



**Brighton & Hove
City Council**

2017 Air Quality Annual Status Report (ASR)

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

June 2017

Brighton & Hove City Council

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Churchill Square and North Street part of Brighton & Hove's Bus Low Emission Zone

Executive Summary: Air Quality in Our Area

Air Quality in Brighton & Hove City Council

Brighton & Hove City Council's is compliant with all pollutants listed in the national Air Quality Strategy (AQS) with the exception of nitrogen dioxide (NO₂). The city first declared an Air Quality Management Area (AQMA) for NO₂ in 2004. The two current AQMAs for NO₂ were declared in 2013 and include Brighton & Hove Centre connected with South West Portslade. Rottingdean Village is a separate area. There are no plans to amend or revoke the existing AQMAs or declare new ones during the next reporting period up to the middle of 2018.

Parts of Brighton & Hove's coastal frontage and the South Downs National Park (within the Local Authority Area) have air quality that is amongst the cleanest in the South East of England. A number of parks or background sites in the city have consistently recorded low levels of airborne pollution namely; NO₂, microscopic particulate and Poly Aromatic Hydrocarbons (PAH). In contrast at roadside places where diesel traffic stops and starts in confined spaces concentration of NO₂ continue to exceed the national limit. Throughout the year high levels of NO₂ are monitored at residences and workplaces and where pedestrian activity is frequent adjacent to A, B and C roads. Typically these busy transport corridors have high density of permanent dwellings with thousands of passing people; active cyclists and walkers. This is important when considering the dose and exposure to pollutants inhaled and lifelong impacts on overall health and lung condition.

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 especially affects the most vulnerable in society: children and older people, and those with heart and lung conditions. Airborne pollution can add to the health burden of smoking and is an extra risk to those with sedentary lifestyles. The local impact on health and wellbeing is summarised in our Joint Strategic Needs Assessment¹ There is often a strong correlation with equalities issues, because

¹ Brighton & Hove City Council Joint Strategic Needs Assessment found at:
<http://www.bhconnected.org.uk/sites/bhconnected/files/6.4.9%20Air%20Quality%20JSNA%202016.pdf>

areas with poor air quality are also often the less affluent areas^{2,3}. That said parts of Central Brighton in the Air Quality Management Area (AQMA) have expensive property prices and very high rental rates. Affluent people live on polluted streets. Measures to improve air quality will benefit all of society.

The annual health cost to society of the impacts of particulate matter alone in the UK is estimated to be around £16 billion⁴.

The Environment, Transport and Sustainability Committee approved the Cities' latest Air Quality Action Plan (AQAP) in October 2015. This followed twelve week public consultation earlier that year. Further information can be found in the Brighton & Hove 2015 AQAP found online⁵.

In the two years since considerable progress has been made with the AQAP. Delivery and updates are summarised in this Air Quality Annual Status Report (ASR). The Council is working closely with bus and taxi operators, the Low Carbon Vehicle Partnership (LCVP) and the Joint Air Quality Unit (JAQU) that is made up of government departments for the Environment and Transport. There is cross border discussion with adjacent local authorities. The City Council is active member of the Sussex Air Quality Partnership (SAQP). Environmental Protection at the Council has chosen to monitor Particulate Matter less than 2.5 microns (PM_{2.5}). The City Council is close to meeting both national exposure reduction objectives (2020) and World Health Organisation guidelines for this pollutant.

Defra (Department for the Environment Food and Rural Affairs) together with PHE (Public Health England) have published a briefing on air quality⁶ (March 2017). The reports sets out examples of how local authorities can use the Public Health Outcomes Indicator to specify appropriate mitigation measures to reduce the impact of both short term and long term exposure of air pollution. We plan to use this document in 2017/18 and consider how it can be used to inform our action across departments.

² Environmental equity, air quality, socioeconomic status and respiratory health, 2010

³ Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

⁴ Defra. Abatement cost guidance for valuing changes in air quality, May 2013

⁵ Brighton & Hove 2015 Air Quality Action Plan found at: <http://www.brighton-hove.gov.uk/content/environment/air-quality-and-pollution/air-quality-management-city>

⁶ Air Quality: A Briefing for Directors of Public Health March 2017 A Local Government Publication Defra and Public Health England found at: <http://www.adph.org.uk/2017/03/air-quality-a-briefing-for-directors-of-public-health/>

Priority Areas for Air Quality Improvement

A series of pictures below helps explain the situation in Brighton & Hove's two extant AQMAs. It is important to note that the national model predictions of air quality preclude B and C roads which make up a significant proportion of both local AQMAs. Whilst some exceedances of the NO₂ standards are monitored on the approach to junctions, this is not exclusively the case. Higher NO₂ levels are recorded along transport corridors. In many parts of the AQMA this can be a hundred or more metres from the main junctions.



London Road and Lower Cheapside (above photograph) has some of the highest levels of nitrogen dioxide in Sussex. The area is characterised by emission contributions from mixed traffic; buses, trucks, taxis, vans and cars. The area has busy markets with high pedestrian footfall and continued exceedance of the hourly standard for NO₂. Low or no emission buses and taxis are an essential requirement for the area. London Road fits all the criteria for a Low Emission Area or a Clean Air Zone.



The Brighton & Hove Bus Low Emission Zone (LEZ) includes North Street Churchill Square and Western Road, for much of its length the B2066 is only open to buses and taxis. The road link is one of the busiest highways in the UK for buses. Bus services between the City Centre the Universities of Brighton and Sussex operate day and night. Retail, residential, hotel, restaurant and entertainment uses surround the street that has very high pedestrian numbers. Buses on the uphill carriageway (towards this view point) dominate emissions of oxides of nitrogen within the street canyon. Bus counts have been monitored at one hundred an hour approaching three thousand daily. The corridor was designated as a Low Emission Zone January 2015. In 2016 Diffusion tube and automatic analysers (at four sites) continue to record exceeding levels of NO₂ adjacent to North Street and Castle Square. Two monitors suggest continued exceedance of the hourly average for a small area. Monitoring suggests an improving trend (at a faster rate than elsewhere). The NO₂ annual standard (> 40 µg/m³) is exceeded on Western Road with all air quality standards likely to be met as far west as Brunswick Square.



Grand Parade has A23 general traffic close to residential façade. Levels are likely to continue to exceed the NO₂ annual mean for some years to come without intervention measures. Smoother traffic flow will help ease emissions associated with vehicle launch and engine idling. There are plans to improve the Valley Gardens park area. A tree and shrub planting programme has been discussed with landscaping and Highways. It is advised that outdoor events use plugged in places instead of diesel generators.



Brighton & Hove City Council

New England Road (picture above) is an important east-west link under the London to Brighton railway. High frequency and duration of queuing cars and vans happen adjacent to the residential facade. A queue length of 400 metres west of Preston Circus tends to happen much of the day. Engines idle in the eastbound queue whilst vehicles accelerate up the hill (westbound) passing by terraces houses one metre from the Old Shoreham Road Hill section. Whilst monitoring suggests recent NO₂ improvement concentrations of: 50µ/m³ have been typical over the past decade. It is important that new developments do not add additional traffic to New England Road. Network management should explore alternative routings or consider a Clean Air Zone for cars and vans. Anti-idling “cut engine cut pollution” signs and information re the timing of red light phase change would suit this area.



The main station is an important transport interchange with pick up points for buses and taxis. There have been a number of recent complaints in the area relating to diesel fumes and engine idling. NO₂ levels of: 45µ/m³ is typical for Queens Road over the past decade. An improvement to the flow of buses and taxis is required for Queens Road. Some have called for an extension of the “bus and taxi only zone” that exists for North Street and Churchill Square. Such a move would need a caveat that requires accelerated delivery of Ultra Low Emission buses and taxis.



Bus and cycling use are well established on the Lewes Road between the universities and the City Centre. NO₂ hotspots continue adjacent to Lewes Road on approach roads to the main junctions; along Coombe Terrace, south of the Vogue Gyratory and are near to Elm Grove (pictured above). There are discussions regarding further emissions improvements for regular buses shuttling along the corridor day and night. It is advised that new development minimise impacts on NO₂ in this area aiming for neutral or beneficial change to the existing situation.

