



2019 Air Quality Annual Status Report (ASR)

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

June 2019

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1 Executive Summary: Air Quality in Our Area

1.1 Air Quality in Calderdale

Air pollution is associated with a number of adverse health impacts. It is recognised as a contributing factor in the onset of heart disease and cancer. Additionally, air pollution particularly affects the most vulnerable in society: children and older people, and those with heart and lung conditions. There is also often a strong correlation with equalities issues, because areas with poor air quality are also often the less affluent areas^{1,2}.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion³.

Calderdale generally benefits from good air quality, with large rural areas, but there are locations, particularly associated with busy major roads, where pollution levels are of concern. Calderdale currently has seven Air Quality Management Areas, all declared because the annual average concentration of nitrogen dioxide is being, or is likely to be, exceeded. The areas, and the dates of declaration and amendment, are shown below. Further information can be found on the website

<https://calderdale.gov.uk/v2/businesses/pollution/air-quality/air-quality-management-areas-aqma>. The complete list of AQMAs in England can be found at <http://uk-air.defra.gov.uk/aqma/list>

Designation	Location	Declared	Amended
Calderdale No.1	Halifax A629	October 2005	April 2014
Calderdale No.2	Sowerby Bridge A58	July 2006	
Calderdale No.3	Hebden Bridge A646	August 2006	
Calderdale No.4	Luddendenfoot A646	July 2007	March 2014
Calderdale No.5	Stump Cross A58	July 2007	March 2014
Calderdale No.6	Brighouse centre	July 2007	
Calderdale No.7	Hipperholme A58	April 2014	

The nitrogen dioxide monitoring results for 2018 are similar overall to those for 2017, with no real evidence of improvement in many areas. One exception is Hebden Bridge town centre, where the lower concentration of nitrogen dioxide may be related to changes in through traffic due to major long term roadworks at Mytholmroyd, a mile to the west on the A646.

The Council has also undertaken air quality monitoring in Mytholmroyd centre following concerns raised by local residents and businesses about the impact on air quality of the long term flood alleviation works. These works have required traffic controls on the A646 and queues through the village centre. The Council is working with the contractor to minimise the impacts, having now identified two locations where the annual mean objective for nitrogen dioxide is being exceeded.

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

The 2018 results for Huddersfield Rd Halifax are incomplete as the monitoring station was shut down for several months in connection major roadworks on the A629. When the monitor was turned back on the roadworks continued and the monitoring results are unlikely to be representative of the typical road traffic contribution. The results are reported for completeness.

Sowerby Bridge was also affected by roadworks in the summer of 2018. The annual mean concentrations of nitrogen dioxide and PM₁₀ at this site show no decline in 2018.

1.2 Actions to Improve Air Quality

The Council's Air Quality Action Plan (AQAP) has been developed and is in the process of being reviewed by the Council. Its adoption has been delayed, but the Council is making improvements to air quality through several initiatives identified in the AQAP.

1.2.1 West Yorkshire Plus Transport Scheme A629 Phase 1a corridor scheme

This phase of the scheme has been completed. Key elements are

- Improved highway corridor congestion management via road widening / signal upgrade
- New Bus /cycling / walking infrastructure
- UK's largest living green wall structure adjacent a public highway.

Calderdale AQMA No.1 Salterhebble follows this section of the A629 and the scheme may have benefits in terms of reducing congestion and nitrogen dioxide concentrations along the route. It should be possible to identify improvements from 2019 monitoring data (the scheme was opened in 2018 but monitoring data for that year is incomplete, as noted above).

1.2.2 ULEV Taxi Scheme

The Authority is part of a West Yorkshire Combined Authority (WYCA)- led project to install Electric Vehicle rapid chargers to encourage Taxi Drivers to adopt Ultra Low Emission Vehicles. A supplier has now been appointed through a procurement process and the programme has started in earnest. Calderdale are programmed to receive 8 of these charging points by April 2020.

1.2.3 On-Street Residential EV Charging Scheme

The Authority is aiming to apply for some Office for Low Emission Vehicles (OLEV) funding to install some electric vehicle charging points in areas where residents don't have access to off-street charging. If successful the Authority will install up to 10 chargers by April 2020.

1.2.4 Bus emissions

The Council has worked with local bus operators, and in particular First Bus, to upgrade the local bus fleet. This work is continuing and a number of buses have

been retrofitted to meet improved emission standards. Further details are in the body of the report.

1.3 Conclusions and Priorities

As discussed in the body of this report exceedances of the annual mean objective for nitrogen dioxide have been identified outside AQMAs. This has largely been the result of extended monitoring in response to local concerns, and in particular approaches from residents and businesses affected by the flood defence works at Mytholmroyd.

There has been evidence of a continuing long-term downward trend in annual mean nitrogen dioxide concentrations within AQMAs, but each area continues to be affected by concentrations above the annual mean objective at some of the monitored sites.

The Council's priorities for the coming years include progress with projects such as the A629 Phase 1b upgrade, commencing construction early 2020 and designed to further extract maximum efficiency from this major travel corridor. Other major schemes around Halifax town centre will deliver greater transport choices for residents and visitors as well as re-routing traffic away from the centre of town. Brighouse will benefit from road corridor improvements in the coming years, and Elland's rail station will offer greater choice for travel across the County. There are many challenges, including obtaining planning approval, acquisition of land and assets, value engineering and establishing market interest in bidding for contracts.

In strategic terms the Council envisages that implementation of the Transport Strategy, Low Emissions Strategy and Local Plan will play a key role in tackling air quality issues. These elements therefore underpin many of the key priorities identified below.

- Priority 1 - promoting alternatives to private vehicle use, recognising the contribution of diesel vehicles and bidding for ULEV funding whenever possible
- Priority 2 – improving the transport network infrastructure, as set out in the Council's Transport Strategy and Local Plan
- Priority 3 –developing awareness of impacts and remedies, and integrating the priorities of other strategies and frameworks, such as public health (active travel), sustainability (carbon reduction strategy) and local planning (sustainable development)
- Priority 4 - encouraging public engagement and interest through improved communication and community involvement.

1.4 Local Engagement and How to get involved

The Council has undertaken consultation on its Air Quality Action Plan, Low Emissions Strategy and on the declaration of a new AQMA on the A58 at New Bank, Halifax.

Platforms have included social media, direct postal contact and the “Engage” online consultation portal.

The Council has worked with a local school to investigate and improve understanding of air quality and has entered into a project with one school to investigate the effectiveness of green screens. This is described later in this report.

The Council is planning further improvements to its air quality web pages, and is continuing to work towards publication of ‘live’ data from its continuous monitoring stations having overcome a number of technical challenges. There was a consultation in 2018 on the Low Emission Strategy and the Air Quality Action Plan, and the Council welcomes interest from the community on air quality matters.

An information campaign is being planned, to be launched on Clean Air Day but carrying a clear branded message for the longer term.

The Council is investigating the possibility of declaring an air quality targeted action area which will involve much closer engagement and consultation with local people and businesses. The resources for such a step have yet to be secured.

Air quality is a key consideration for the Local Plan, and the Council’s adoption of the West Yorkshire Low Emissions Strategy has been an important development in planning terms, with many planning applications including air quality assessments and proposals for mitigation measures.

The Council anticipates that its own actions will complement the UK Government’s measures to tackle poor air quality, as set out in the Clean Air Strategy document [DE19B].

Further information about local air quality is available on the Council’s web pages. An appendix has been included in this report outlining how to obtain the Council’s air quality monitoring data. Previous reports such as the 2018 Annual Status Report [ASR18] are also available on the website.

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2 Local Air Quality Management

This report provides an overview of air quality in Calderdale during 2018. It fulfils the requirements of Local Air Quality Management (LAQM) as set out in Part IV of the Environment Act (1995) and the relevant Policy and Technical Guidance documents.

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

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

3 Actions to Improve Air Quality

3.1 Air Quality Management Areas

Air Quality Management Areas (AQMAs) are declared when there is an exceedance or likely exceedance of an air quality objective. After declaration, the authority must prepare an Air Quality Action Plan (AQAP) within 12-18 months setting out measures it intends to put in place in pursuit of compliance with the objectives.

A summary of AQMAs declared by Calderdale can be found in Table 3-A. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online at https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=43 . Alternatively, see Appendix D: Map(s) of Monitoring Locations and AQMAs, which provides a map of air quality monitoring locations in relation to the AQMA(s).

The Council has consulted on its intention to declare a new AQMA on the A58 at New Bank, Halifax. For more details see the monitoring section.

Table 3-A – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)				Action Plan		
						At Declaration		Now		Name	Date of Publication	Link
Calderdale No.1 Salterhebble	Declared October 2005, amended April 2014	NO2 Annual Mean	Halifax	Stretch of the A629 south of Dryclough Lane	YES	46	µg/m3	52	µg/m3	AQAP 2009	2009 & 2018	See text
Calderdale No.2 Sowerby Bridge	Declared July 2006	NO2 Annual Mean	Sowerby Bridge	A58 through central Sowerby Bridge	YES	53	µg/m3	45	µg/m3	AQAP 2009	2009 & 2018	See text

Calderdale MBC

Calderdale No.3 Hebden Bridge	Decalred August 2006	NO2 Annual Mean	Hebden Bridge	A646 through town centre	YES	48 µg/m3	µg/m3	46	µg/m3	AQAP 2009	2009 & 2018	See text
Calderdale No.4 Luddendenfoot	Declared July 2007, amended March 2014	NO2 Annual Mean	Luddendenfoot	A646 through town centre	YES	50	µg/m3	41	µg/m3	AQAP 2017	2018	See text
Calderdale No.5 Stump Cross	Declared July 2007	NO2 Annual Mean	Halifax	A58 at junction of Leeds Road and Bradford Road	YES	58	µg/m3	39 (42)	µg/m3	AQAP 2017	2018	See text

Calderdale MBC

Calderdale No.6 Brighouse	Declared July 2007, amended March 2014	NO2 Annual Mean	Brighouse	Encircling town centre	YES	51	µg/m3	49	µg/m3	AQAP 2017	2018	See text
Calderdale No.7 Hipperholme	Declared March 2014	NO2 Annual Mean	Hipperholme	A58 Leeds Road close to junction with Brighouse Road	YES	47	µg/m3	48	µg/m3	AQAP 2017	2018	See text

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

Note that different monitoring locations may have been used at declaration and in 2018, so caution should be exercised in making any comparisons.

3.2 Progress and Impact of Measures to address Air Quality in Calderdale

Defra's appraisal of last year's ASR concluded that the evidence provided by the Council supported the conclusions reached for all sources and pollutants. Specific points raised are highlighted below.

We note the details provided in relation to Transport Infrastructure measures potentially impacting within each AQMA. Where relevant, transport schemes should be assessed in relation to their impact on air quality in AQMAs. The greatest challenges appear to be within AQMAs 1,2, 6 & 7, where there are estimates of between 23% and 49% reductions in emissions required to attain the air quality objectives.

Response: Where required the major schemes are subject to an Environmental Impact Assessment (EIA), and air quality is one of the triggering criteria. Each of the upcoming phases of the A629 corridor improvement schemes has been accompanied by air quality assessments. These have identified potential impacts on AQMA No. 1. The scheme is not anticipated to reduce nitrogen dioxide concentrations in the short term, but modelling is complicated by the staged nature of the scheme and the difficulty in predicting future traffic flows.

The [2018] ASR has highlighted that exceedances of the annual mean objective for nitrogen dioxide continue for AQMAs 1,2,3, 6 & 7. AQMAs 4 & 5 are now marginally below objective levels. Monitoring should continue at these locations to determine when changes to AQMA designation should be considered.

Response: Monitoring continues in all seven AQMAs. In AQMA 5 (Stump Cross) the monitoring point is not at the receptor closest to the road, and the distance-corrected concentration at that receptor is above the annual mean objective.

Additional exceedances outside of current AQMAs are noted at New Bank where the Council are expecting to declare an AQMA. Consideration should be given whether there may be exceedances of the hourly mean objective at this location.

Response: The tube LV-NBN, which has measured the highest annual mean, is at a location not representative of receptors for the hourly mean objective, although it is adjacent to a footway accessible by pedestrians. The Council does not consider that the hourly mean objective is at risk in this location.

Further exceedances outside of AQMAs are reported at three other locations:

- **Close to the M62**
- **Ainley Top**
- **Brighouse**

It is not clear whether these locations represent points of relevant exposure. Monitoring and further assessment should continue at these locations to establish the extent of the exceedances and level of relevant public exposure, before declaring further AQMAs.

Response: The locations close to the M62 and at Ainley Top are monitored by diffusion tubes LV-62E, LV-62W and LV-AT. These locations are not representative of relevant exposure and the Council does not intend to declare AQMAs here. The Brighouse diffusion tube is not specified.

We note the Council are expecting to produce a Targeted Feasibility Study to achieve reductions in emissions on the A62 at Cooper Bridge, as required by Defra. Progress with the study should continue to be reported in the next ASR.

Response: The Targeted Feasibility Study was submitted to the government before the deadline and the conclusion, that the link was already in compliance with the EU Limit Value, has been accepted.

Calderdale has taken forward a number of direct measures during the current reporting year of 2018 in pursuit of improving local air quality. Details of all measures completed, in progress or planned are set out in Table 3-B.

More detail on these measures can be found in the draft Air Quality Action Plan. Key completed measures are:

- Completion of Phase 1a of the A629 scheme, expected to reduce congestion through AQMA No. 1.
- Upgrading of local bus fleet to reduce emissions on key routes, including routes through AQMAs.

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

- Trial of green screen at a local school, with associated evaluation;
- Approval for Phase 1b of the A629 project;
- Further progress with EV recharging points and take-up of ULEVs.

In strategic terms the Council envisages that implementation of the Transport Strategy, Low Emissions Strategy and Local Plan will play a key role in tackling air quality issues in the longer term. These elements therefore underpin many of the key priorities identified in this report.

Calderdale's priorities for the coming year are:

- **Priority 1** - promoting alternatives to private vehicle use, recognising the contribution of diesel vehicles and bidding for ULEV funding whenever possible
- **Priority 2** – improving the transport network infrastructure, as set out in the Council's Transport Strategy and Local Plan
- **Priority 3** –developing awareness of impacts and remedies, and integrating the priorities of other strategies and frameworks, such as public health (active travel), sustainability (carbon reduction strategy) and local planning (sustainable development)
- **Priority 4** - encouraging public engagement and interest through improved communication and community involvement.

The principal challenges and barriers to implementation that Calderdale anticipates facing are:

- Availability of funding for all projects;
- Procurement of resources including land for road schemes;
- Securing suitable bids for contracts.

Progress on the following measures has been slower than expected:

- Eco Stars – funding arrangements are being reviewed
- Bus retrofitting – not all operators have bid for funds
- Cycling infrastructure – some land ownership issues encountered

Whilst the measures stated above and in Table 3-B will help to contribute towards compliance, Calderdale anticipates that further additional measures not yet prescribed will be required in subsequent years to achieve compliance and enable the revocation of any of its AQMAs.

