than one study, use the overall factor[3] shown in blue at the foot of the final column.								
If a laboratory is not shown, we have no data for this laboratory.	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]	If you have your own co-location study then see footnote[4]. If uncertain what to do then contact the Local Air Quality Management Helpdesk at LAQMHelpdesk@uk.bureauveritas.com or 0800 0327953								
Analysed By[1]	Method (To undo your selection, choose (All) from the pop-up list)	Year[2] (To undo your selection, choose (All))	Site Type	Local Authority	Length of Study (months)	Diffusion Tube Mean Conc. (Dm) (µg/m³)	Automatic Monitor Mean Conc. (Cm) (µg/m³)	Bias (B)	Tube Precision[5]	Bias Adjustment Factor (A) (Cm/Dm)	
Socotec Didcot	50% TEA in acetone	2019	R	Wavertree Borough Council	12	33	24	44.7%	G	0.69	
SOCOTEC Didcot	50% TEA in acetone	2019		Overall Factor[3] (24 studies)				Use		0.75	

Image: National Diffusion Tube Bias Adjustment Factor Spreadsheet

QA/QC of diffusion tube monitoring

SOCOTEC is the laboratory that supplies and analyses the diffusion tubes collected by Allerdale Borough Council. SOCOTEC holds the highest ranking of 'satisfactory' laboratory. DEFRA information indicates the laboratory precision as good for all 2019 data. The Nitrogen Dioxide tubes are prepared by spiking acetone: triethanolamine (50:50) onto grids prior to the tubes being assembled. They are desorbed with distilled water and the extract analysed using a segmented flow autoanalyser with ultraviolet (UV) detection. The results are initially calculated assuming an ambient temperature of 11□C and are adjusted to 20□C to allow for direct comparison with the air quality objectives.

Precision and accuracy

Allerdale Borough Council monitoring sites have two tubes located and are referred to as duplicates. Tube precision is separated into 2 categories: good or poor. Tubes are considered to have good precision when the coefficient of variation (CV) is less than 20% and the average CV of all monitoring periods is less than 10%. Tubes are considered to have poor precision where the CV of 4 or more periods are greater than 20% and/or the average CV is greater than 10%. All of 12 the diffusion tube study periods had a CV of below 20%

(good precision). These calculations are undertaken in accordance with the DEFRA Precision and Accuracy Check Tool.

Data Capture

Single tubes were on occasion missing from the duplicate monitoring sites, please see Table B.2., below for further detail.

Table B.2: Data capture and further monitoring detail for diffusion tube sites

Site	Number of months of data collected	Annualisation Required (Less than 75% data capture)	Months of duplicate data	Precision Poor/Good
DT1	12	No	12	Good
DT2	11	No	9	Good
DT3	12	No	12	Good
DT4	12	No	10	Good
DT5	12	No	12	Good
DT6	11	No	9	Good
DT7	11	No	11	Good
DT8	12	No	12	Good
DT9	12	No	12	Good
DT10	12	No	12	Good
DT11	12	No	10	Good
DT12	11	No	11	Good

Annualisation

Data capture across the 12 sites was not less than 75% of the 12-month monitoring period; therefore in line with TG16, annualisation of the data was not required at any of the 12 sites for 2019.

Distance Correction

Monitoring sites are located for the worst case scenario in close proximity to pollutant sources of concern (road traffic), it is therefore assumed that pollutant concentrations at the closest possible receptor would be lower. From previous discussion with Local Air Quality Management (LAQM) Helpdesk it was advised that there is no need to demonstrate the modelling of pollutant dispersal and distance correction to the nearest receptors. This is because monitoring results are well below the national objectives and outside of the threshold recommendations outlined within TG16 (Annual mean above 36 µg/m^3).

Diffusion Tube Exposure Method

Diffusion tubes are installed and changed monthly in accordance with the DEFRA's Diffusion Tube Monitoring Calendar. Allerdale Borough Council store and handle diffusion tubes in accordance with RIAMS: Nitrogen Dioxide Diffusion Tube Monitoring TG16 and PG16.