Hollingdean Road is a “C road link” that carries more than 16,000 vehicles a day and has high duration of queuing traffic with engine idling adjacent to housing. The road section does not have any scheduled bus services. NO₂ levels have been close to: 45µ/m³ for a decade. Hollingdean Road has been part of the AQMA since 2004. The road link provides access to the Cities waste transfer and material recycling facility. It is important that Council and Veolia waste vehicles fleets set out how they will work towards Ultra-Low Emission Fleets.

Road traffic emissions are the reason for an exceedance of NO₂ standard opposite the Sussex Royal County Hospital. The ten years construction project at the hospital is likely to influence local emissions and roadside air quality along Eastern Road. The Construction Environment Management Plan conditions that Heavy Goods Vehicles will meet the more stringent Euro-VI emission standard.



The haulage route from Shoreham Port passes into Brighton & Hove City Council's area along Wellington Road and Trafalgar Road to Southern Cross in South Portslade. The Council's Environmental Protection team would like to have further talks with Harbours Authority regarding the schedules for Heavy Goods Vehicles (HGV) to meet the Euro-VI emissions standard.



Funding has been allocated for a modest traffic scheme to alleviate emission in the Rottingdean High Street bottleneck and AQMA. One suggestion is for an extension of existing keep clear zones to around twenty metres long. This would help avoid diesel traffic emission happening in the narrowest part of the street.

Actions to Improve Air Quality

Brighton & Hove has one of the few UK bus Low Emissions Zones outside of London. The LEZ targets emission improvement for the highest mileage buses. Infrequent trips into the zone are exempted. Local bus operators continue to invest in a cleaner bus fleet. Environmental Protection has managed a series of projects supported by the Department for Transport's (DfT's) Clean Bus Transport Fund (CBTF). Working with *Eminox*, seventy-three double decker exhaust retrofits have been completed. On average the retrofits reduce oxide of nitrogen (NOx) emissions by around 70%. Some of the fitted vehicles have NOx rates equivalent to the Euro-VI emission standard. At the same time a project working with *Green Urban Technologies* using DfT's Clean Vehicle Transport Fund (CVTF) has retrofitted taxi minibuses and cars with cleaner exhaust systems. It has been a challenge to access working vehicles to fit the Selective Catalytic Reduction (SCR). It is recommended that future funds to improve air quality support procurement of new Ultra Low Emissions Vehicles (ULEV).

The Big Lemon bus company is on track to convert at least two regularly operating buses to electric operation. Lithium-ion *magtec* batteries are to be charged from the operators array of solar panels⁷. Use of electromotive charging points for cars and vans whilst still a small part of the total, has increased exponentially since 2012. The recent growth can be appreciated by the statistic: The UK has 0.9% of the world's population (65 million out of >7 billion) and 5% of the world's electric vehicles (100,000 out of two million).

The rapid on street vehicle charger at Withdean (takes a few minutes) is one of the most used in the South East. The charging facility is operated by *charge your car network*⁸. Development opportunities are being sort to install a higher percentage of parking spaces with wiring ready for future electromotive; cars, vans, taxis, scooters and electrically assisted bicycles.

⁷ Big Lemon Electric found at: <https://thebiglemon.com/>

⁸ Withdean Stadium Electric Charging Point found at: <https://www.zap-map.com/pts/neqhzd1/>

After bidding to DfT's access fund for sustainable travel, Brighton & Hove has won £1.45 million to unlock growth with active travel initiatives⁹. The cities bike share scheme goes live summer 2017. The service will be available in and around the main Air Quality Management Area (AQMA).

Conclusions and Priorities

Exceedances of NO₂ continue at roadside near to general traffic, buses and taxis. 2016 regional and background levels showed a slight increase in NO₂ levels compared to 2015. That said where intervention measures to reduce NO₂ were focused concentrations continue to improve. Good progress has been made since peak NO₂ levels were recorded in 2010.

Moving forward 2017/18 actions for air quality:

- A review of the Brighton bus Low Emission Zone (LEZ) considering what options might be effective to further work towards localised NO₂ compliance - discussion on how a modified LEZ or CAZ might help deliver this goal
- Continue to promote active and sustainable travel, including the Access Fund projects financed from 2017-2020
- Reach agreement with JAQU regarding final allocation of remaining Clean Bus Transport Funds to work towards much lower vehicle emission of NO_x
- Finalise the Clean Vehicle Transport Fund (CVTF) project including track testing to be shared with the Low Carbon Vehicle Partnership
- Seek assistance for accelerated rollout of Ultra-Low Emissions Vehicles (ULEV) that include electric and hybrid options
- Liaise with Highways regarding changes for traffic flow in Rottingdean High Street following funding allocation
- Air Quality Action plan seeks options for energy storage on developments and for transport avoiding fixed plant combustion with oxide of nitrogen emissions to air in the urban area

⁹ Access Fund for Sustainable found at: Travel <https://www.brighton-hove.gov.uk/content/parking-and-travel/travel-transport-and-road-safety/access-fund-sustainable-travel-brighton>

- Resume talks with the Harbours Authority to discuss their schedule to procure a higher percentage of Euro-VI trucks for port haulage
- Brighton & Hove have asked members of the Sussex Air Quality Partnership to consider funding of a joint venture across a number of Sussex Local Authorities for an anti-idling campaign including an educational and awareness project working with volunteers and schools
- Explore options for grid balancing and hydrogen storage as a policy for City Development Areas (DA) and local transport fleets
- There are no plans to revoke the existing AQMAs during the next year. The action plan summary table (included in this Annual Status Report) provide updates on progress since the 2015 AQAP
- Review how we can use Public Health England and Defra briefing and forthcoming NICE (National Institute for Health and Care Excellence) and COMEAP (Committee on the Medical Effects of Air Pollutants) guidance on outdoor air pollution and health
- Brighton & Hove Environmental Protection, Health, Transport have provided joint comments to Defra's consultation on improving nitrogen dioxide in our town and cities. This includes participation at workshops in London, feedback on national technical reports including proposals for Clean Air Zones (CAZ) a related report has been delivered to Brighton & Hove's Environment Transport & Sustainability Committee

Local Engagement and How to get Involved

Brighton and Hove is compact and high density; many local journeys are less than 5km. The healthiest option for short journeys is active travel; walking, jogging, roller skating and cycling including electrically assisted bicycles. Supported by Transport and Public Health, The City Council's Access Fund for Sustainable Travel is funded until 2020 by the Department for Transport, it will be promoting the health benefits of active travel.

These projects aim to ensure that sustainable transport is the preferred way to ensure that residents, visitors, employees and students are able to access the seafront area for employment and leisure.

The project will support the rollout of the 'Brighton Bike Share' project due to launch in late summer 2017. This is a Local Growth Funded project. Our Access fund project will help to promote and encourage the expansion of the scheme over the timescale of the fund.

Our measures, which will be delivered up to March 2020, are based on programmes successfully delivered over the last ten years. There is an emphasis on programmes to boost the number of people cycling and walking, and also a stronger focus on improving access to jobs, skills, education and training. Projects will be delivered under the following themes: Access to Work; Personalised Travel Planning; Access to Education; Encouraging Cycling; and Road Safety.

To further progress the AQAP Environmental Protection has proposed an anti-engine idling campaign that will involve the local community, engage volunteers, schools and workplaces. During 2016 the City Council received numerous complaints for engine idling. Modern cars stay hot for twenty-five minutes after being switched off. Engine idling draws in extra air that cools engine and exhaust systems producing higher emissions. Idling for more than a few minutes contributes to pollution in one place.

The best travel choices for urban air quality are to avoid older diesel vehicles for short journeys. Economic driving achieves lower fuel consumption and avoids harmful emission from the tailpipe. Smooth drive styles reduce particulate release due to tire wear and harder braking releases fine metals to the urban environment. Local car share and car club options are available¹⁰. Smart ticket multi-mode trips information can be found: via *Journey Planner*¹¹. The universities and hospital trusts (with campus in or adjacent to the AQMA) are important partners in action to promote healthy low emission travel options. No emission vehicles can complement active travel for a cleaner healthier city more conducive to business investment and leisure.