Table 3-B – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
AQAP1 (1)	Achieve better understanding of local air quality, including monitoring and source apportionment	Transport Planning and Infrastructure	Other	Calderdale MBC, neighbouring authorities, tools from Defra	2009-2014	2009-2020	% data collection	Neutral	funding in place until 2019	ongoing	funding ends 2019
AQAP1 (2)	Traffic flow and network improvements,	Traffic Management	UTC, Congestion management, traffic reduction	CMBC, Highways England, neighbouring Las, WYCA	current	current	data collection	Neutral	Implementation on-going	ongoing	Funding
AQAP1 (3)	Urban Traffic Control (UTC) improvements	Traffic Management	UTC, Congestion management, traffic reduction	Calderdale MBC, neighbouring authorities	current	current	Decreased congestion on routes with air quality exceedances	Some reduction due to improved flows of traffic	Implementation on-going	To be included in major projects and Corridor Improvement Plans	Modified since original action plan
AQAP1 (4)	Handling emissions data (Emissions Factor Toolkit)	Transport Planning and Infrastructure	Other	Calderdale MBC, tools from Defra	NA	current	effectiveness of predictions	Neutral	Informs annual status report	Ongoing	None identified
AQAP2 (1)	Air Quality web pages - improve, e.g. include live data	Public Information	Via the Internet	Calderdale MBC	ongoing	ongoing	web traffic, customer satisfaction	indirect, may influence behaviour	web pages updated, work progressing on live data	Sep-19	Technical matters
AQAP2 (2)	Clean air campaign	Public information	Via internet/social media/other	Calderdale MBC	Apr-19	Jun-19	Social media analytics	Moderate impact	Agreed launch 20th June 2019	ongoing	N/A

Calderdale MBC

AQAP2 (3)	Investigate freight partnership	Freight and Delivery Management	Freight Partnerships for city centre deliveries	Kirklees MBC, Calderdale MBC, Highways England	current	2019 onwards	number of partners signed up	significant improvements in longer term	Preliminary work with operators	2021	Resources to engage with potential partners
AQAP3 (1)	Promote high occupancy travel	Transport Planning and Infrastructure	Strategic highway improvements, re-prioritising	Calderdale MBC, Neighbouring Authorities	ongoing	ongoing	To be determined	modest reduction in road emissions	Campaign 2018	ongoing	Resources and partner commitments
AQAP3 (2)	Cycling infrastructure improvements and facilities	Promoting Travel Alternatives	Promotion of cycling	Calderdale MBC	current	2018 onwards	kilometres of new cycle paths	significant improvements in longer term	Various schemes underway, some stalled	Ongoing	Funding and staffing resources and land ownership
AQAP3 (3)	Active Calderdale campaign	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	Calderdale MBC	current	ongoing	most active Borough in the North by 2024	low impact on emissions but reduced exposure	Work with design council/Sport England to support local schemes	2022	Commitment from communities
AQAP3 (4)	Metro travel card pool scheme	Alternatives to private vehicle use	Other	Calderdale MBC, Metro	current	ongoing	Number of staff car journeys replaced	Low initial impact	take-up increasing	ongoing	further cards purchased 2018
AQAP3 (5)	20mph areas	Traffic Management	Reduction of speed limits, 20mph zones	Calderdale MBC	Complete	2017	Number of 20mph zones	Possible small reduction in road traffic emissions	zones completed	completed 2017	NA
AQAP3 (6)	Car sharing promotion	Alternatives to private vehicle use	Car & lift sharing schemes	Calderdale MBC	2009-2014	2009-2020	number of car sharing partners	small reduction, behavioural change	car sharing scheme up and running - featured in Clean Air day 2018	ongoing	interest appears to be growing
AQAP4 (1)	ULEV procurement	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	Calderdale MBC	2018-2023	2023 onwards	% low emission/ ULEV vehicles in fleet	Reduction in emissions around schools	Some ULEVs procured	after 2023	Funding availability
AQAP4 (2)	EV recharging provision	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission	Calderdale MBC supported by OLEV etc.	current	current	Number of EV charging points	Reduced vehicle emissions	Implementation on-going	Date	Funding

Calderdale MBC

			Vehicles, EV recharging, Gas fuel recharging								
AQAP4 (3)	Retrofit school bus fleet	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Calderdale MBC, neighbouring authorities	2015	2017	Proportion of fleet retrofitted	Reduced vehicle emissions	Implementation on-going	Date	None
AQAP5 (1)	Travel plans	Promoting Travel Alternatives	Workplace Travel Planning	Calderdale MBC, neighbouring authorities	NA	Current	Number of workplaces with travel plans	Potential moderate in long term	With WYLES guidance	Ongoing	Need for section 106 agreement
AQAP5 (2)	School travel plans	Promoting Travel Alternatives	School Travel Plans	Calderdale MBC, neighbouring authorities	Review in 2020	2020 onwards	schools with travel plans	Mainly behavioural influence	Plan completed pre 2019	2020	Many schools not with Local Authority
AQAP5 (3)	Local Plan Air Quality Policies	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	Calderdale MBC	Current	2017 onwards	Policies applied to all developments	significant improvements in longer term	WYLES adopted and used	ongoing	WYLES includes AQ guidance for developers
AQAP5 (4)	Promote uptake of electric vehicles e.g. taxis	Promoting Low Emission Transport	Taxi emission incentives	Calderdale MBC	Begun 2017	2017 onwards	number of ULEV taxis	moderate, especially in town centres	1 operating further promotion in place	Ongoing	Engagement of license trade
AQAP5 (5)	Promote and support use of public transport and improved infrastructure	Promoting Low Emission Transport	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Calderdale MBC, WYCA	Begun 2018	2018 onwards	Passenger journeys on public transport	Potentially moderate in the longer term	Clean Bus Technology grants awarded and fleet being upgraded	2019	Funding
AQAP5(6)	Promote good practice is domestic burning	Policy guidance and development control	Other	Calderdale MBC and DEFRA	Current	Current	Number of complaints about smoke from chimneys	Significant local impact	Published on website	ongoing	Enforcement
AQAP6 (1)	Community renewable energy scheme	Promoting Low Emission Plant	Public Procurement of stationary combustion sources	Calderdale MBC	current	2019 onwards	number of schemes approved	significant improvements in longer term	Feasibility Modelling done	ongoing	Funding

Calderdale MBC

AQAP6(2)	Promote locally grown food, goods and services	Freight and Delivery Management	Other	CMBC, local partners including 'Incredible Edible'	current	2018 onwards	Policies applied to all developments	significant improvements in longer term	Council policy agreed & land use for growing promoted		Ongoing Community take up
AQAP6(3)	Improved energy efficiency	Other	Other	Calderdale MBC			Number of developments incorporating energy efficiency measures				
AQAP6(4)	Compliance checks for environmental permit	Promoting Low Emission Plant	Environmental permits	CMBC / Environment Agency	current	current	Level of compliance with permit conditions	Significant impact locally	Part A1, A2, B and Schedule 9 and 13 permits in place	ongoing	N/A
AQAP6(5)	Introduction of green screens	Transport/planning/infrastructure	Other	Calderdale MBC	Planning phase March 2019	current	NO2 monitoring	Moderate local impact	First installation May 2019	Ongoing	Finance
AQAP6(6)	Pilot school road closure	Transport/planning/infrastructure	Other	Calderdale MBC/Schools	Jun-19	Current	Air quality monitored	Significant local impact	Plans in place	Ongoing	Community support
AQAP6(7)	Tackle idling vehicles	Traffic management	Congestion management/traffic reduction	Calderdale MBC	Planning phase current	Ongoing	Number of idling vehicles in key destinations	Moderate local impact	Confirming legal orders	Ongoing	Compliance and resource

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

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

Calderdale Council is taking the following measures to address PM_{2.5}:

- **Biomass combustion (including domestic wood burning).** The Council continues to support Defra's information campaign on domestic emissions and has incorporated guidance on appropriate selection of fuels on its web pages. Burning of garden waste is discouraged where appropriate, and a green waste collection service is in operation with a 10% increase in uptake on the previous year. Much of urban Calderdale is covered by Smoke Control Areas, and the Council offers advice to householders about how to comply with the orders and where to seek further information. The number of domestic wood burning appliances is thought to be increasing in Calderdale, but no figures are available.
- **Industrial sources.** The Council is working with local operators who hold environmental permits for combustion plant to ensure that emissions are controlled in accordance with the permits and, where feasible, to a tighter standard. The number of applications for small waste incineration plant has increased in the past year. A number of premises burning waste below the permitting threshold have been identified and given advice about obtaining a U4 exemption and reducing the smoke emissions from their appliances. The Council is working with the Environment Agency to identify and regularise waste burning in the Borough. Some RHI funded schemes have also been identified and the Council is working with its partners in the Yorkshire and Lincolnshire Pollution Advisory Group to understand what regulation may be achievable.
- **Public information.** The Council has used publicity materials to inform the public about better travel choices, and in particular avoiding private vehicle use where possible. Fine particulates from brake and tyre wear are becoming the focus of more attention, and encouraging people to use alternative transport modes and active travel may assist with this.

Measures set out in the Action Plan to tackle nitrogen dioxide pollution are also expected to reduce concentrations of particulates. Guidance (such as [DE19C]) on open fires and wood burning is also relevant to tackling fine particulates. PM_{2.5} concentrations tend to have significant regional contributions and the local measures may have limited impact.

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

4.1 Summary of Monitoring Undertaken

4.1.1 Automatic Monitoring Sites

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

Calderdale undertook automatic (continuous) monitoring at three sites during 2018. Table A.1 in Appendix A shows the details of the sites. NB. Local authorities do not have to report annually on the following pollutants: 1,3 butadiene, benzene, carbon monoxide and lead, unless local circumstances indicate there is a problem. National monitoring results are available through the web.

AQS2 is located within Calderdale No. 1 AQMA (Salterhebble)

AQS3 is located within Calderdale No. 3 AQMA (Hebden Bridge)

AQS4 is located within Calderdale No. 2 AQMA (Sowerby Bridge)

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

4.1.2 Non-Automatic Monitoring Sites

Calderdale undertook non- automatic (passive) monitoring of NO₂ using diffusion tubes at around 60 sites during 2018, although some of the sites were not monitored for the full year. Table A.2 in Appendix A shows the details of the sites.

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

4.2 Individual Pollutants

The air quality monitoring results presented in this section are, where relevant, adjusted for bias, “annualisation” and distance correction. Further details on adjustments are provided in Appendix C.

4.2.1 Nitrogen Dioxide (NO₂)

Table A.3 in Appendix A compares the ratified and adjusted monitored NO₂ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

For diffusion tubes, the full 2018 dataset of monthly mean values is provided in Appendix B.

Table 4 in Appendix A compares the ratified continuous monitored NO₂ hourly mean concentrations for the past 5 years with the air quality objective of 200µg/m³, not to be exceeded more than 18 times per year.

Commentary: The results show that the annual mean objective for nitrogen dioxide is being breached within all the AQMAs with the exception of Calderdale No. 5 AQMA at Stump Cross, monitored using tube SC5. This diffusion tube is on a residential property within the AQMA and the 2018 mean was $39\mu\text{gm}^{-3}$. The NO_2 falloff with distance calculator (version 4.2) indicates that the annual mean at the receptor closest to the road was around $42\mu\text{gm}^{-3}$. The difference in elevations of the sites introduces some uncertainty.

Exceedances of the annual mean objective have also been measured at the A58 New Bank, Halifax, which is to be declared an AQMA following consultation. Tube LV-NBX is on a street lighting column adjacent to the A58 and is not representative of exposure for the annual mean objective. However, it is accessible to pedestrians and may be representative of exposure at bus stops on this stretch of road. There are no recreational or other facilities close to the road that would attract receptors for the hourly mean objective.

Monitoring in Mytholmroyd (diffusion tubes MY01 to MY05) indicates that the annual mean objective was exceeded at two sites, both close to the roadside where standing traffic has been present for long periods, particularly during the flood relief works. The result for MY01 suggests that the hourly mean objective was not exceeded in 2018.

Figure 1 shows the diffusion tube measurements at Sowerby Bridge (bias corrected) since 2012. While there has clearly been a fall over that period the results for 2018 are similar to those for 2017. The picture is similar for Brighouse (Figure 2) and other diffusion tube sites in the Borough.

Figure 1 Sowerby Bridge diffusion tubes (μgm^{-3})

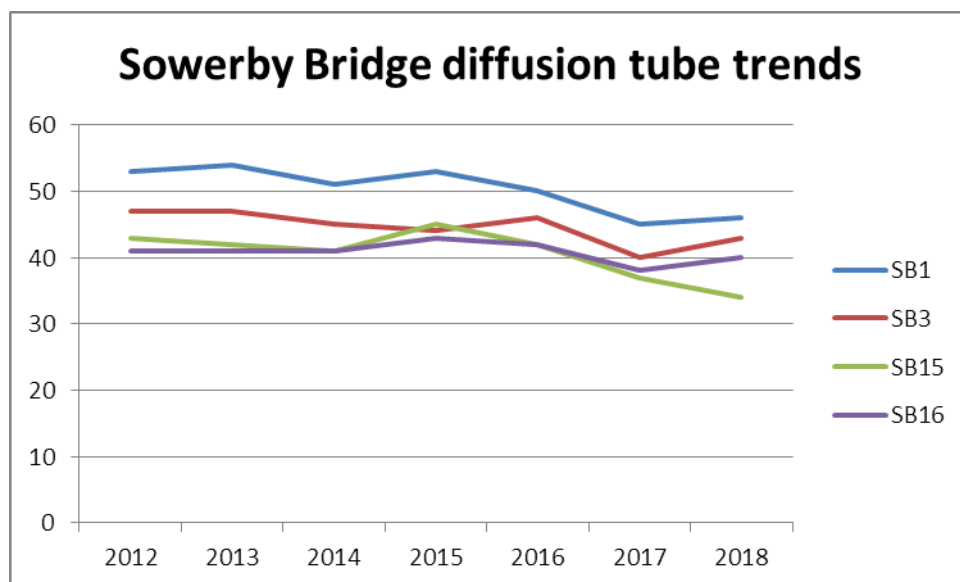
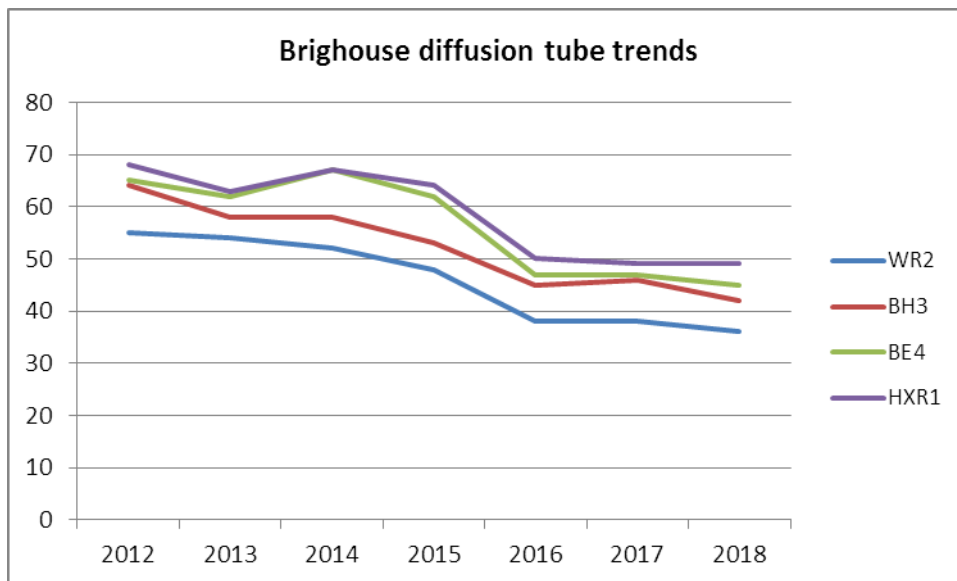


Figure 2 Brighouse diffusion tube trends



4.2.2 Particulate Matter (PM₁₀)

Table A.5 1 in Appendix A compares the ratified and adjusted monitored PM₁₀ annual mean concentrations for the past 5 years with the air quality objective of 40µg/m³.