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Appendix D: Map(s) of monitoring locations and AQMAs

Figure B.1: 2019 diffusion tube monitoring locations across Allerdale

Figure B.2: DT1 Hall Park View, Workington

Figure B.3: DT2 Murray Road, Workington

Figure B.4: DT3 Crown Street, Cockermouth

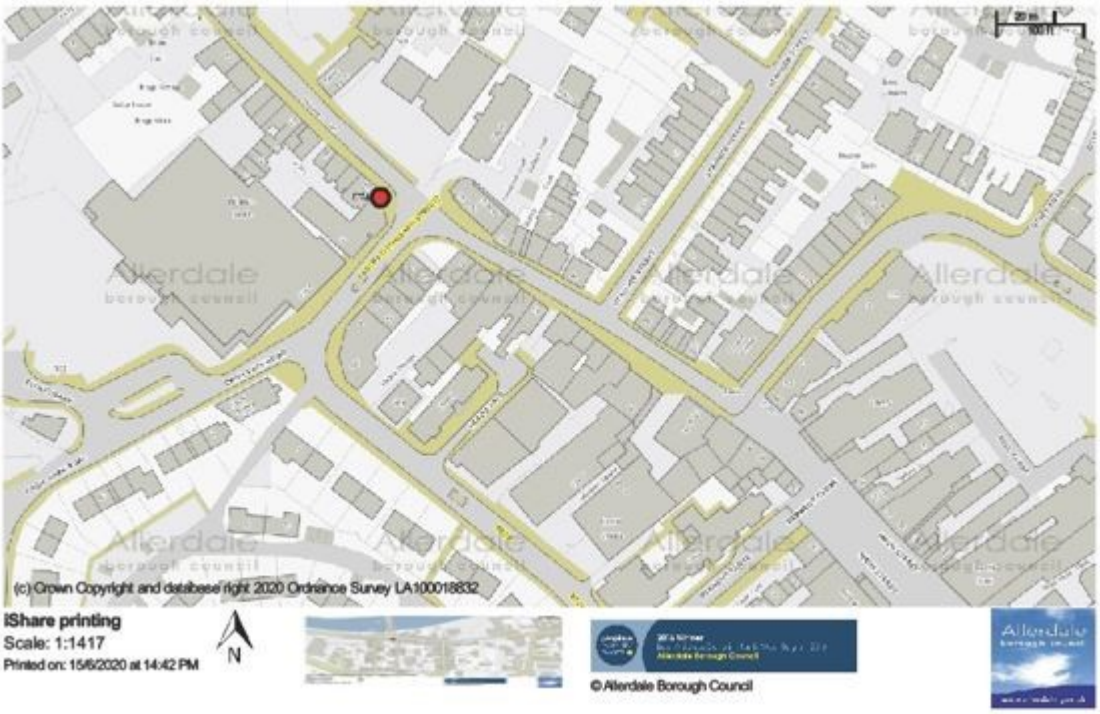

Figure B.5: DT4 Main Street, Keswick

Figure B.6: DT5 Curzon Street, Maryport

Figure B.7: DT6 Ramsay Brow, Workington

Figure B.8: DT7 King Street, Wigton

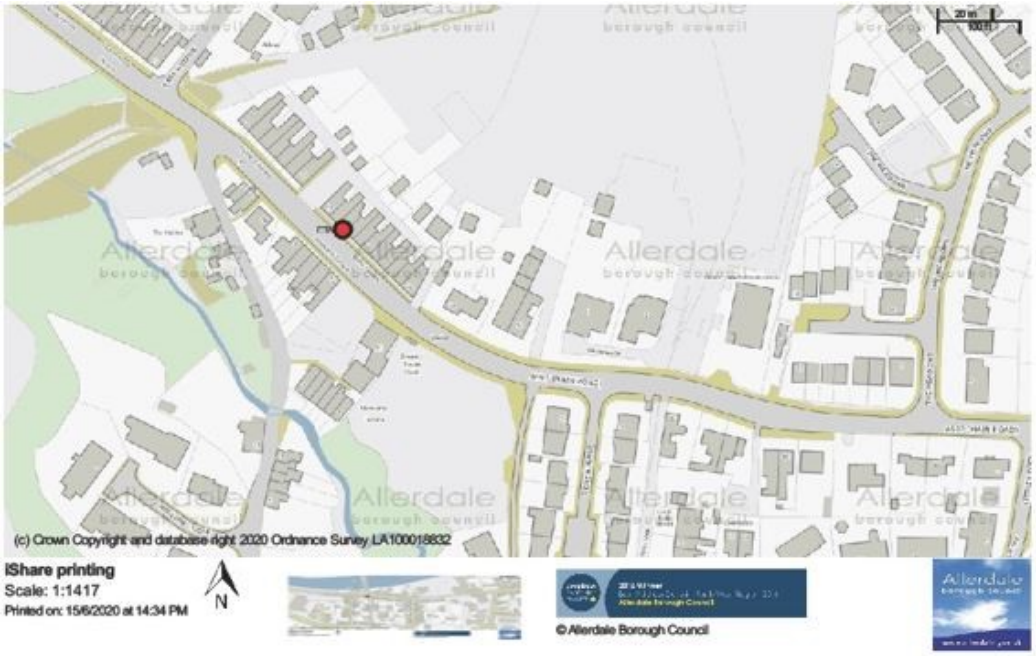

Figure B.9: DT8 Main Road, High Harrington

Figure B.10: DT9 Lawson Street, Aspatria

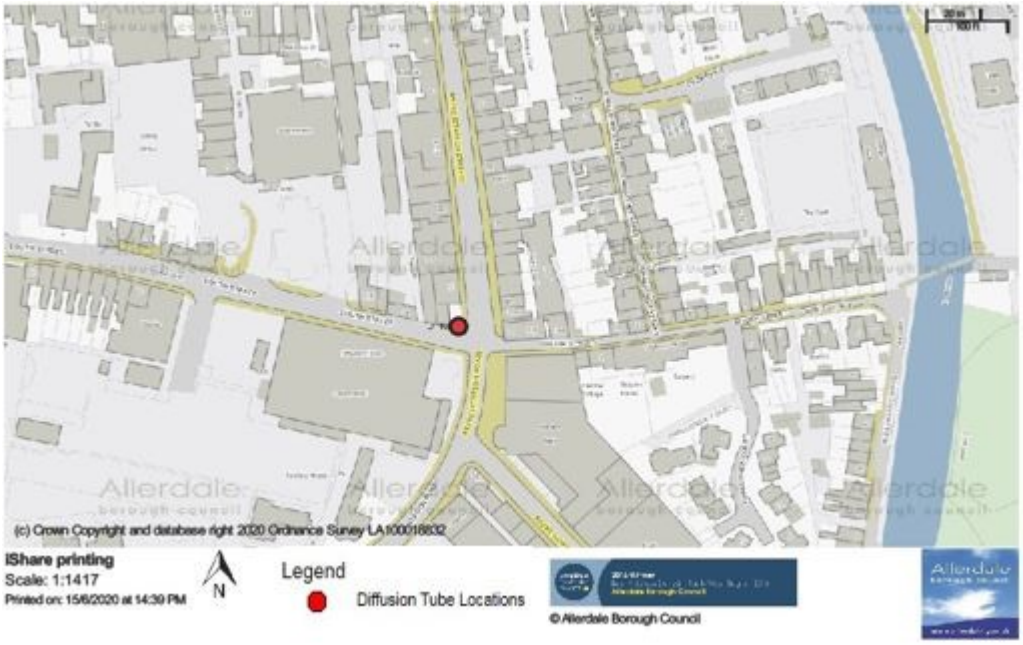

Figure B.11: DT10 Station Street, Cockermouth

Figure B.12: DT11 Penrith Road, Keswick

Figure B.13: DT12 Northside Primary School, Northside

Figure B.14: Smoke Control Area within the red boundary in relation to nearby diffusion tube monitoring sites

Appendix E: Summary of air quality objectives in England

Table E.1 – Air Quality Objectives[6] in England

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

[6] 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	Air quality Annual Status Report
DEFRA	Department for Environment, Food and Rural Affairs
DT	Diffusion Tube Monitoring Location
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
PG16	Local Air Quality Management Policy Guidance 16
PHOF	Public Health Outcomes Framework
PM_{10}	Airborne particulate matter with an aerodynamic diameter of 10µm (micrometres or microns) or less
$PM_{2.5}$	Airborne particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO_2	Sulphur Dioxide
TG16	Local Air Quality Management Technical Guidance 16
U.K.	United Kingdom

References

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