¹⁰ Local Lift Share Options found at: <https://liftshare.com/uk/journeys/from/brighton>

¹¹ Journey Planner found at: <http://www.brighton-hove.gov.uk/journeyplanner/>

Endorsement from the acting Director of Public Health, Brighton & Hove City Council

Brighton & Hove is committed to working with partners to ensure that the City will be a place where improved health and wellbeing is experienced by all. Poor air quality has negative impact on public health, with potentially serious consequences for individuals, families and the population as a whole. Identifying problem areas and ensuring that actions are taken to improve air quality forms an important element in protecting the health and wellbeing of Brighton & Hove residents. Improving air quality is often a complex issue, presenting a multi-agency challenge – so it is essential that various departments especially; Environmental Health, Transport, Planning and Public Health work together effectively to deliver improvements where they are needed. As Acting Director of Public Health I endorse this Annual Status Report which sets out the position in Brighton & Hove and which will support an ongoing work programme to address air quality issues.

Acting Director of Public Health
Peter Wilkinson

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1 Local Air Quality Management

This report provides an overview of air quality in Brighton & Hove City Council during 2016. 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 Brighton & Hove City 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.

2 Actions to Improve Air Quality

2.1 Air Quality Management Areas

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

A summary of AQMAs declared by Brighton & Hove City Council can be found in Table 2.1. Further information related to declared or revoked AQMAs, including maps of AQMA boundaries are available online¹². Alternatively, see Appendix D: Map(s) of Monitoring Locations , which provides for a view of air quality monitoring locations in relation to the AQMA(s). It is not anticipated that the City Council will revoke or amend its existing AQMAs over the course of the next reporting year and has no plans to declare any new AQMAs.

¹² Brighton & Hove AQMA found online at: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=35

Table 2.1 – Declared Air Quality Management Areas

AQMA Name	Date of Declaration	Pollutants and Air Quality Objectives	City / Town	One Line Description	Is air quality in the AQMA influenced by roads controlled by Highways England?	Level of Exceedance (maximum monitored/modelled concentration at a location of relevant exposure)		Action Plan (inc. date of publication)
						At Declaration	Now	
AQMA Brighton Hove and Portslade	Aug-13	NO ₂ Annual Mean	Brighton Hove & South Portslade	>240 hectares includes a few thousand roadside dwellings	NO	83 µg/m ³ (highest level monitored at façade)	60 µg/m ³	Brighton & Hove City Council 2015 Air Quality Action Plan Annual Status Report Progress Updates
AQMA Brighton Hove and Portslade	Aug-13	NO ₂ 1 Hour Mean	Brighton Hove & South Portslade	North Street and London Road	NO	114 µg/m ³ (measured with diffusion tube, high pedestrian footfall on pavement and likely exceedance of hourly average)	100 µg/m ³	Brighton & Hove City Council 2015 Air Quality Action Plan Annual Status Report Progress Updates
AQMA Rottingdean	Aug-13	NO ₂ Annual Mean	Rottingdean	Less than one hectare Rottingdean High Street including junction with A259 and Vicarage Lane about fifty dwellings	NO	46 µg/m ³	39 µg/m ³	Brighton & Hove City Council 2015 Air Quality Action Plan with Annual Status Report Progress Updates

Brighton & Hove City Council confirm the information on UK-Air regarding their AQMA(s) is up to date

2.2 Progress and Impact of Measures to address Air Quality in Brighton & Hove City Council

Defra's appraisal of last year's ASR concluded that maps of monitoring locations should be included. Detailed maps with annotated 2016 results are presented in Appendix D of this report.

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

The original position and the consultation behind it can be found in the 2015 AQAP. The AQAP is not set in stone following consultation and committee approval and is an evolving document. For example bus technology for low emission is a fast moving topic with changes happening at a rapid rate. Key completed measures are:

- Exhaust retrofit of 73 double decker buses now all in operation
- Conditioning of euro-VI heavy good vehicles on the Royal Sussex County Hospital rebuild
- Field enforcement response to engine idling and diesel fumes

Brighton & Hove City Council is exploring the following measures to be considered over the course of the next reporting year:

- Further work towards localised NO₂ compliance discussion and how a modified LEZ or CAZ might help deliver this goal
- Continue to promote active and sustainable travel, including the Access Fund projects financed from 2017-2020
- Reach agreement with JAQU regarding final allocation of remaining Clean Bus Transport Funds to work towards much lower vehicle bus NOx
- Finalise the Clean Vehicle Transport Fund (CVTF) project including track testing to be shared with the Low Carbon Vehicle Partnership
- Seek funds for accelerated rollout of Ultra-Low Emissions Vehicles (ULEV) that include electric and hybrid options and opportunities for taxi licencing

- Work with Highways regarding proposed changes for traffic flow in Rottingdean High Street following funding allocation
- Air Quality Action Plan hierarchy for energy on developments avoiding fixed plant combustion with preference for renewable without emissions to air
- Explore options for grid balancing and hydrogen storage with merits considered for City Development Areas (DA) and local transport fleets
- Resume talks with the Harbours Authority to discuss their schedule to procure Euro-VI emission vehicles
- Brighton & Hove have asked members of the Sussex Air Quality Partnership to consider funding of a joint venture across a number of Local Authorities for an anti-idling campaign including an educational and awareness project working with volunteers and schools
- There are no plans to revoke the existing AQMAs during the next year. The action plan summary table (included in this Annual Status Report) provide updates on progress since the 2015 AQAP
- Review how we can use PHE/Defra Public Health briefing and forthcoming NICE guidance on outdoor air pollution and health
- Brighton & Hove Environmental Protection, Health, Transport have provided joint comments to Defra's consultation on improving nitrogen dioxide in our town and cities. This includes participation at workshops in London, feedback on national technical reports including proposals for Clean Air Zones (CAZ)
- A review of the Brighton Bus Low Emission Zone (LEZ) considering what options might be effective to further work towards localised NO₂ compliance - discussion on how a modified LEZ or CAZ might help deliver this key goal
- Reach agreement with JAQU related to revised allocation of remaining Clean Bus Transport Funds to work towards much lower vehicle emission of NO_x
- Finalise the Clean Vehicle Transport Fund project including track emission testing to be shared with the Low Carbon Vehicle Partnership
- Seek assistance for accelerated rollout of Ultra-Low Emissions Vehicles that include electric and hybrid options.

The principal challenges and barriers to implementation that Brighton & Hove City Council's anticipates are:

1. Awaiting the final UK Air Quality Plan and thereby enable local plans, policies and strategies to be reviewed and implemented to address the detail of this final UK Plan.
2. Annual changes in central and local government funding streams and grant and bid allocations makes financial and strategic planning a challenge. Particularly with the uncertainty in relation to the impact of BREXIT.
3. Working in a field where technology is new and innovative and sometimes needs testing to assess viability and at the same time delivering in accordance with procurement and financial regulations and standing orders.

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

1. Adaptation of vehicles to test and fit new technology such as exhaust retrofits relies on commercial businesses withdrawing vehicles from service and therefore interrupting income generation.
2. Working with new and innovative technology does bring with it uncertainty around implementation timetables and challenges when scaling up and down to different vehicle and fleet sizes

Whilst the measures stated in Table 2.2 will help to contribute towards compliance, Brighton & Hove City Council anticipates that further additional measures not yet prescribed including continued behavioural changes will be required in subsequent years to achieve compliance and enable the revocation of the City Centre and Portslade AQMA and the Rottingdean AQMA.