Table A.5 2 in Appendix A compares the ratified continuous monitored PM₁₀ daily mean concentrations for the past 5 years with the air quality objective of 50µg/m³, not to be exceeded more than 35 times per year.

Commentary: The monitoring results show that neither of the objectives were breached in 2018, and that the trend is level at this location.

4.2.3 Particulate Matter (PM_{2.5})

Table A.6 in Appendix A presents the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past 5 years.

Commentary: Neither site shows a downward trend in the annual mean over the years for which monitoring data are available. This reflects the situation nationally as depicted by DEFRA [DE19A], with PM_{2.5} concentrations stable or rising slightly.

Appendix A: Monitoring Results

Table A.1 – Details of Automatic Monitoring Sites

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Monitoring Technique	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Inlet Height (m)
AQS2	Huddersfield Road	Roadside	409485	423430	NO ₂ ; PM _{2.5}	YES	Chemiluminescent; BAM	NA	3	1.5
AQS3	Hebden Bridge	Roadside	398990	427210	NO ₂ ; PM _{2.5}	YES	Chemiluminescent; BAM	NA	3	1.5
AQS4	Sowerby Bridge	Roadside	406075	423615	NO ₂ ; PM ₁₀	YES	Chemiluminescent; BAM	NA	3	1.5

Notes:

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

(2) N/A if not applicable.

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

Site ID	Site Name	Site Type	X OS Grid Ref	Y OS Grid Ref	Pollutants Monitored	In AQMA?	Distance to Relevant Exposure (m) ⁽¹⁾	Distance to kerb of nearest road (m) ⁽²⁾	Tube collocated with a Continuous Analyser?	Height (m)
LV-SAA	LV-SAA	Roadside	411201	419429	NO2	no	NA	NA	NO	2.5
LV-SCA	LV-SCA	Roadside	405911	416597	NO2	no	NA	NA	NO	1
LV-AT	LV-AT	Roadside	411533	419358	NO2	no	NA	4	NO	2.5
LV-62W	LV-62W	Roadside	416172	422282	NO2	no	NA	3	NO	2.5
LV-62E	LV-62E	Roadside	416717	422113	NO2	no	NA	4	NO	2.5
LV-LEE	LV-LEE	Roadside	417698	420709	NO2	no	NA	3	NO	2
LV-BRD	LV-BRD	Roadside	414683	423155	NO2	no	NA	2	NO	2
LV-NBN	LV-NBN	Roadside	409715	425754	NO2	no	NA	1	NO	2.5
LV-NBS	LV-NBS	Roadside	409708	425737	NO2	no	NA	2	NO	2.5
LV-NBX	LV-NBX	Roadside	409602	425797	NO2	no	NA	1	NO	2.5
LV-EWB	LV-EWB	Roadside	410104	421516	NO2	no	NA	1	NO	2.5
NB-NB1	NB-NB1	Roadside	409663	425740	NO2	no	2	2	NO	2.5
NB-GR	NB-GR	Roadside	409957	425642	NO2	no	3	3	NO	2
NB-GL	NB-GL	Roadside	410367	425975	NO2	no	11	2	NO	2.5
SC5	SC5	Roadside	410823	426265	NO2	yes	0	3	NO	3
HH-TC	HH-TC	Roadside	412718	425556	NO2	yes	5	1.5	NO	2.5
HH-LB	HH-LB	Roadside	412430	425479	NO2	yes	0	4	NO	2
HH-LT	HH-LT	Roadside	412450	425435	NO2	yes	0	3	NO	2.5
HH1	HH1	Roadside	412618	425503	NO2	yes	0	3	NO	2

WR2	WR2	Roadside	415090	422817	NO2	yes	0	4	NO	2.5
BH3	BH3	Roadside	414671	422740	NO2	yes	3	1.5	NO	2.5
BE4	BE4	Roadside	414478	422692	NO2	yes	0	1	NO	2.5
BE2	BE2	Roadside	414385	422457	NO2	yes	NA	2	NO	2.5
HXR1	HXR1	Roadside	414218	422957	NO2	yes	0	4	NO	2
CL1	CL1	Roadside	413261	420686	NO2	no	0	2	NO	2.5
HTAH	HTAH	Suburban	411494	419594	NO2	no	0	NA	NO	2
AT-BR	AT-BR	Suburban	411514	419548	NO2	no	10	NA	NO	2
AT-MR	AT-MR	Roadside	411581	419373	NO2	no	10	NA	NO	2.5
AT-MR2	AT-MR2	Roadside	411530	419377	NO2	no	12	9	NO	1.5
AQC1	AQC1	Roadside	409485	423431	NO2	yes	5	2	YES	1.5
AQC2	AQC2	Roadside	409485	423431	NO2	yes	5	2	YES	1.5
AQC3	AQC3	Roadside	409485	423431	NO2	yes	5	2	YES	1.5
CRH1	CRH1	Roadside	409767	423011	NO2	yes	0	2	NO	2.5
AQ20	AQ20	Roadside	409483	423337	NO2	no	0	5	NO	2
AQ21	AQ21	Roadside	409822	423167	NO2	yes	2	2	NO	2.5
HB6	HB6	Roadside	399502	427041	NO2	yes	0	4	NO	2
HQ1	HQ1	Roadside	398794	427237	NO2	yes	0	3	NO	2
HQ9	HQ9	Roadside	399236	427176	NO2	yes	0	2	NO	2.5
LF1	LF1	Roadside	403810	424977	NO2	yes	0	2	NO	2.5
LF2	LF2	Roadside	403738	425110	NO2	yes	0	1	NO	2.5
SB1	SB1	Roadside	406135	423639	NO2	yes	0	2	NO	2.5
SB3	SB3	Roadside	405961	423571	NO2	yes	0	2	NO	2.5
SB15	SB15	Roadside	406707	423824	NO2	yes	1	2	NO	2

SB16	SB16	Roadside	406638	423836	NO2	yes	0	2	NO	2.5
SB18	SB18	Roadside	406936	423800	NO2	no	0	5	NO	2.5
SB20	SB20	Roadside	405825	423415	NO2	yes	0	2	NO	2.5
SB21	SB21	Urban Background	406035	423442	NO2	no	>10	NA	NO	2.5
SB22	SB22	Roadside	405823	423395	NO2	yes	0	2	NO	2
BS1 HB	BS1 HB	Roadside	398990	427210	NO2	yes	>10	3	YES	1.5
WV-SR1	WV-SR1	Roadside	409598	421167	NO2	no	0	2	NO	2.5
WV-SR2	WV-SR2	Roadside	409608	421160	NO2	no	3	2	NO	2.5
NB-RB	NB-RB	Urban Background	409453	425835	NO2	no	5	NA	NO	2
NB-SJ	NB-SJ	Other	409624	425798	NO2	no	NA	NA	NO	2
MY01	MY01	Roadside	401431	425995	NO2	NO	0	1		2.5
MY02	MY02	Urban Background	401275	426046	NO2	NO	NA	>10	NO	2.5
MY03	MY03	Roadside	401204	426041	NO2	NO	0	2	NO	2.5
MY-04	MY-04	Roadside	401059	426179	NO2	NO	NA	2	NO	2.5
MY-05	MY-05	Roadside	401040	426186	NO2	NO	NA	2	NO	2.5
CR	CR	Urban Background	409471	425712	NO2	NO	0	>10	NO	2.5
PSN	PSN	Urban Background	409504	425743	NO2	NO	10	>10	NO	2.5

Notes:

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

(2) N/A if not applicable.

Table A.3 – Annual Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2014	2015	2016	2017	2018
LV-SAA	Roadside	Diffusion Tube	100	100	-		31	33	30
LV-SCA	Roadside	Diffusion Tube	100	100	-		56	48	46
LV-AT	Roadside	Diffusion Tube	100	100	-		54	47	47
LV-62W	Roadside	Diffusion Tube	100	100	-		43	40	40
LV-62E	Roadside	Diffusion Tube	100	100	-		42	40	38
LV-LEE	Roadside	Diffusion Tube	100	100	-		32	32	30
LV-BRD	Roadside	Diffusion Tube	100	100	-		28	31	28
LV-NBN	Roadside	Diffusion Tube	100	100	-		<u>67</u>	<u>66</u>	<u>64</u>
LV-NBS	Roadside	Diffusion Tube	100	100	-		55	42	44
LV-NBX	Roadside	Diffusion Tube	100	100	-		46	43	39
LV-EWB	Roadside	Diffusion Tube	100	100	-		30	27	27
NB-NB1	Roadside	Diffusion Tube	100	100	-			44	42
NB-GR	Roadside	Diffusion Tube	100	100	-			53	53
NB-GL	Roadside	Diffusion Tube	100	100	-			57	52
SC5	Roadside	Diffusion	100	100	47	45	43	38	39

		Tube							
HH-TC	Roadside	Diffusion Tube	100	100		40	42	36	35
HH-LB	Roadside	Diffusion Tube	100	100	35	43	45	36	37
HH-LT	Roadside	Diffusion Tube	100	100	43	46	58	51	48
HH1	Roadside	Diffusion Tube	100	100	41	42	42	39	38
WR2	Roadside	Diffusion Tube	100	100	41	40	41	38	36
BH3	Roadside	Diffusion Tube	100	100	39	45	48	46	42
BE4	Roadside	Diffusion Tube	100	100	43	52	50	47	45
BE2	Roadside	Diffusion Tube	100	100		42	45	38	37
HXR1	Roadside	Diffusion Tube	100	100	35	54	53	49	49
CL1	Roadside	Diffusion Tube	100	100	56	38	43	34	33
HTAH	Roadside	Diffusion Tube	100	100	30	35	38	35	31
AT-BR	Roadside	Diffusion Tube	100	100	31	35	37	35	30
AT-MR	Roadside	Diffusion Tube	100	100		29	30	34	27
AT-MR2	Roadside	Diffusion Tube	100	100				34	32
AQC1	Roadside	Diffusion Tube	100	100	-	45	46	41	36
AQC2	Roadside	Diffusion Tube	100	100	-	50	46	43	36
AQC3	Roadside	Diffusion Tube	100	100	-	47	46	41	36

CRH1	Roadside	Diffusion Tube	100	100	50	53	54	52	52
AQ20	Roadside	Diffusion Tube	100	100	28	29	30	24	24
AQ21	Roadside	Diffusion Tube	100	100	-	53	50	48	45
HB6	Roadside	Diffusion Tube	100	100	43	40	38	35	31
HQ1	Roadside	Diffusion Tube	100	100	35	54	52	50	46
HQ9	Roadside	Diffusion Tube	100	100	50	42	42	36	39
LF1	Roadside	Diffusion Tube	100	100	40	46	46	39	41
LF2	Roadside	Diffusion Tube	100	100	45	38	38	35	34
SB1	Roadside	Diffusion Tube	100	100	36	53	50	45	46
SB3	Roadside	Diffusion Tube	100	100	51	44	46	40	43
SB15	Roadside	Diffusion Tube	100	100	38	45	42	37	34
SB16	Roadside	Diffusion Tube	100	100	41	43	42	38	40
SB18	Roadside	Diffusion Tube	100	100	41	36	35	44	
SB20	Roadside	Diffusion Tube	100	100	34	47	46	62	
SB21	Roadside	Diffusion Tube	100	100	-	24	28	28	
SB22	Roadside	Diffusion Tube	100	100	-	45	48	42	45
BS1 HB	Roadside	Diffusion Tube	100	100	-		42	38	37
WV-SR1	Roadside	Diffusion Tube	100	100	-			39	38

WV-SR2	Roadside	Diffusion Tube	100	100	-			29	31
NB-RB	Roadside	Diffusion Tube	100	100	-			23	25
NB-SJ	Roadside	Diffusion Tube	100	100	-			24	28
MY01	Roadside	Diffusion Tube	100	100	-				52
MY02	Urban Background	Diffusion Tube	100	100	-				24
MY03	Roadside	Diffusion Tube	100	58	-				42
MY-04	Urban Background	Diffusion Tube	58	58	-				29
MY-05	Roadside	Diffusion Tube	58	58	-				33
CR	Urban Background	Diffusion Tube	42	42	-				23
PSN	Urban Background	Diffusion Tube	42	42	-				23
AQS2	Roadside	Automatic	75	75	-			48	39
AQS3	Roadside	Automatic	96	96	-			37	35
AQS4	Roadside	Automatic	94	94	-			36	38