Table 2.2 – Progress on Measures to Improve Air Quality

Measure No.	Measure	EU Category	EU Classification	Organisations involved and Funding Source	Planning Phase	Implementation Phase	Key Performance Indicator	Reduction in Pollutant / Emission from Measure	Progress to Date	Estimated / Actual Completion Date	Comments / Barriers to implementation
1	Conversion of Diesel Buses to Electric Lithium-Ion batteries	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	Environmental Protection (EP) and DfT Clean Bus Transport Fund (CBTF) and the Big Lemon Bus Company	2016	2017	NOx emission reduction	100% reduction in NOx emissions	Funding secured, two buses being converted	31/03/2018	Approval by Defra to use CBTF for electric conversion took more than two months
2	Procurement of Euro-VI buses with micro-engines and regenerative braking Hybrid Electrical Vehicle	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	Brighton & Hove Bus Company	2015	2017 & 2018	NOx emission reduction on very high mileage vehicles plying trade through the AQMA	Estimated 50%-95% reduction in NOx emissions	36 new buses May 2017 more 2018	2018	N/A
3	BUS LEZ	Promoting Low Emission Transport	Low Emission Zone (LEZ)	Unitary Authority Highways liaising with several bus operators Traffic Regulation Order	2013	2014	NOx emission reduction on very high mileage vehicles plying trade through the AQMA	Compliance with Euro-V Emissions Standard through the LEZ	50 double deckers fitted	Delivered Jan-2015	Bus Operators given grace period to comply with Euro-V. Advised to advance to Euro-VI or electric asap.
4	Exhaust Fit of Diesel Buses First Project	Promoting Low Emission Transport	Low Emission Zone (LEZ)	EP and DfT Clean Bus Transport Fund Brighton & Hove Bus Company	2013	2014	NOx emission reduction on very high mileage vehicles plying trade through the AQMA	80% reduction in NOx emissions	Further 23 double deckers fitted	Delivered Jan-2014	N/A
5	Exhaust Fit of Diesel Buses Second Project	Promoting Low Emission Transport	Low Emission Zone (LEZ)	EP and DfT Clean Bus Transport Fund Brighton & Hove Bus Company	2015	2016	NOx emission reduction on very high mileage vehicles plying trade through	90% reduction in NOx emissions	Further 23 double deckers fitted	Delivered Jan-2017	N/A

Brighton & Hove City Council

							the AQMA				
6	Diesel Electric Hybrid	Vehicle Fleet Efficiency	Public Vehicle Procurement - Prioritising uptake of low emission vehicles	Unitary Authority Highways and Brighton & Hove Buses	2013	2013	Fuel Saving and general emission reduction	20% Fuel Saving	13 diesel electric hybrid double decker buses	Delivered 2013	N/A
7	Exhaust Fit of Taxi Minibus and Saloons	Promoting Low Emission Transport	Taxi emission incentives	EP and DfT Clean Vehicle Transport Fund Citycabs and Radiocabs Low Carbon Vehicle Partnership	2014	2016/17	NOx emission reduction on very high mileage vehicles plying trade through the AQMA	80% reduction in NOx emissions	Fitted 16/22 taxis (minibuses and cars). Track test at Millbrook.	mid-2017	Access to working vehicles to carry our SCRT design and fits very challenging delaying completion
8	Routing of HGV assigned to construction of Royal Sussex County Hospital	Freight and Delivery Management	Route Management Plans/ Strategic routing strategy for HGV's	Highways Planning, EP and Lang O'Rouke	2016	2017-2026	Construction Environment Management Plan (CEMP) Traffic to minimise movements in AQMA	Reduce congestion and emissions impacts in and around the AQMA	Starts with Construction Project	2017/2018	Waiting on Consolidation Centre
9	Emission standard for HGV working on Royal County Hospital	Promoting Low Emission Transport	Company Vehicle Procurement - Prioritising uptake of low emission vehicles	Highways, Planning and EP Lang O'Rouke	2016	2017-2026	HGV working on construction to comply with Euro-VI emission standard	Compliance with Euro-VI Emissions Standard	Starts with ten year Construction Project	2017/2018	Action on Lang O'Rouke to procure new HGV
10	Anti-Idling Signs at Taxi Ranks and Bumper Stickers	Traffic Management	Anti-idling enforcement	EP and Taxi Licence Forum	2014	2015-2017	Stickers and Anti-Idling Signs	Anti-Idling Signs at Taxi Ranks and on Vehicles	Citywide	Delivered	Good example of working between EP and Taxi Licencing
11	Taxi Licencing to work towards lower emission vehicles	Promoting Low Emission Transport	Taxi Licencing conditions	EP Taxi Licence Forum Seeking Joint Venture Across the Sussex Air Group	2017	2018	Work towards licencing of no emissions taxis across more than one local authority	Aim for 100% reduction in NOx emissions	Preliminary	2017/2018	Business as Usual a Barrier to Improvement

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12	Educational Anti-Idling Campaign	Traffic Management	Anti-idling enforcement	EP, Enforcement Officers, Sussex Air Group, Cool World Consulting	2017	2018	Volunteer and Educational Engagement	Increased Awareness and Anti-Idling Sings at NO2 hotspots with queing traffic	Support from Cllrs	2018	Seeking Financial Support from Sussex Air
13	Light Phasing at Junctions to reduce que duration in the AQMA	Traffic Management	UTC, Congestion management, traffic reduction	EP, Traffic Control	2017	2018	Explore where queing duration can be reduced in the AQMA	Residential Façade Monitors on junction approaches	Initial meeting Proposed	2018	AQ input required on planned Highway projects
14	Valley Gardens Transport Scheme	Transport Planning and Infrastructure	Other	Highways and EP Coast to Capital LEP	2017	2019	A23 Carriageway to be moved away from the residential façade improved pedestrian access to park and landscape	Modelled benefit for 3/4 of monitors in the area	Technical Workshops and Secured Funding	2019	Finalise Plans and Seek Approval
15	Active Travel Programme	Promoting Travel Alternatives	Intensive active travel campaign & infrastructure	Transport and Health Joint Working Group and Access Fund Board	2017	2017	Increase active travel to work and education	More healthy workers reduced emissions due to % of active travel	Funding Secured	2017	Officer Allocated
16	Bike Share	Transport Planning and Infrastructure	Public cycle hire scheme	Transport	2017	2017	Increase in cycling	Uptake to be monitored	Scheme Starting Summer 2017	2017	Sponser agreement took time
17	Rapid Vehicle Charging SE Network	Promoting Low Emission Transport	Procuring alternative Refuelling infrastructure to promote Low Emission Vehicles, EV recharging, Gas fuel recharging	Sussex Air Group and Office of Low Emission Vehicles	2015	2015	High use of local electromotive rapid chargers	Electric Vehicles have zero NOx emission	Implemented	Delivered at Withdean	Required OLEV funding to start network

18	Actively seek renewable solutions and grid balancing avoid combustion plant in or above the AQMA	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	EP and Planning Policy, Development Control	2016	Ongoing	Electricity grid balancing seek alternatives to combustion	100% reduction in NOx emissions or avoidance of new emissions	Discussion with Planning Policy and Major Development Areas	Ongoing	Business as Usual unlikely to deliver future improvement
19	Any new combustion in the AQMA condition as ultra-low NOx	Promoting Low Emission Plant	Emission control equipment for small and medium sized stationary combustion sources / replacement of combustion sources	EP and Planning Policy, Development Control	2015	Ongoing	No permissions for low or moderate NOx plant in the AQMA	70% reduction in NOx emissions or avoidance of new emissions	Conditions on Planning Applications	Constant	Standard Practice tends to be applied regardless of position relative to the AQMA
20	Flue determinations above roof apex required for emissions to air to insure effective dispersion	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	EP and Planning Policy, Development Control	2015	Ongoing	Flue or Chimney heights agreed with planning or refused	Dispersion of emissions above the building canopy needs to be effective	Included in the Planning Process	Constant	Chimney Heights can be refused for visual or architectural considerations
21	Avoid introducing new residential to an existing area of NO ₂ exceedance	Policy Guidance and Development Control	Air Quality Planning and Policy Guidance	EP and Planning Policy, Development Control	2007	Ongoing	Number of Dwellings in Area of Exceedance	Exposure Avoidance	Planning Conditions and Mitigation	Constant	Pressure to Build including at Roadside
22	Pamphlet Burning Solid Fuels Safely and Legally	Public Information	Via leaflets	EP and Defra funded project	2012	2013	Pamphlet delivered via Chimney Sweeps	More efficient domestic fires	Improved Awareness	Delivered	