Diffusion tube data has been bias corrected

Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

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

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

Figure 3 Trends in Annual Mean NO₂ Concentrations at AQS2, Halifax

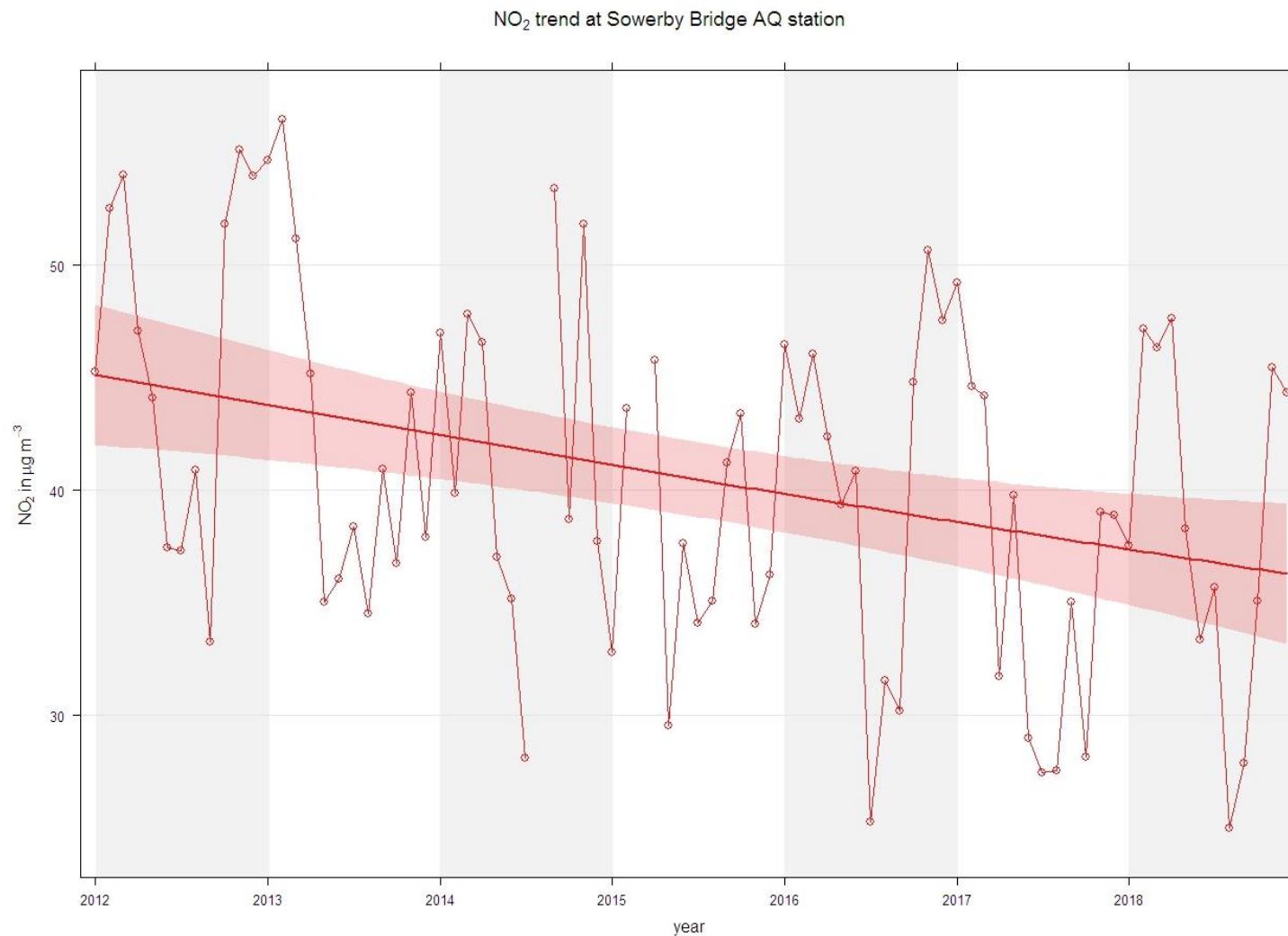


The trend indicated in Figure A.1 is generally downwards, but the 2018 data must be treated with caution, as described in the text.

Figure 4 Trends in Annual Mean NO₂ Concentrations at AQS3, Hebden Bridge

The trend is a fairly consistent downward one, but major roadworks on the A646 during 2018 (and ongoing) may be distorting the picture.

Figure 5 Trends in Annual Mean NO₂ Concentrations at AQS4, Sowerby Bridge



Again, the trend appears consistently downward, and the impact of roadworks is likely to be less of a confounding factor at this location.

Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2014	2015	2016	2017	2018
AQS2	Roadside	Automatic	75	75	10	2	0	0	4 (128)
AQS3	Roadside	Automatic	96	96	0	0	0	0	0
AQS4	Roadside	Automatic	94	94	0	0	0	0	1

Notes:

Exceedances of the NO₂ 1-hour mean objective (200µg/m³ not to be exceeded more than 18 times/year) are shown in **bold**.

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

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

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

In 2018 there were no exceedances of this objective at any of the monitored sites, a picture that continues the trend over all the monitored years.

Table A.5 1– PM₁₀ monitoring results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
AQS4	Roadside	100	100		25	25	23	25

Annualisation has been conducted where data capture is <75%

Notes:

Exceedances of the PM₁₀ annual mean objective of 40µg/m³ are shown in **bold**.

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

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

(3) Annualisation is not required as per Boxes 7.9 and 7.10 in LAQM.TG16, as valid data capture for the full calendar year was better than 75%. See Appendix C for details.

Table A.5 2 – 24-Hour Mean PM₁₀ Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM ₁₀ 24-Hour Means > 50µg/m ³ ⁽³⁾				
				2014	2015	2016	2017	2018
AQS4	Roadside	94	94			15	8	12

Notes:

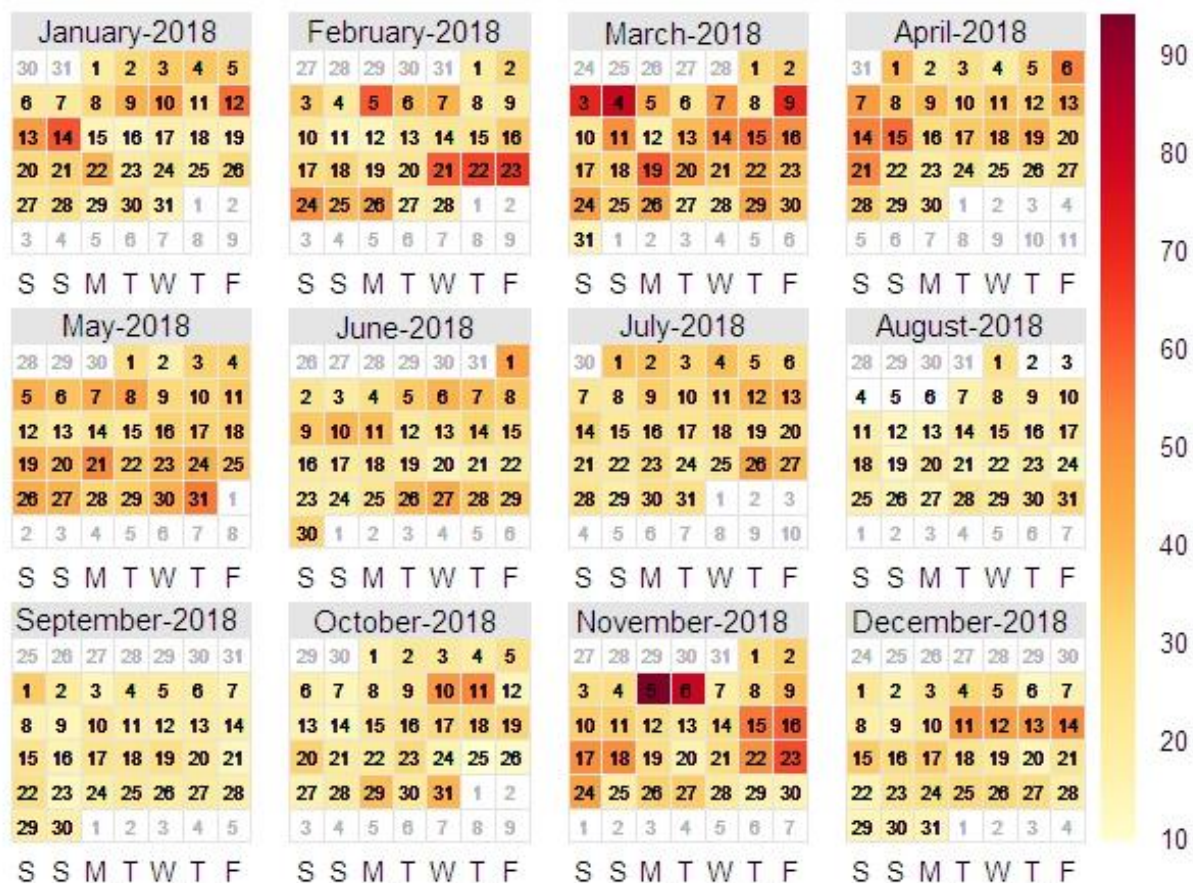
Exceedances of the PM₁₀ 24-hour mean objective (50µg/m³ not to be exceeded more than 35 times/year) are shown in **bold**.

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

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

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

Figure A.1 – calendar of PM₁₀ concentrations at Sowerby Bridge during 2018



Although March had several periods of daily means greater than 50µg/m³ the highest concentrations occurred around Bonfire Night.

Table A.6 – PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2018 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2014	2015	2016	2017	2018
AQS2	Roadside	74	74		11	13	13	13
AQS3	Roadside	98	98		11	17	15	17

Annualisation has been conducted where data capture is <75%

Notes:

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

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

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

Appendix B: Full Monthly Diffusion Tube Results for 2018

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

Site ID	NO ₂ Mean Concentrations (µg/m ³)												Annual Mean		
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Raw Data	Bias Adjusted (0.8) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾
LV-SAA	46.0	43.0	42.0	38.0	30.0	30.0	25.0	32.0	36.0	32.0	44.0	45.0	36.9	30	30
LV-SCA	81.0	74.0	65.0	64.0	29.0	38.0	32.0	63.0	72.0	56.0	50.0	73.0	58.1	46.0	NA
LV-AT	75	73	76	52	56	36	57	47	50	62	66	59	59.1	47.0	47.0
LV-62W	65	66	60	59	47	34	37	42	44	53	44	54	50.4	40.0	NA
LV-62E	58	65	56	53	44	18	35	48	42	40	52	55	47.2	38.0	NA
LV-LEE	40	52	43	34	33	27	29	37	39	39	38	45	38.0	30.0	NA
LV-BRD	40	45	37	32	28	27	21	29	31	34	44	46	34.5	28.0	28.0
LV-NBN	93	118	89	76	77	57	91	72	71	64	76	78	80.2	64.0	NA
LV-NBS	63	64	57	28	54	44	61	56	59	59	60	61	55.5	44.0	NA
LV-NBX	67	62	50	35	49	37	45	49	48	48	42	59	49.3	39.0	39.0
LV-EWB	47	41	44	37	28	14	26	25	26	29	47	44	34.0	27.0	27.0
NB-NB1	54	65	60	47	48	35	44	51	54	49	55	62	52.0	42.0	42.0
NB-GR	82	89	68	65	70	55	49	53	65	64	67	66	66.1	53.0	54.0
NB-GL	77	64	67	66	61	53	50	74	61	71	74	69	65.6	52.0	52.0
SC5	42	58		60	58		52	38	40	45	42	53	48.8	39.0	42.3

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HH-TC	51	51	53	46	40	36	38	30	41	39	51	56	44.3	35.0	35.0
HH-LB	57	58	58	38	54	44	34	36	42	44	44		46.3	37.0	37.0
HH-LT	73	55	61	60	53	49	50	59		65	63	76	60.4	48.0	48.0
HH1	56	57	50	48	42	37	48	45	42	37	53	56	47.6	38.0	38.0
WR2	61	62	49	40	27	33	41	39	43	37	57	54	45.3	36.0	36.0
BH3	72	71	55	46	49	43		49	43	48	48	57	52.8	42.0	42.0
BE4	66	66	51	63	53	42	60	56	56	53	47	69	56.8	45.0	45.0
BE2	60	54	49	50	38	34	35	40	42	35	54	61	46.0	37.0	37.0
HXR1	64	65	53	67	70	56	65	66	61	52	53	63	61.3	49.0	49.0
CL1	46	52	41	36	38	39	41	33	37	38	43	46	40.8	33.0	33.0
HTAH	38	37	33	46	46	35	32	37	39	32	42	44	38.4	31.0	31.0
AT-BR	48	46	41	39	36	27	29	38	33	38	36	43	37.8	30.0	30.0
AT-MR	44	43	39	37	31	19	30		34	31	24	41	33.9	27.0	27.0
AT-MR2	41	45	52	39	32	17	37	40	42	41	42	47	39.6	32.0	32.0
AQC1	46	39	36	47	54		39	37	46	50	52	50	45.1	36.0	36.0
AQC2	46	36	37	56	54	30	41	36	48	51	40	63	44.8	36.0	36.0
AQC3	42	37	37	59	56	23		35	50	46	49	58	44.7	36.0	36.0
CRH1	79	68	75	71	66	50	71	57	61	62	47	67	64.5	52.0	52.0
AQ20	36	38	35	28	30	26	28	23	25	27	32	36	30.3	24.0	24.0
AQ21	66	64	51	56	50	39	61	57	53	50		71	56.2	45.0	45.0
HB6	45	48	46	40	37	34	40	34	32	37	24	42	38.3	31.0	31.0
HQ1	69	71	57	68	56	47	56	54	55	51	41	64	57.4	46.0	46.0
HQ9	60	59	53	48	46	39	46	38	40	45	50	55	48.3	39.0	39.0
LF1	65	59	64	50	58	42	49	43	39	44	53	52	51.5	41.0	41.0
LF2	49	58	46	42	40	31	40	37	34	41	41	45	42.0	34.0	34.0
SB1	63	72	62	59	62	52	52	48	54	52	62	51	57.4	46.0	46.0
SB3	59	68	65	60	60	43	53	38	37	46	63	48	53.3	43.0	43.0

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SB15	8	61	53	52	41	35	39	38	35	43	51	54	42.5	34.0	34.0
SB16	50	67	60	48	54	40	47	40	39	44	57	51	49.8	40.0	40.0
SB22	60	57	60	55	57	49	54	40	46	48	60	82	55.7	45.0	45.0
BS1 HB	57	60	53	51	36	40	41	33	33	41	54	50	45.8	37.0	37.0
WV-SR1	56	58	54	48	42	33	45	42	46	37	49	60	47.5	38.0	38.0
WV-SR2	47	50	52	37	36	30	35	27	29	33	40	48	38.7	31.0	31.0
NB-RB	40	38	37	31	18	23							31.2	25.0	25.0
NB-SJ	40	39	40	27	34	30							35.0	28.0	28.0
MY01						61	61	56	57	56	67	59	59.6	52.0	52.0
MY02						19	25	25	22	25	34	38	26.9	24.0	24.0
MY03						43	47	46	38	43	65	54	48.0	42.0	42.0
MY-04								26	34	33	31	43	33.4	29.0	29.0
MY-05								33	37	29	43	47	37.8	33.0	33.0
CR							29	29					29.0	23.0	23.0
PSN							29	29					29.0	23.0	23.0

- Local bias adjustment factor used
- National bias adjustment factor used
- Annualisation has been conducted where data capture is <75%
- Where applicable, data has been distance corrected for relevant exposure

Notes:

Exceedances of the NO₂ annual mean objective of 40µg/m³ are shown in **bold**.

NO₂ annual means exceeding 60µg/m³, indicating a potential exceedance of the NO₂ 1-hour mean objective are shown in **bold and underlined**.

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

(2) Distance corrected to nearest relevant public exposure for the annual mean objective. Only applied to SC5. NA indicates no receptors for this objective close to site.

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

C1. Overview of continuous monitoring

The continuous monitoring station at Salterhebble measures nitrogen oxides and fine particulate matter (PM_{2.5}). The station is referred to as AQS2.

The continuous monitoring station at Hebden Bridge measures nitrogen oxides and fine particulate matter (PM_{2.5}). The station is referred to as AQS3.