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23	In the AQMA avoidance of fires as a refuse disposal method by trade	Public Information	Via the Internet	EP and AQ Action Plan, complaints and engagement with local building trade	2012	2013	Advice given when complaints received	Appropriate waste disposal for City Centre	Improved Awareness	Constant	Lack of awareness of the AQMA and health sensitivities
24	Progress Emission Standard of Haulage serving the Harbour	Freight and Delivery Management	Other	EP with Harbours Authority grants considered	2016	Ongoing	Emissions Standard of Haulage through Portslade	Increased Percentage of Euro-VI	Initial Dialogue	2020	Better engagement from the Harbours Authority fleet can be national as well as local
25	Consider Impact of Pedestrian Crossing Points on Traffic Flow	Traffic Management	Other	EP Liaising with Traffic Control Transport Schemes and Road Safety	2015	2018	Better flow of traffic, some avoidance of crossings that stop traffic	Avoidance of NOx emissions on vehicle launch from a standing start	Discussed at technical workshops road & safety consultation	2018	
26	Freight Consolidation Centres 3km out to avoid heavy movements in the AQMA	Freight and Delivery Management	Freight Consolidation Centre	LTP4	2015	Unknown	Reduction in heavy Haulage movements in the AQMA	Sunstantail reduction in NOx from freight	LTP short list	2017/2018	Local Transport Plan requires funding to progress
27	Taxi Rank Site Choice - to have regard to ambient air quality and sensitive residential	Promoting Travel Alternatives	Other	Hackney Carriage and EP	2015	Ongoing	New taxi ranks at locations unlikely to cause complaint or contribute to NO ₂ at residential	Taxis to provide transport alternative	Discussion with Planning	2018	Limited space for taxi ranks away from dwellings
28	Alter position of traffic emissions in Rottingdean High Street	Transport Planning and Infrastructure	Other	Highways, EP and Local Parish Council	2017	2018	Achieve 35 µg/m ³ at all monitors in the Rottingdean AQMA	Avoid traffic emissions to the narrowest section of the High Street	Discussion re chicanes and keep clear zones Funding approved	2018	£40,000 funding

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

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

For this reason in recent years Brighton & Hove City Council has chosen to monitor PM_{2.5}. To complement the AURN monitoring station in Preston Park the Council monitors for PM_{2.5} at two roadside sites BH6 on Lewes Road and BH10 on North Street.

Sussex Air alert mostly refers to regional fine particulate and ozone air pollution episodes. Via multi-media those that sign up are sent air alerts informing them of a period of higher air pollution. Using Defra project funds the Council previously produced a public facing pamphlet burning solid fuels safely and legally. Many of the measures set out in the Council AQAP for NO₂ will also help particulate levels that are close to meeting WHO guidelines across the city including at roadside. That said there is no safe level and any improvement will help improve public health outcomes.

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

3.1 Summary of Monitoring Undertaken

In 2016 the City Council continued to monitor in the same background and roadside sites as in 2015. There were minor additions to the set of nitrogen dioxide diffusion tubes. For example two sample sites on Boundary Road, Portslade tested the possibility of an AQMA revocation in that area. Further monitoring data is required to determine if that might be possible. Improvement in long term NO₂ concentrations across all of Hove and Portslade will be required if the AQMA is to be revoked across a wider area. Remaining hotspots in the western part of Brighton & Hove City Council include the north end of Sackville Road, Wellington Road and Trafalgar Road, Preston Road and The Drove

3.1.1 Automatic Monitoring Sites

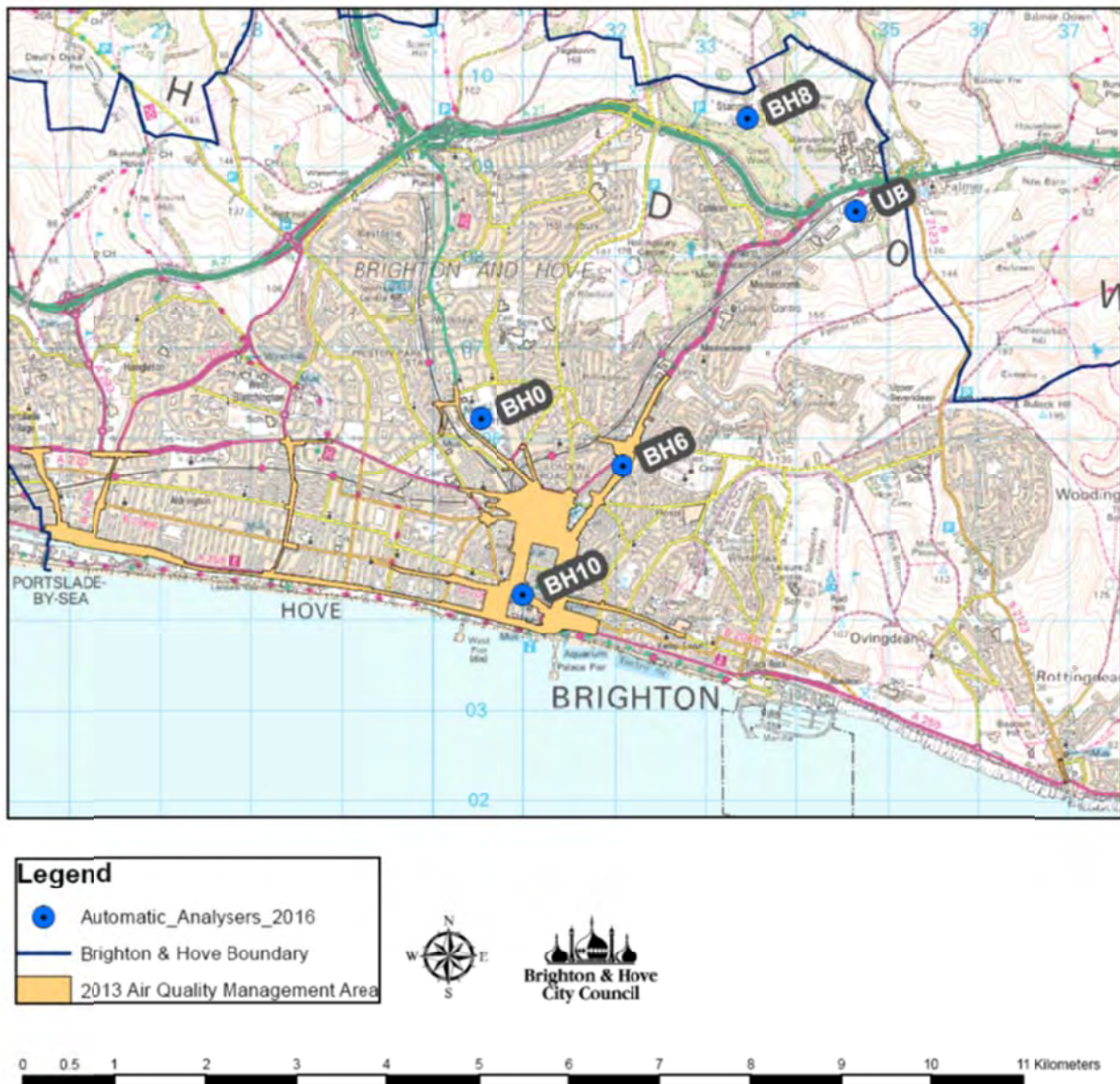
This section sets out what monitoring has taken place and how it compares with objectives.

Brighton & Hove City Council undertook automatic monitoring at three sites (including ozone) during 2016. Table A.1 in Appendix A shows the details of the sites. National monitoring results for the AURN (Automatic Urban Rural Network) are available on line¹³. The University of Brighton has a background air monitor on its campus, detailed results are not been available at the time of writing.

Maps of archive monitoring sites are shown in past LAQM reports. Figure 1 below shows the location of automatic air monitoring sites that were active in 2016 within Brighton & Hove City Council area.