The continuous monitoring station in Sowerby Bridge measures nitrogen oxides and particulate matter (PM₁₀). This station is referred to as AQS4.

C.2 Supply and analysis of nitrogen dioxide diffusion tubes

The nitrogen dioxide diffusion tubes are supplied and analysed by West Yorkshire Analytical Services. The tubes are prepared with 50% TEA in acetone. West Yorkshire Analytical Services AIR-PT (which includes the former WASP scheme) scores improved from the 2015 findings, although they were not consistently 100% for 2018. The Council is satisfied that the laboratory has appropriate quality assurance procedures in respect of the analyses.

A “travel blank” is submitted for analysis with each batch of tubes, and the concentrations recorded for this tube have been consistently negligible in 2018.

C.3 Maintenance and data preparation and analysis

The automatic analysers are covered by a maintenance and callout contract, which allows for six-monthly maintenance visits and callouts for instrument faults. Council staff visit the sites every two weeks to check for faults and to check the instrument nitrogen oxides span and zeros. Staff have been trained to change the BAM tapes, and to clean the inlet and nozzle between service visits. There were no significant problems with the operation of AQS3 and AQS4 during 2018. AQS2 was turned off for three months due to major roadworks on the A629 in early 2018, but operated satisfactorily for the remainder of the year.

The measurements from all three automatic sites are collected using WinAQMS and Airodis software. It is checked for obvious errors and outliers and backed up to the Council's secure network. For analysis the data is first conditioned using a spreadsheet. This involves scaling the raw data using the span and zero values obtained on site every two weeks, checking for obvious items such as values well below zero or long periods of missing data, and marking these abnormal values.

Particulate matter measurements are made using a beta attenuation monitor (BAM) with the appropriate inlets for PM₁₀ or PM_{2.5}. Data is collected using the same system as the nitrogen dioxide analysers.

Periods embedded within long sections of missing data may need to be removed from the data as they are likely to be affected by instrument faults (and this is normally picked up during routine checks). Periods known to be affected by instrument faults are also removed. The data may then be put into a suitable format for importing into the open source software package “openair” ([R17], [CR12], [CR16]), or manipulated in a spreadsheet. The Council has chosen to use “openair” due to the range of analysis tools, ease of data manipulation and simple production of graphics.

Dealing with missing data is a delicate problem, but the data for 2018 was almost complete for AQS3 and AQS4. The data from AQS2 have been annualised using the data from AQS3.

C4 Choice of bias correction factor for 2018

The Council runs a local colocation study at AQS2, Huddersfield Road. In June 2017 major work started on a highways improvement project (A629 Phase 1a). There was disruption to traffic flows on this stretch of road until August 2018, and the monitoring station was switched off for around three months in early 2018 to allow for the works. For these reasons the colocation study has not been run in 2018

The national bias correction factor was therefore adopted in this report. Spreadsheet version 03/19 was used to determine this factor.

C5 Annualisation of diffusion tube results

The results of the tubes MY-01 MY-02 and MY-03 (which were exposed from June to December) have been annualised using a factor (PF1) derived from other diffusion tubes on the A646. MY-04 and MY-05 have been annualised using the factor PF2.

Table 0-A: annualisation factors PF1 and PF2

Tube	Annual mean	Mean Jun-Dec	PF1	Mean Aug-Dec	PF2
HB6	38.25	34.71429	1.101852	33.8	1.131657
HQ1	57.41667	52.57143	1.092165	53	1.083333
HQ9	48.25	44.71429	1.079073	45.6	1.058114
LF1	51.5	46	1.119565	46.2	1.114719
LF2	42	38.42857	1.092937	39.6	1.060606
Averaged factors			1.10		1.09

C6 Correction for distance of closest receptor

Many of the diffusion tubes are located close enough to receptors not to require correction. Other tubes are not representative of receptors (e.g. background tubes) and correction for distance is not appropriate. For other tubes the limitations of the falloff with distance calculator rule out correction.

The diffusion tube SC5 is on a dwelling but there is a receptor that is closer to the carriageway of the A58 at a busy junction. Although the annual mean for 2018 was below the objective at SC5 the calculator indicates that the objective is not being met at the closer receptor, as set out in Figure 6.

Figure 6: falloff with distance calculator for tube SC5





Enter data into the pink cells

Step 1	How far from the KERB was your measurement made (in metres)?	3.6	metres
Step 2	How far from the KERB is your receptor (in metres)?	2.3	metres
Step 3	What is the local annual mean background NO ₂ concentration (in µg/m ³)?	12.2	µg/m ³
Step 4	What is your measured annual mean NO ₂ concentration (in µg/m ³)?	39	µg/m ³
Result	The predicted annual mean NO ₂ concentration (in µg/m ³) at your receptor	42.3	µg/m ³

Notes: the monitoring location and the receptor are within 10m of each other, although the elevations are different, with tube SC5 elevated by around 2m with respect to the closer receptor. The receptor is a detached house adjacent to the road junction. Background concentrations were taken from the 2017 background maps for 2018.

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

The following symbols have been used in the maps:

-  AQMA boundary.
-  or  Diffusion tube exposed in 2018.
-  Diffusion tube exposed before 2018 and discontinued.

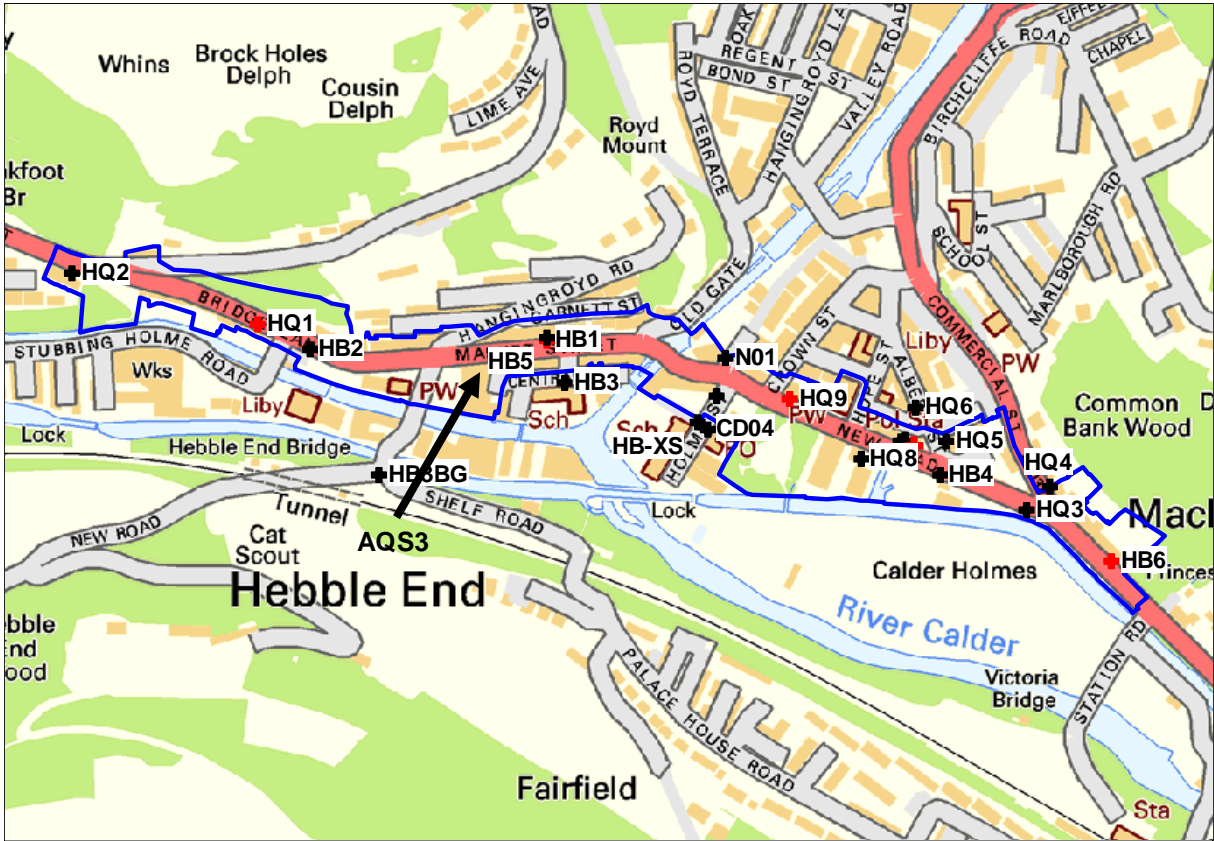


Figure 7: diffusion tubes and station AQS3 in Hebble Bridge (AQMA No.3)

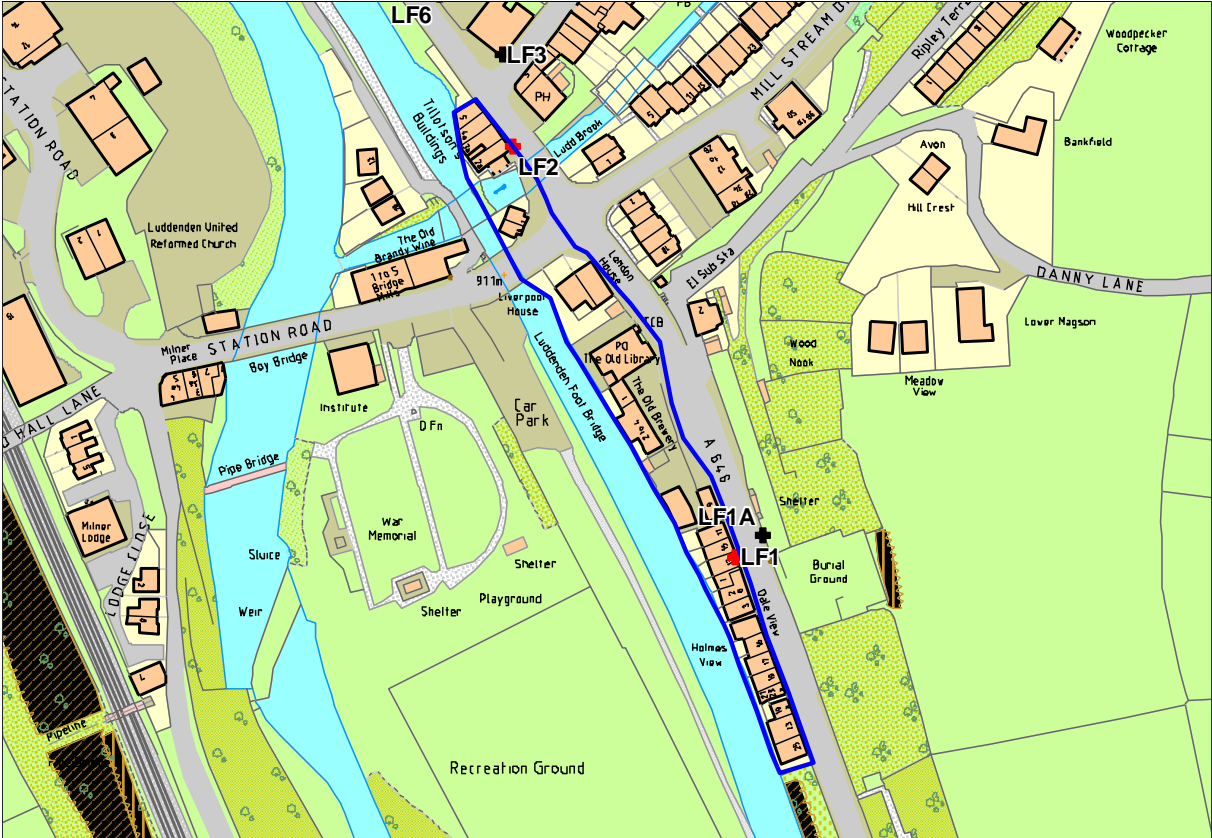


Figure 8: diffusion tubes in Luddendenfoot (AQMA No. 4)

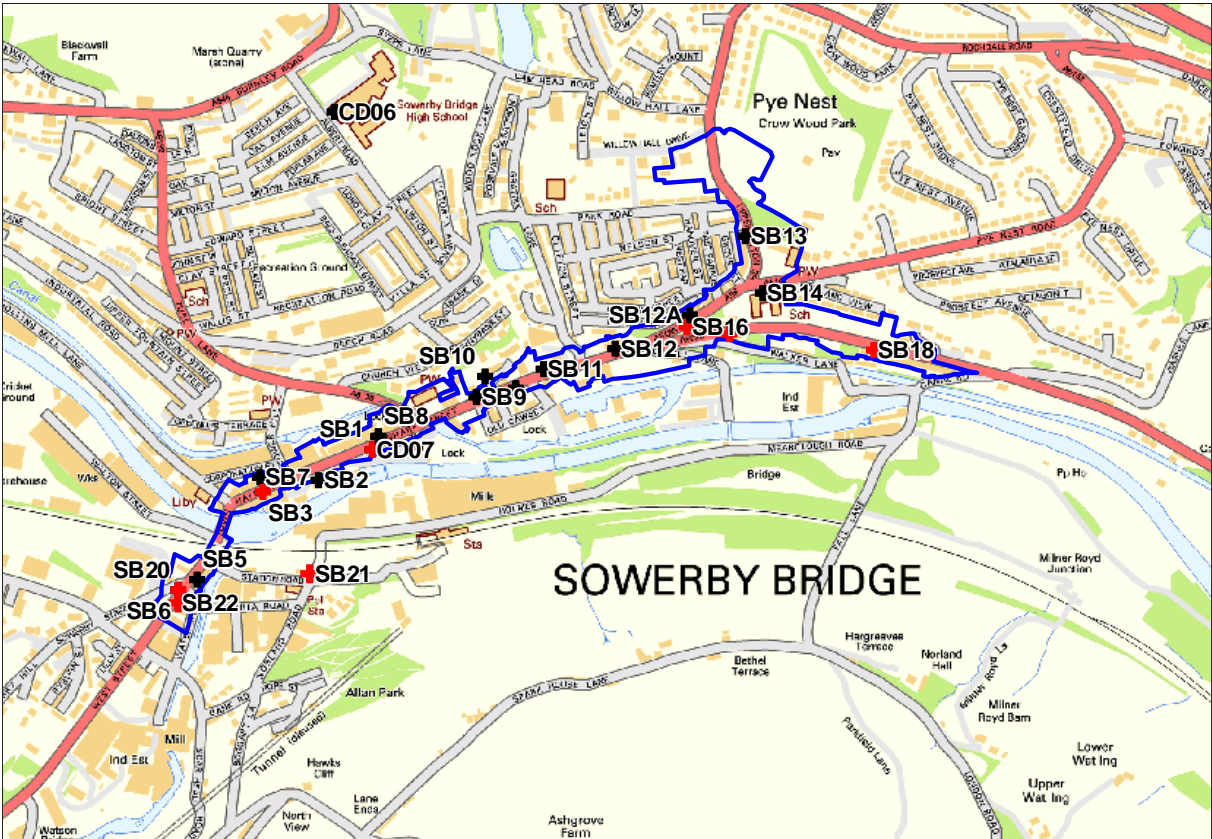


Figure 9: diffusion tubes in Sowerby Bridge (AQMA No. 2)

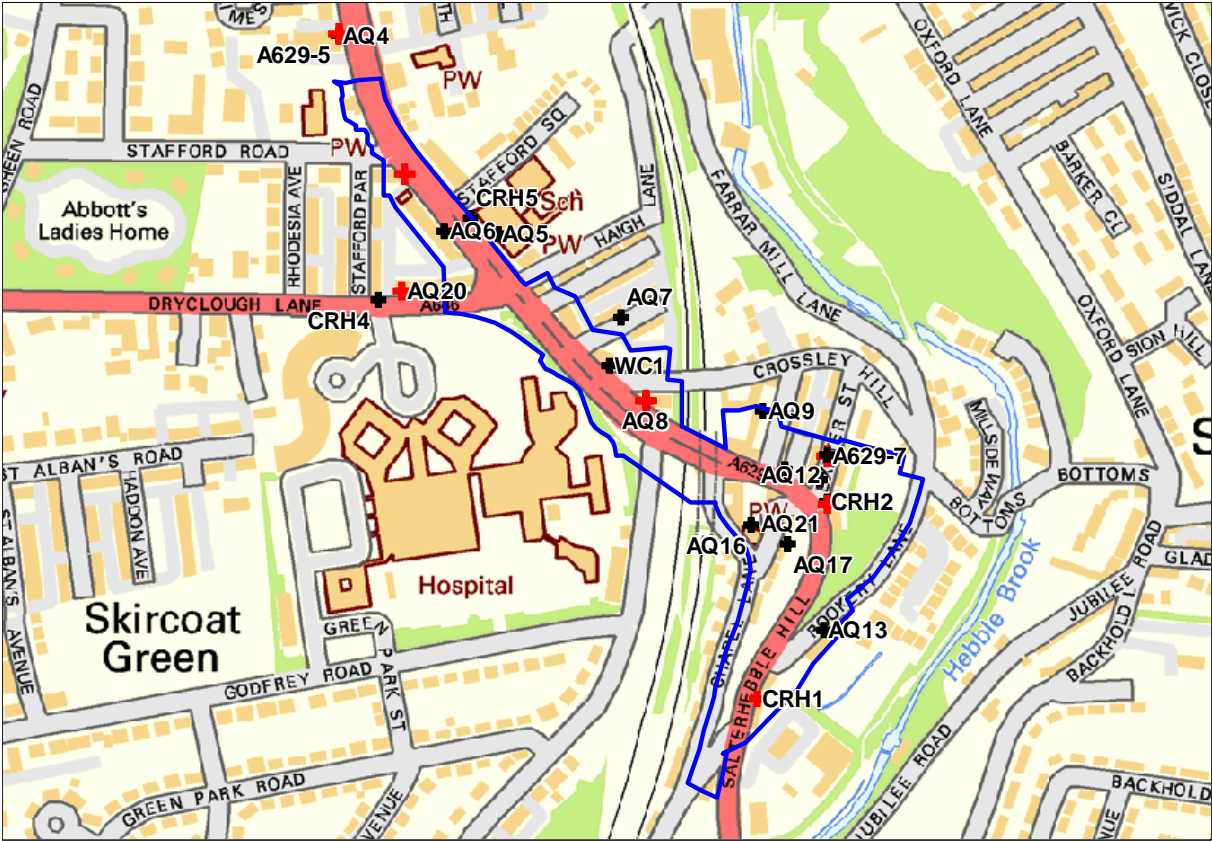


Figure 10:diffusion tubes in Salterhebble (AQMA No. 1)

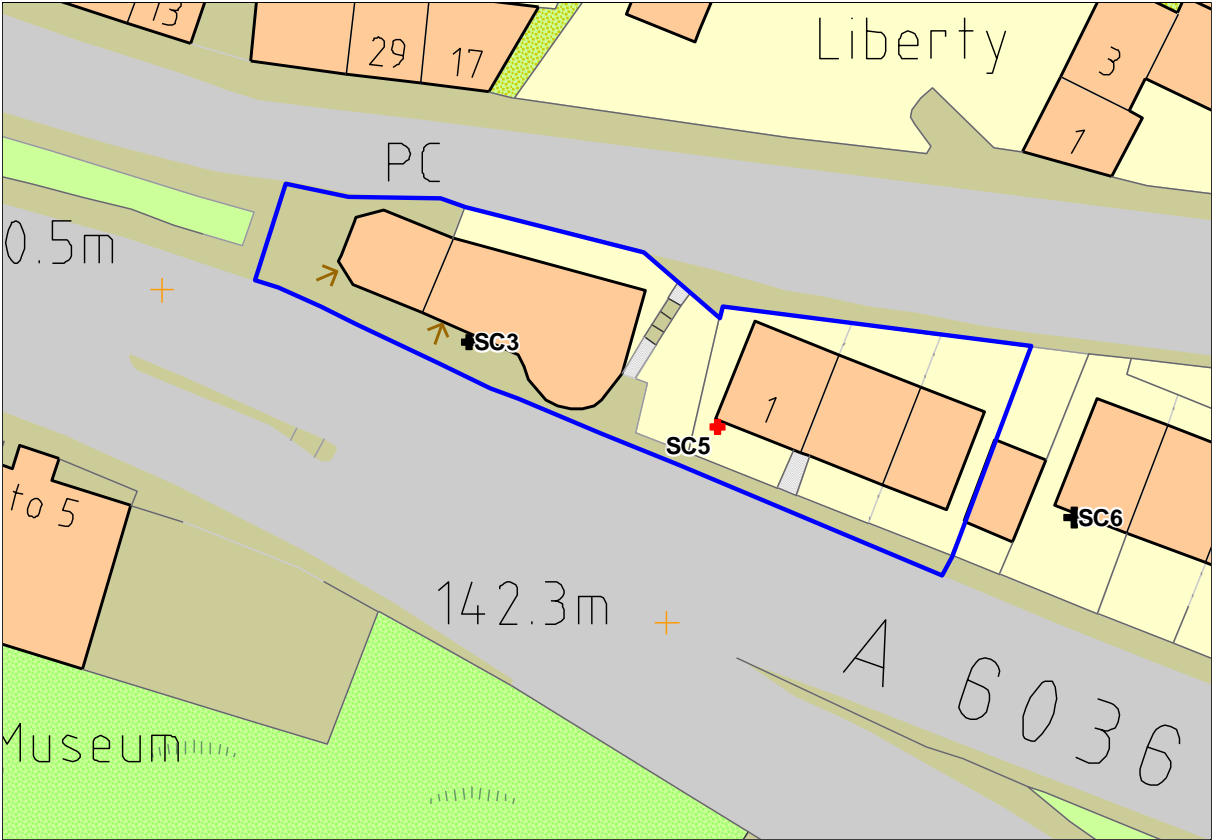


Figure 11: diffusion tube SC5 at Stump Cross (AQMA No.5)

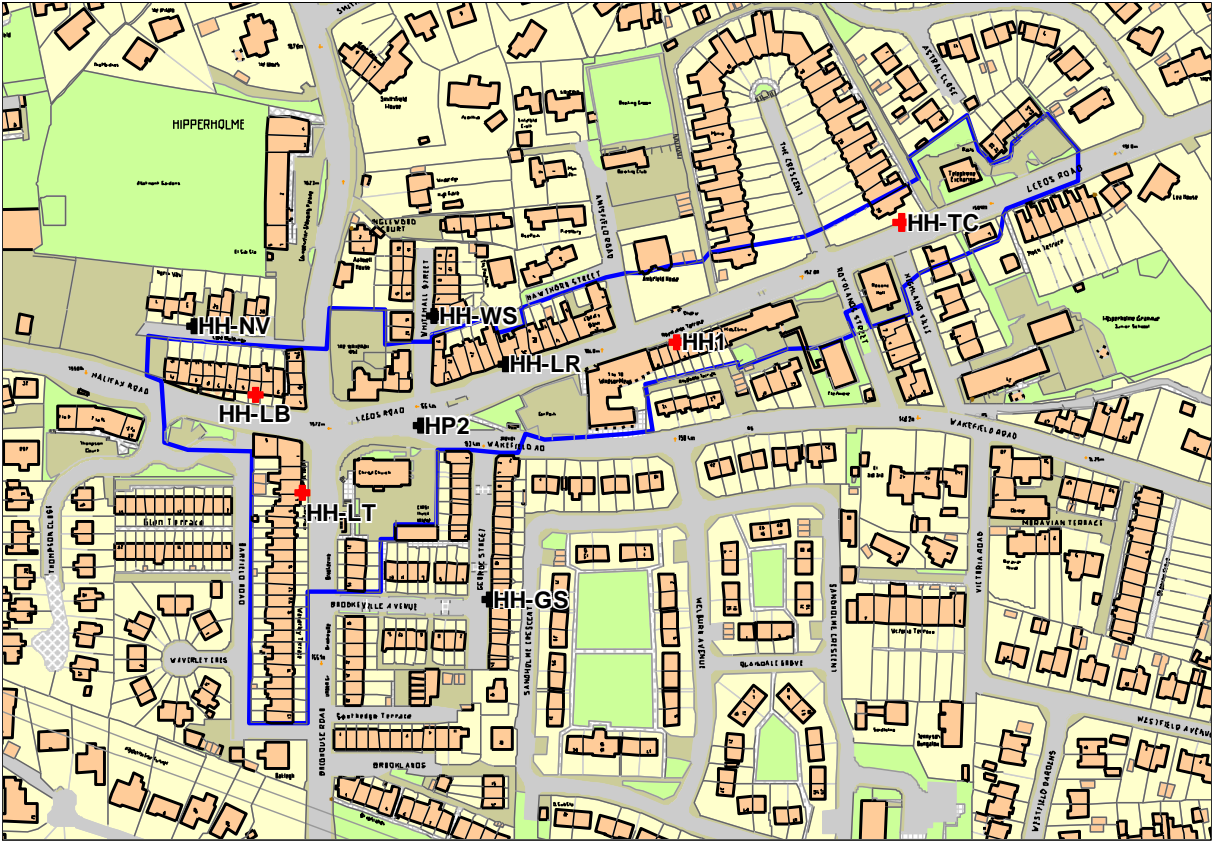


Figure 12: diffusion tubes in Hipperholme (AQMA No. 7)

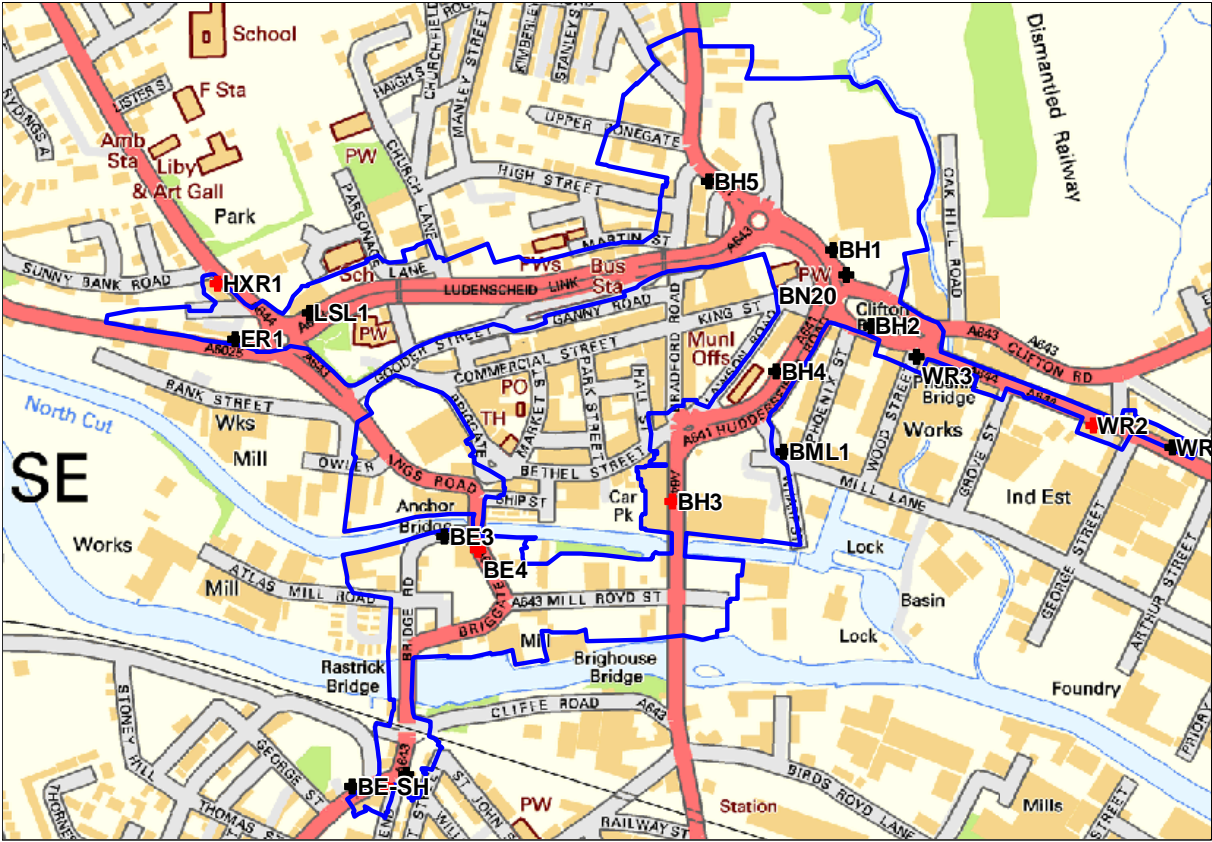


Figure 13: diffusion tubes in Brighouse (AQMA No. 6)