¹³ Preston Park AURN results found at: <https://uk-air.defra.gov.uk/networks/network-info?view=aurn>

Figure 1 2016 Active Automatic Analysers Brighton & Hove



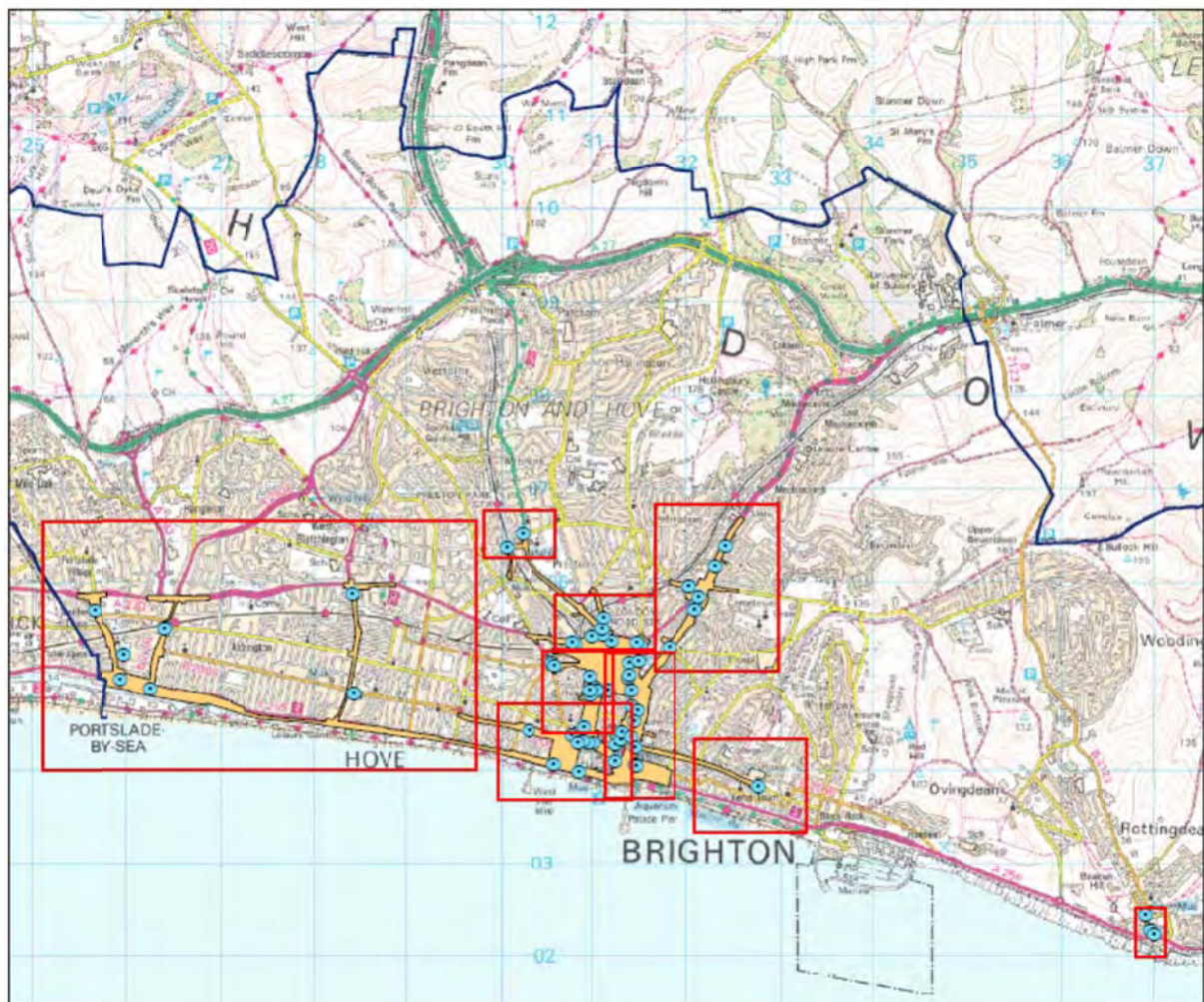
Further details on how the monitors are calibrated and how the data has been adjusted are included in Appendix C.

3.1.2 Non-Automatic Monitoring Sites

Brighton & Hove City Council undertook non- automatic (passive) monitoring of NO₂ at sixty-five sites during 2016. Table A.2 in Appendix A shows the details of each area. More detailed maps for each sub area are presented in Appendix D.

An overview of NO₂ diffusion tubes within Brighton & Hove City Council area is mapped in Figure 2.

Figure 2 2016 Active Nitrogen Dioxide Diffusion Tubes Brighton & Hove



Legend

- Diffusion Tubes 2016
- Brighton & Hove Boundary
- 2013 Air Quality Management Area



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Further details on Quality Assurance/Quality Control (QA/QC) for the diffusion tubes, including bias adjustments and any other adjustments applied are included in Appendix C.

3.2 Individual Pollutants

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

3.2.1 Nitrogen Dioxide (NO₂)

Table A.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. In 2016 NO₂ was monitored at three automatic sites; two at roadside and the AURN site located in a large suburban park. All sites include regular filter changes and calibrations in accordance with LAQM TG16.

For diffusion tubes, the full 2016 dataset of monthly mean values is provided in Appendix B. Results are reported for just over sixty-nine tubes at sixty-five sites. All tubes have been adjusted so representative of exposure in accordance with LAQM TG16.

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

Exceedance of the annual mean greater than 60µg/m³, indicates that an exceedance of the 1-hour mean standard continues for two areas of the city that is: North Street and London Road.

3.2.2 Particulate Matter (PM₁₀)

Archive monitoring of PM₁₀ is set out in past LAQM reports including the 2016 Annual Status Report. In recent years the highest annual average for PM₁₀ was 27 µg/m³. As no exceedances of PM₁₀ were recorded the City Council has chosen to target resource at monitoring PM_{2.5} instead. The pollutant is especially important to health and guides the Public Health Outcomes Framework.

3.2.3 Particulate Matter (PM_{2.5})

Error! Reference source not found. in Appendix A presents the ratified and adjusted monitored PM_{2.5} annual mean concentrations for the past 5 years.

Levels recorded at the Preston Park AURN site show an improvement over the past five years and are close to compliance with WHO guidelines. Levels on North Street are slightly higher than suburban background.

3.2.4 Sulphur Dioxide (SO₂)

Brighton and Hove does not have an AQMA for SO₂. Council archives and more recent university monitors show concentrations are not recorded close to any of the standards for SO₂ set out in the national air quality strategy.

Table A.6 in Appendix A compares the ratified continuous monitored SO₂ concentrations for year 2016 with the air quality objectives for SO₂. The monitoring data has been ratified by *Environment Technology Ltd.*

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)
BH6	Lewes Road South of Vogue Gyratory	Roadside	532082	105694	NO ₂ , PM _{2.5}	YES	API Chemiluminescent, TEOM	1	1.5	3
BH10	North Street near Ship Street	Roadside	530995	104271	NO ₂ , PM _{2.5}	YES	API Chemiluminescent	0	6	3.5
BH0	Preston Park AURN	Suburban Background	530526	106218	NO ₂ , PM _{2.5} , O ₃	NO	API Chemiluminescent, Partisol	N/A	200	5
BH8	Stanmer	Rural	533457	109526	O ₃	NO	API Chemiluminescent	N/A	>200	3.5
LH	Lullington Health AURN	Rural in Wealden	553800	101600	NO ₂ , O ₃ , PM ₁₀ , SO ₂	NO	API Chemiluminescent	N/A	N/A	3
UB	University of Brighton	Suburban Background	534653	108503	NO ₂ , PM ₁ , PM _{2.5} , PM ₁₀ , SO ₂ , nitrous acid, formaldehyde	NO	Differential Optical Absorption Spectroscopy	N/A	200	3.5

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)
C03	St James Street	Roadside	531439	104045	NO2	YES	0	3.8	NO	2.7
C3-2015	St James Street Lamp	Kerbside	531448	104034	NO2	YES	2.5	3	NO	2.8
C04	Lower North Street-Castle Square	Roadside	531228	104088	NO2	YES	0	5.7	NO	2.7
C05-2012	Pavilion Gardens Background BG	Urban Background	531230	104260	NO2	NO	>100	102	NO	2.8
C08	Brighton Pavilion Lower	Roadside	531292	104321	NO2	YES	0	18.2	NO	2.4
C09	Marlborough Place	Roadside	531302	104392	NO2	YES	0	4.3	NO	3.2
C10-2012	North Street BH10 Triplicate	Roadside	530995	104271	NO2	YES	0	6.1	YES	2.5
C11	North Street Central	Roadside	530947	104284	NO2	YES	0	6.5	NO	3
C11-2012	North Street Clock Tower	Kerbside	530890	104302	NO2	YES	0	2.7	NO	2.5
C12	Queens Street north of Clock	Roadside	530900	104451	NO2	YES	0	4.2	NO	3
C12-2013	Main Station Taxi Rank	Roadside	531014	104302	NO2	YES	0	2.8	NO	2.5
C13-2014	Lower Dyke Road-	Roadside	530770	104363	NO2	YES	0	3.3	NO	3.1