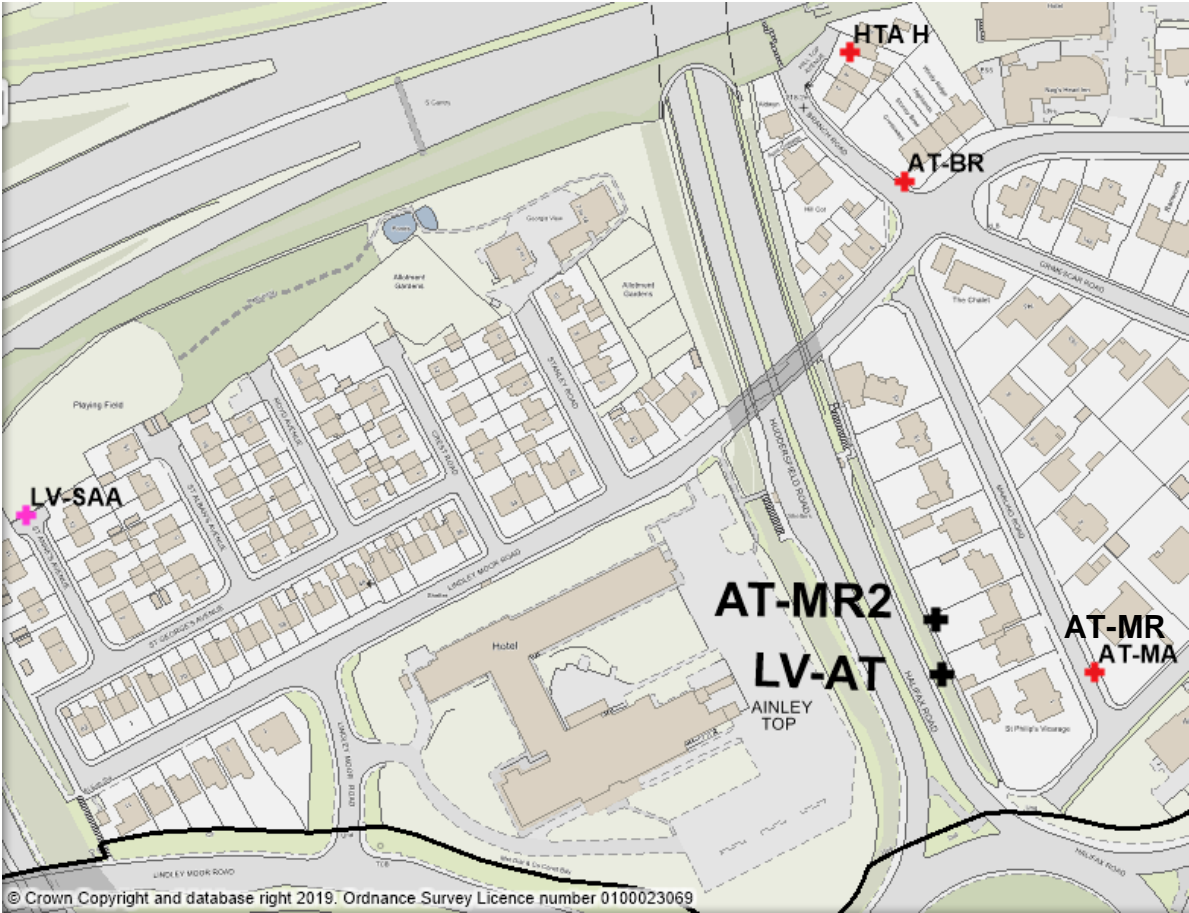


Figure 14: diffusion tubes at Ainley Top (not in an AQMA)

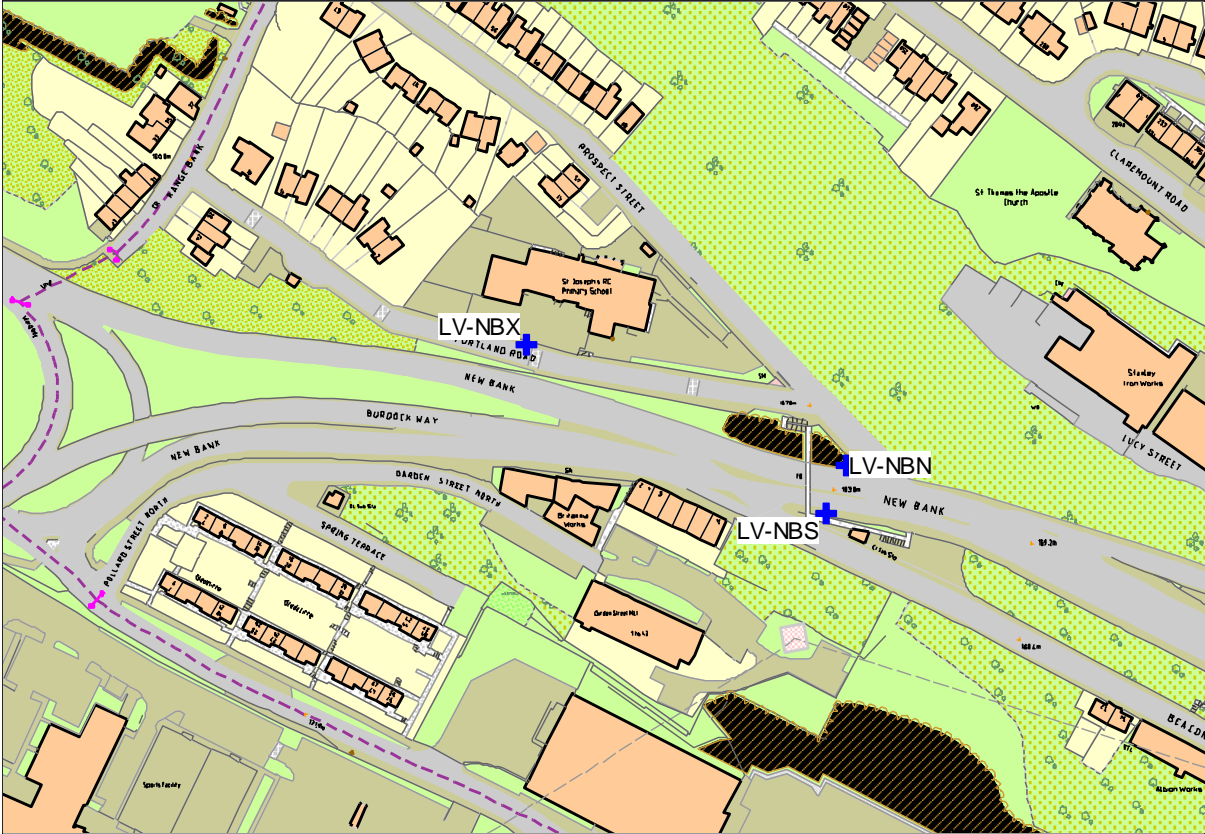


Figure 15: diffusion tubes at New Bank (not in an AQMA)

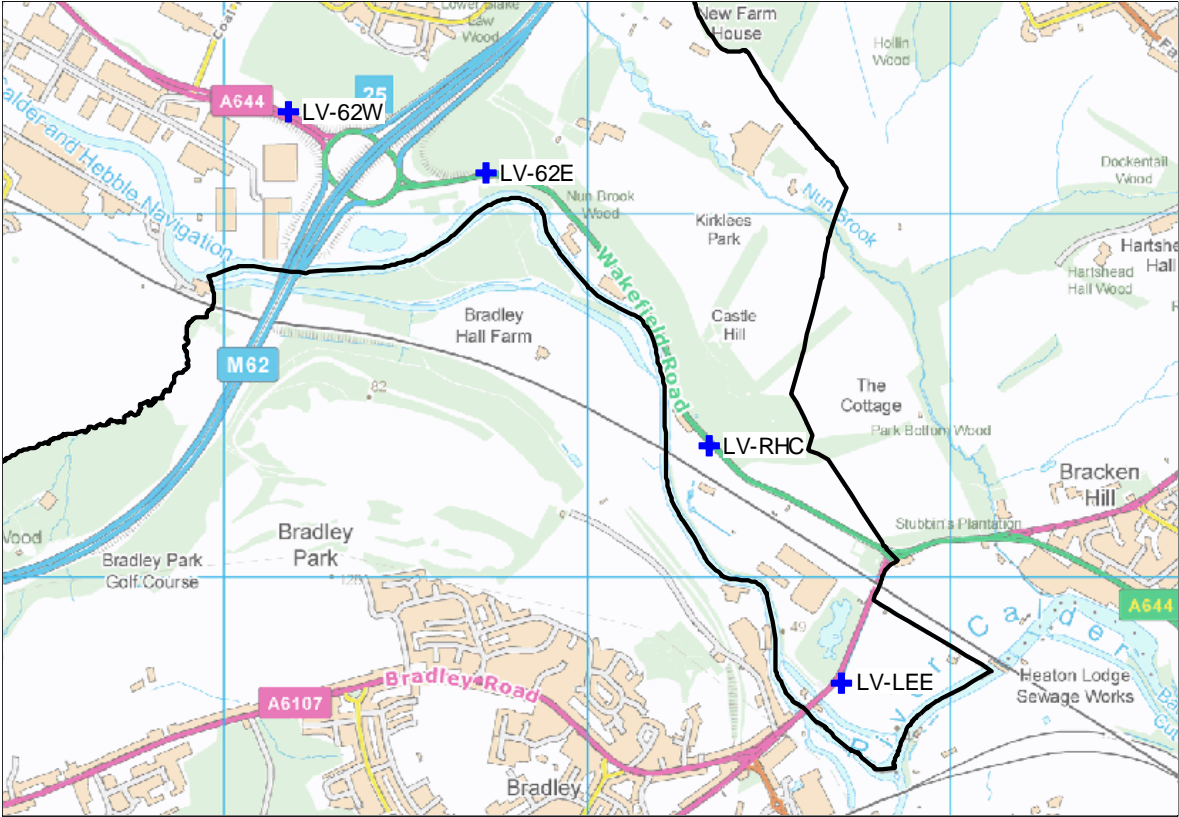


Figure 16: diffusion tubes along A644 at Brighouse (not in an AQMA)

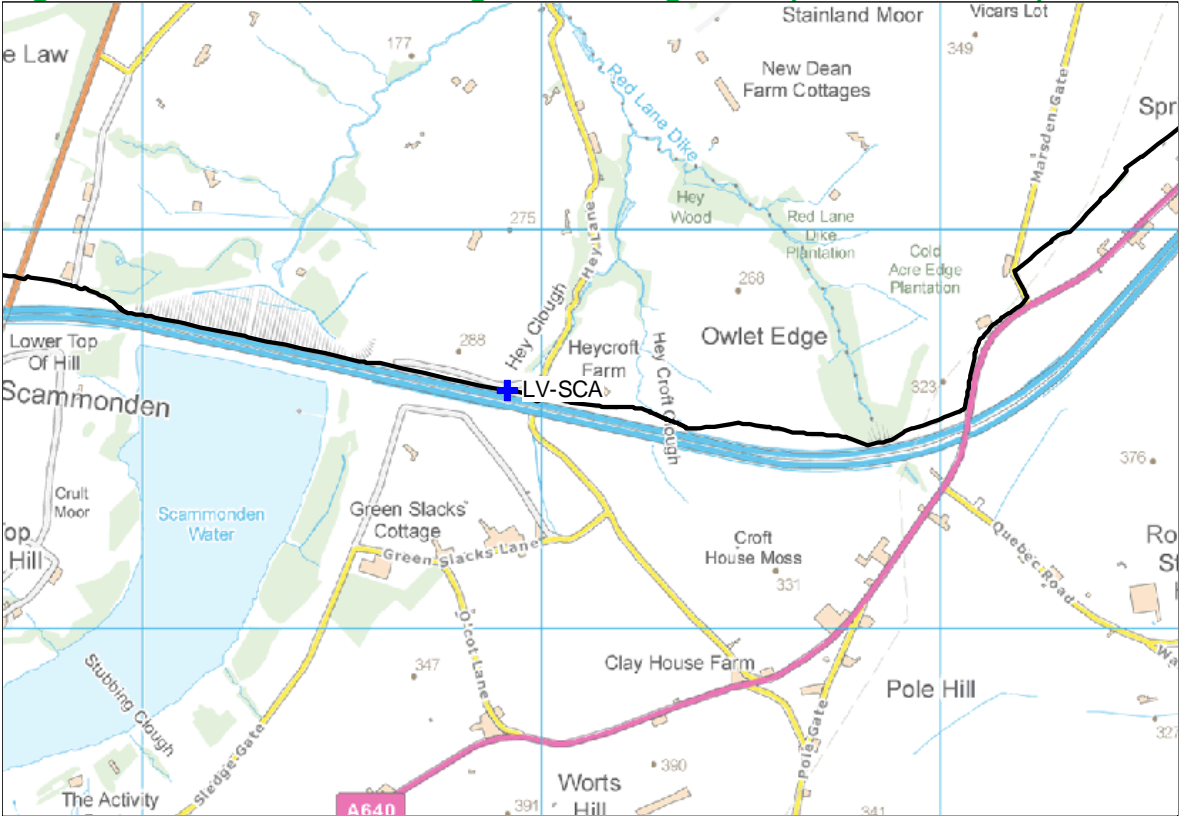


Figure 17: diffusion tube LV-SCA on M62 (not in an AQMA)



Figure 18: diffusion tube LV-EWB on A629 Elland Wood Bottom (not in AQMA)

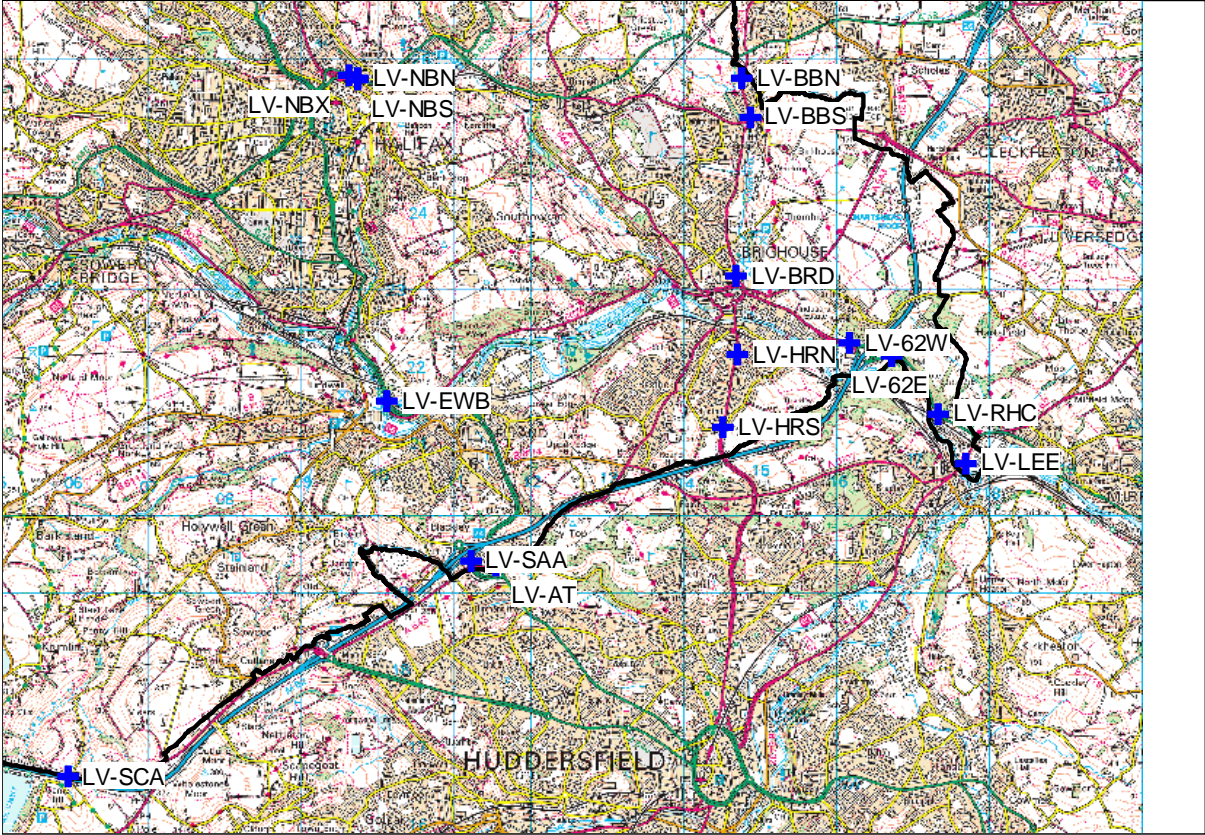


Figure 19: distribution of LV- series diffusion tubes across Calderdale

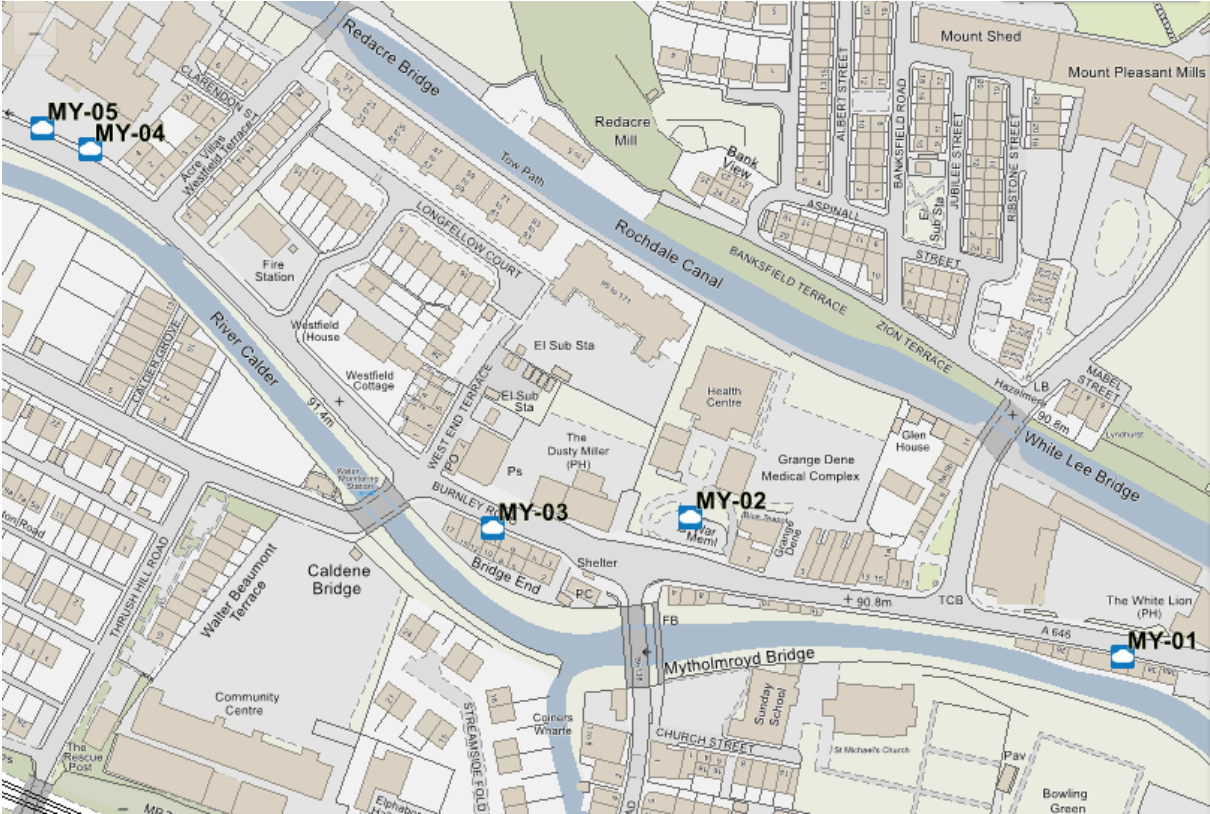


Figure 20: diffusion tubes in Mytholmroyd

Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ⁴	
	Concentration	Measured as
Nitrogen Dioxide (NO ₂)	200 µg/m ³ not to be exceeded more than 18 times a year	1-hour mean
	40 µg/m ³	Annual mean
Particulate Matter (PM ₁₀)	50 µg/m ³ , not to be exceeded more than 35 times a year	24-hour mean
	40 µg/m ³	Annual mean
Sulphur Dioxide (SO ₂)	350 µg/m ³ , not to be exceeded more than 24 times a year	1-hour mean
	125 µg/m ³ , not to be exceeded more than 3 times a year	24-hour mean
	266 µg/m ³ , not to be exceeded more than 35 times a year	15-minute mean

⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Appendix F: Governance

The table below sets out how progress with the actions in the main table 3.2 is monitored

Action	AQAP reference/ policy/ strategy	Progress to date	lead	KPI
Action Plan development				
Review air quality steering group members and agree terms of reference and format of action plan	NA	Terms of reference and action plan format to be agreed at steering group meeting 18 June 2018	Named	completed
Establish low emissions/air quality delivery group	NA	Steering group to agree the make-up of the delivery group and how the action plan should be monitored.	Steering group	
Monitoring and measurement				
Measure air quality at key sites and routes	AQAP1(1)	Ongoing - tubes and measuring sites. Also need information from major projects around monitoring of air quality. Need to investigate whether and how we make live air quality data available.	Named	Data collection
Traffic Management				
Signalling strategies to be developed and improved using Leeds UTC	AQAP1(3)	Proposal through WYTF to link all district signals to one system (UTC) and join services together in Leeds. Being developed. Not directly relevant to air quality measure.	Named	Improved traffic flows and queue lengths at key sites
Improve real time messaging to drivers using VMS. Will inform drivers of delays on network	AQAP1(3)	VMS sites displaying route messages established. A646 - 5 sites operational and introducing a further two sites at Brighouse and Rishworth A629 to have new messages added but part of WYTF proposals for Phase 4	Named	Improved traffic flows
Development of parking strategy	Parking Strategy	Assess feasibility of technology to assist strategy development eg real time parking – being tested using APPY parking technology Parking standards incorporated within the local plan.	Named	Improved traffic flows

Improve traffic flow by improving signals needed to allow for interaction with freight/van in cab technology	AQAP2(3)	Not progressed – discussed feasibility for undertaking work with third party but not considered appropriate for Calderdale.	Named	Improved traffic flows
Traffic Planning and Infrastructure				
Develop package of works to alleviate congestion. Corridor Improvement Programme -- A646 and A58/A672 corridor resilience; A629 corridor improvements	AQAP1 (all)	Sowerby Bridge outline proposal complete - outline business case only. Hebden Bridge and Luddenden Foot same stage. A629 corridor improvements are a range of active delivery projects – phase 1s now complete; phase 1b/2 at planning stage; phase 3 not progressed; phases 4 and 5 in development. CIP corridors at outlines business case – consultants appointed..	Named	Improved traffic flows
Develop NE Calderdale Transformational Project Package to alleviate congestion on A58 Hipperholme and A6036 Stump Cross		Package may include works in the wider NE Calderdale network. Only funded pre-feasibility. Complete – funding required.	Named	Improved traffic flows
Improve A641 corridor Brighouse/SE Calderdale		Being delivered as part of WY+TF – pre feasibility stage	Named	Improved traffic flows
Make A644 Cooper Bridge air quality compliant	NA	Complete – now compliant	Named	% decrease giving measured concentration of xx
Cycling strategy actions	AQAP3(2)	Upgrade of Upper Valley Towpath complete to Hebden Bridge – further work planned in phase 2 to Todmorden Hebble Trail extension plan now developed. Ryburn greenway feasibility study complete. Pre-feasibility done on N Halifax routes. Bike racks in Halifax town centre now installed	Named	Increase in cyclist numbers
Improve lighting of key cycle routes	AQAP3(2)	No funding yet identified	Named	Increase in cyclist numbers

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Incorporate air quality into planning considerations for new developments	AQAP5(3)	Part of planning regulations	Planning officer	Policies applied to all developments
Development of cycling and walking strategy and programme	AQAP3(3)	Walking and cycling infrastructure plan to be developed. LCWIP to be used in development.	Transportation	Increased numbers walking and cycling
Improve Calder Valley rail line	Transport Strategy [CMBC17]	Development of station at Elland including access and parking. Delivery expected 2022. WYCA to start work on new base plan and production schedules being developed. Developing community rail partnership to encourage more train travel.	Named	Improved transport integration
Develop strategy for total transport/mobility hubs	Transport Strategy [CMBC17]	Ongoing. Strategy and plan to be developed around integration of services in one hub. Potential for a demand responsive service and incorporation of links to signposting or apps relating to walking and cycling routes.	Named	Improved transport integration
Investigate feasibility and scope of a targeted action area	AQAP5(3)	Sowerby Bridge identified as a targeted action area – not a non-charging clean air zone as this is confusing for drivers and residents. Linked to the Masterplan and CIP scheme in 2020/21	Named	
Create 'Healthy Streets' with aim of more attractive, accessible and people friendly streets	AQAP3(3)	Health streets principles incorporated into Calderdale HDC design guide – in development. Healthy Street pilot proposal £1m in Park Ward.	Named	Policies applied to all developments
Trial Green Screen	Project	Defra funding for Green Screen at Burnley Road school – installed by May 2019. Monitoring before and after ongoing.	Transportation and Environmental Health	
Low Emission Strategy and Transport				

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Install charging facilities for taxis and for public use	AQAP5(4)	Installation of EV charging points - grant allocation from West Yorkshire. Leaders' briefing/cabinet paper done. One Uber electric taxi now available.	Named	Number of EV charging points
Procure ULEVs within Calderdale fleet where practical	AQAP4(1)	ULEV not suitable for Calderdale fleet within existing infrastructure and the fleet has been/and is being replaced by LEV euro 6 engines. ULEV is considered within the procurement process for all vehicles. One handyman van is now ULEV. Steering group needs to input on process for future procurement	Named	Reduced vehicle emissions
Promote usage of electric charging facilities	AQAP4(1)	Supplier will promote location and usage	Named	Usage of EV charging points
Promote uptake and usage of electric vehicles	AQAP5(4)	West Yorkshire Electric Vehicle strategy in development	TBC	Uptake of vehicles
Install on street electric car charging using OLEV funding of £100k	AQAP4(1)	Business improvement identifying areas using MOSAIC to help prioritise locations. Aiming to apply this financial year	Named	Usage of EV charging points
Review implementation of WYLES	AQAP5(3)	Calderdale has adopted the WYLES. A WYLES officer is to be appointed by Summer 2019 to progress WYLES strategy on behalf of the 5 WY authorities.	Named officers	
Investigate ECO stars scheme	AQAP2(3)	ECO stars already committed to and funded by WYCA. TRL appointed April 2019. Planning stages for TRL to contact companies across West Yorkshire to encourage participation in the scheme.	Named officers (TBC)	number of partners signed up
Improve bus fleet quality	AQAP3(1)	In partnership with WYCA and bus operators. First Bus have confirmed that 39 buses in Calderdale retrofitted by end May 2019. 14 buses already compliant out of total 95 first buses.	Named	Reduced vehicle emissions
Public Awareness of air quality				

Measure air quality in local communities and raise awareness of issue	Project	No suitable monitor found,	Named	Data collection and raising awareness
Develop communications campaign including engagement, web pages and social media	AQAP2(2)	. Requirements and communications being developed	Communications team	Improved awareness of air quality issues
Capitalise on national events to raise awareness	AQAP2(2)	Clean Air day is 20 June 2019 and will be promoted	Communications team/ Sheridan Paterson/Bridget Kusyj	Improved awareness of air quality issues
Promoting Travel Alternatives				
Increase car sharing and alternative transport	AQAP3(1)	Promotion of car sharing internally at CMBC ongoing. Further promotion with external companies required via workplace health. Promotion of car clubs eg Enterprise	Named	Increased numbers using sustainable modes of transport
Promote public transport as alternative to car	AQAP3(1)	Needs to be coordinated with work undertaken by WYCA/Metro. Free first bus ticket incorporated in council tax statements 2018.	TBC	Increased numbers using sustainable modes of transport
Promote LEV for taxis	AQAP4(2)	Bid to ULEV for charging facilities for low emission taxis. West Yorkshire money available for 2 charging points across the district. The supplier chosen to install will help to advertise these.	Named	Uptake of vehicles
Promote bikeability and bike library	AQAP3(2)	Programme continues and is promoted by all services	Named	Take up of schemes
Promotion of alternative transport to Calderdale staff	AQAP3(2)	Promotion of metro cards, electric bikes, discounted travel card, bike and go integrated cycle scheme continues.	Named	Take up of schemes
Develop schools active and safe travel strategy - linked to reducing obesity and road safety	AQAP3(3)	Obesity workshop up and running led by Public Health	Named	Increased numbers walking and cycling

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Park and ride expansion at rail stations	AQAP3(1)	Funded improvement schemes are being progressed at Mytholmroyd and Hebden Bridge stations	Named	Improved transport integration
Bus Partnership agreement to be established	AQAP2(3)	Bus alliance now established -	Named	Number of partners taking part
Rights of Way Improvement Plan to be updated	AQAP3(3)	Plan needs to identify ways to promote and raise awareness of the routes – no resource currently to do this	Named	Increased numbers walking and cycling
Promotion of alternative transport to school	AQAP5(2)	Safe travel SAFE (Sustainable, Active, Fun, Environmental) cup competition run in schools each year by independent travel team. Schools develop campaigns about travelling to school in healthier and safer ways.	Named	Increased numbers walking and cycling
Compatibility with other programmes				
Carbon savings and improved energy performance of homes and businesses	AQAP6(3)	Feasibility of Halifax district heat network in Halifax centre for businesses and council portfolio. An air quality impact assessment is likely to be needed.	Named	
Promote energy saving and renewable energy schemes	AQAP6(1)	Calderdale Community energy webpages established and projects undertaken with schools	Named	
Support businesses to manage energy consumption and save money	AQAP6(3)	6c working with businesses, schools and colleges	Named	
Review environmental permits for all types of units/installations	Enforcement Policy (EH)	Inspection programme is in place	Named	

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
BAM	Beta Attenuation Monitor (for measuring particulate matter)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
EU	European Union
EV	Electric Vehicle
FDMS	Filter Dynamics Measurement System
LAQM	Local Air Quality Management
LTP	Local Transport Plan
MOVA	Microprocessor Optimised Vehicle Actuation (a sensitive pad or strip in the road to inform traffic signal sequencing)
NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
PM ₁₀	Particulate matter with an aerodynamic diameter of 10µm or less
PM _{2.5}	Particulate matter with an aerodynamic diameter of 2.5µm or less
QA/QC	Quality Assurance and Quality Control
SO ₂	Sulphur Dioxide
ULEV	Ultra Low Emission Vehicle
VMS	Variable Message Sign (usually at the roadside)

WYCA	West Yorkshire Combined Authority
WYLES	West Yorkshire Low Emissions Strategy
WY+TF	West Yorkshire Plus Transport Fund

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