	Churchill Square									
C14	West Street south of Clock Tower	Roadside	530833	104276	NO2	YES	0	4.8	NO	2.8
C15	Gloucester Place re-instated 2014	Roadside	531401	104669	NO2	YES	0	8.4	NO	3
C16	York Place	Roadside	531400	104844	NO2	YES	0	4.9	NO	2.8
C17-2012	Cheapside nr Pelham Street	Roadside	531364	104982	NO2	YES	0	3.4	NO	2.4
C18-2014	London Road near Oxford	Kerbside	531376	105012	NO2	YES	0	3	NO	2.8
C18	Oxford Street-London Road	Roadside	531376	105012	NO2	YES	0	3.3	NO	2.5
C19	Oxford Street-Ditchling Road	Roadside	531472	105161	NO2	YES	0	3.4	NO	2.6
C20	Ditchling Road-Viaduct Terrace	Roadside	531496	105315	NO2	YES	0	4.7	NO	2.2
C21	Viaduct Terrace	Roadside	531451	105356	NO2	YES	0	3.6	NO	3.1
C23	London Road-Preston Circus	Roadside	531189	105375	NO2	YES	0	5.4	NO	3
C24	New England Road-Preston Circus	Roadside	531101	105443	NO2	YES	0	3.6	NO	3
C25	New England Road-Argyle	Roadside	530985	105419	NO2	YES	0	3.5	NO	2.7

	Road									
C27	Trafalgar Street	Roadside	531151	104850	NO2	YES	0	2.8	NO	2.5
C28	Frederick Place	Roadside	531032	104843	NO2	YES	0	2.8	NO	2.4
C29	Kingsway Facade	Roadside	530848	103970	NO2	YES	0	4.2	NO	2
E01	Preston Road- Preston Circus	Roadside	531090	105510	NO2	YES	0	4.5	NO	2.8
E02	Preston Road- Preston Drove	Roadside	530233	106515	NO2	YES	0	4	NO	2.7
E02-2012	The Drove	Roadside	530233	103369	NO2	YES	0	2.6	NO	2.5
E06	Beaconsfield Road- Preston Circus	Roadside	531102	105615	NO2	YES	0	4	NO	2.6
E07-2012	Lewes Road Elm Grove Junction	Roadside	531805	105303	NO2	YES	0	2.9	NO	2.8
E08	Lewes Road- Inverness Road	Roadside	532090	105752	NO2	YES	0	4.4	NO	2.6
E10	Vogue Gyratory Island	Roadside	532126	105838	NO2	YES	0	3	NO	2.7
E12	Hollingdean Road	Roadside	532021	105946	NO2	YES	0	4.9	NO	2.7
E14	Lewes Road Lectern Pub	Roadside	532409	106370	NO2	YES	0	3.4	NO	2.9
E15-2012	Lewes Road Coombe Terrace	Roadside	532300	106159	NO2	YES	0	3.7	NO	2.6

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E16	Grand Parade Middle	Roadside	531396	104344	NO2	YES	0	4.4	NO	2.6
E16-2015	37 Grand Parade Middle West Façade	Roadside	531429	104514	NO2	YES	0	5	NO	3.2
E17	Grand Parade University Building	Roadside	531402	104365	NO2	YES	0	3.2	NO	2.8
E17-2015	174 Edward Street North Facing Façade	Roadside	531440	104225	NO2	YES	0	2.9	NO	2.7
E18	Eastern Road opposite Hospital	Roadside	532759	103810	NO2	YES	0	3.5	NO	2.9
E21	High Street-Vicarage La, Rottingdean	Roadside	536914	102446	NO2	YES	0	2.7	NO	2.6
E22	High Street Rottingdean East Side	Roadside	536968	102274	NO2	YES	0	3.1	NO	2.6
E23	High Street Rottingdean West Side	Roadside	536966	102273	NO2	YES	0	2.6	NO	2.6
E24	Marine Drive, Rottingdean	Roadside	537003	102237	NO2	YES	0	2.5	NO	2.8
BH6 Triplicate	South of Vogue Gyratory	Kerbside	532082	105694	NO2	YES	3	1.5	YES	2.5
W01	Queens Road	Roadside	530969	104785	NO2	YES	0	4.5	NO	2.8
W02	Surrey Street	Roadside	530963	104837	NO2	YES	0	5.3	NO	2.6

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W03	Terminus Road Hill	Roadside	530963	104994	NO2	YES	0	3.5	NO	3
W04	Chatham Place-New England Road	Roadside	530809	105362	NO2	YES	0	3.4	NO	3
W05	Old Shoreham Road- Hill	Roadside	530776	105400	NO2	YES	0	3.6	NO	3.2
W07-2014	Dyke Road-Seven Dials	Kerbside	530554	105142	NO2	YES	2	3	NO	3
W08	Buckingham Place-Seven Dials	Roadside	530586	105104	NO2	YES	0	8.4	NO	3.5
W10	Western Road	Roadside	530302	104415	NO2	YES	0	4.5	NO	3.2
W12-12	Church Road Hove	Roadside	528423	104809	NO2	YES	0	4	NO	2.7
W15-15	Boundary Road - Railway Inn	Roadside	526413	105517	NO2	YES	0	2	NO	3.2
W15-16	Boundary Road Shops	Roadside	526404	105500	NO2	YES	0	4.5	NO	3
W16	Wellington Road-Basin Road	Roadside	526248	104857	NO2	YES	0	3.4	NO	2.7
W17	Wellington Road-Church Road	Roadside	525931	104961	NO2	YES	0	3	NO	2.7
W18	Vale Park, Portslade BG	Urban Background	525970	105230	NO2	NO	~50	97	NO	2.8
W19	Trafalgar Road, Portslade facade	Roadside	525657	105696	NO2	YES	0	3.9	NO	2.8
W21	Sackville Road-Old	Roadside	528406	105874	NO2	YES	0	3.4	NO	2.8

	Shoreham Rd									
W22	Kingsway the Grand Hotel	Roadside	530578	104046	NO2	YES	5	3	NO	2.8

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 2016 (%) ⁽²⁾	NO ₂ Annual Mean Concentration (µg/m ³) ⁽³⁾				
					2012	2013	2014	2015	2016
BH6	Roadside	Automatic	N/A	99.8	50	48.4	48.7	39	46.2
BH10	Roadside	Automatic	N/A	98.9	63	59.7	56.4	52.5	47.1
BH0	Park Background	Automatic	N/A	89	16	16.7	16	14.8	16.5
LL1	Rural	Automatic	N/A	96.3	9	8.5	6.4	7	7.8
C03	Roadside	Diffusion Tubes (DT)	N/A	89.9	42.0	39.9	36.3	33	35.3
C3-2015	Kerbside	DT Continued	N/A	80.5				37.3	40.2
C04	Roadside		N/A	97.5	53.1	58.1	59	50.1	49
C05-2012	Urban Background		N/A	66.2	25.4	26.1	22.6	22.5	26.1
C08	Roadside		N/A	97.5	41.1	34.6	32.7	29.4	32.4
C09	Roadside		N/A	97.5	57.6	60.2	58.7	47.3	48.4
C10-2012	Roadside		N/A	97.5	61.6	65.5	53.6	52.5	48.3
C11	Roadside		N/A	97.5	83.0	84.6	68.3	59.8	60.3
C11-2012	Kerbside		N/A	97.5	114.3	114.8	121.5	91.9	100.3
C12	Roadside		N/A	97.5	55.5	49.7	52.3	42.1	45.9
C12-2013	Roadside		N/A	97.5		48.8	52.5	39.2	44.7
C13-2014	Roadside		N/A	87.9			53.2	41.7	41.5
C14	Roadside		N/A	84.1			35.3	33.6	37.7
C15	Roadside		N/A	97.5			45.7	43.1	44.3
C16	Roadside		N/A	90.4	55.0	49.3	48.3	43.8	45.1
C17-2012	Roadside		N/A	88.2	62.9	56.9	64.2	61.3	58.3

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C18-2014	Kerbside	DT Continued	N/A	88.0			<u>76.4</u>	<u>75.7</u>	<u>72.2</u>
C18	Roadside		N/A	71.0	<u>65.0</u>	<u>68.6</u>	<u>62.1</u>	<u>60.2</u>	<u>64.3</u>
C19	Roadside		N/A	97.5	<u>53.3</u>	<u>54.6</u>	<u>49.2</u>	<u>43.2</u>	<u>43.8</u>
C20	Roadside		N/A	97.5	<u>45.5</u>	<u>45.7</u>	<u>47.5</u>	39.7	<u>41.3</u>
C21	Roadside		N/A	97.5	<u>62.4</u>	<u>57.9</u>	<u>62.7</u>	<u>54.6</u>	<u>52.2</u>
C23	Roadside		N/A	97.5	<u>50.9</u>	<u>49.8</u>	<u>46.2</u>	<u>43.9</u>	<u>46</u>
C24	Roadside		N/A	85.3	<u>53.8</u>	<u>49.6</u>	<u>48.5</u>	<u>45.9</u>	<u>52.4</u>
C25	Roadside		N/A	97.5	<u>55.5</u>	<u>53.2</u>	<u>52.9</u>	<u>45.3</u>	<u>50.2</u>
C27	Roadside		N/A	97.5	<u>41.8</u>	38.7	39.8	37.6	39.5
C28	Roadside		N/A	89.1	<u>47.7</u>	<u>51.6</u>	<u>44.6</u>	<u>44.6</u>	<u>43.1</u>
C29	Roadside		N/A	82.0			30.8	30.4	35
E01	Roadside		N/A	51.1	<u>41.0</u>	<u>42.8</u>	37.6	33.8	37.8
E02	Roadside		N/A	95.3	<u>44.0</u>	<u>48.2</u>	<u>41.2</u>	39	<u>41.3</u>
E02-2012	Roadside		N/A	87.9	<u>46.4</u>	<u>50.7</u>	39.7	<u>41.5</u>	<u>42.2</u>
E06	Roadside		N/A	95.5	39.7	<u>41.2</u>	38.6	35.6	37.6
E07-2012	Roadside		N/A	88.5	<u>67.4</u>	<u>65.8</u>	60	<u>54.9</u>	<u>57.4</u>
E08	Roadside		N/A	95.3				<u>57.1</u>	<u>55.4</u>
E10	Roadside		N/A	80.1				<u>45.4</u>	<u>40.9</u>
E12	Roadside		N/A	95.3	<u>47.2</u>	<u>47.6</u>	<u>46.9</u>	<u>45.2</u>	<u>45.6</u>
E14	Roadside		N/A	95.3	<u>46.6</u>	<u>43.8</u>	39.2	35.7	37.4
E15-2012	Roadside		N/A	56.8	<u>47.4</u>	<u>46.5</u>	<u>44.4</u>	39.7	<u>43.7</u>
E16	Roadside		N/A	97.3	<u>46.0</u>	<u>45.5</u>	<u>41.9</u>	37.5	<u>42.4</u>
E16-2015	Roadside		N/A	91.5				<u>42.7</u>	<u>49.3</u>
E17	Roadside		N/A	97.3	<u>51.7</u>	<u>44.8</u>	<u>52.3</u>	<u>51</u>	<u>46.1</u>
E17-2015	Roadside		N/A	97.3				36.5	37.8
E18	Roadside		N/A	97.3	<u>43.5</u>	<u>42.2</u>	<u>40.5</u>	35.4	<u>43.6</u>

E21	Roadside	DT Continued	100	15.3	38.4	36.5	28.6	26.4	27.5
E22	Roadside		N/A	97.5	42.5	44.5	39.7	31.6	39.1
E23	Roadside		N/A	97.5	46.2	47	41.3	37.7	38.4
E24	Roadside		80	62.1					32.4
BH6 Triplicate	Kerbside		N/A	96.1		48.1	49.6	40.6	42.3
W01	Roadside		N/A	97.5	46.8	42.7	47.9	41.3	45.7
W02	Roadside		N/A	92.6			38.1	34.5	37.9
W03	Roadside		N/A	100	52.6	53.1	54.3	42.2	40.4
W04	Roadside		N/A	100	46.8	48.2	46.6	38.4	42
W05	Roadside		N/A	100	42.6	55.3	50.6	46.3	47.2
W07-2014	Kerbside		N/A	100			40.4	34.3	38.2
W08	Roadside		N/A	100	39.9	39.9	41	38	38.8
W10	Roadside		N/A	72.9	57.0	55.8	50	42.9	41.9
W12-2012	Roadside		N/A	64.3	41.0	36.8	38.3	32.7	34.5
W15-2015	Roadside		57	68.1					25.5
W15-2016	Roadside		100	24.7					35.5
W16	Roadside		N/A	81.4	47.9	45	38.2	40.1	37.8
W17	Roadside		N/A	100	41.8	50.2	45.1	41.5	42.4
W18	Urban Background		N/A	100	22.8	23	20.1	21	19.8
W19	Roadside		N/A	100	52.1	51.1	44.8	39.7	40.2
W21	Roadside		N/A	100	45.8	47.7	44.5	37.2	40.1
W22	Roadside		N/A	100			43.7	37.8	37.2

- Diffusion tube data has been bias corrected
- Annualisation has been conducted where data capture is <75%
- If applicable, all 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**.

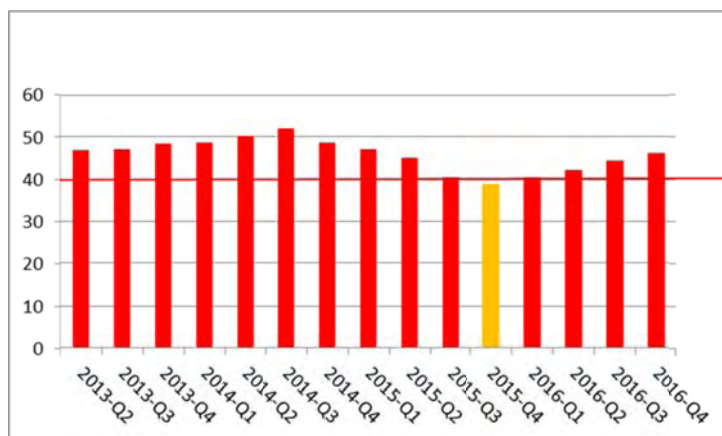
(1) Data capture for the monitoring period, in cases where monitoring was only carried out for part of the year.

(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%).

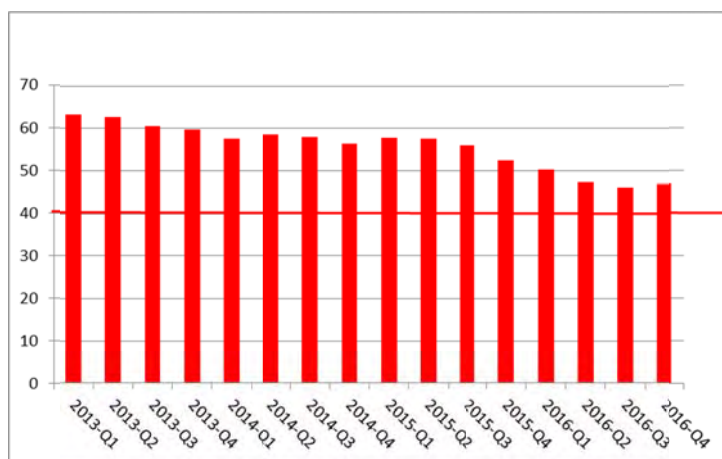
(3) Means for diffusion tubes have been corrected for bias. All means have been “annualised” as per Boxes 7.9 and 7.10 in LAQM.TG16 if valid data capture for the full calendar year is less than 75%. See Appendix C for details.

Figure A.1 – Trends in Annual Mean NO₂ Concentrations

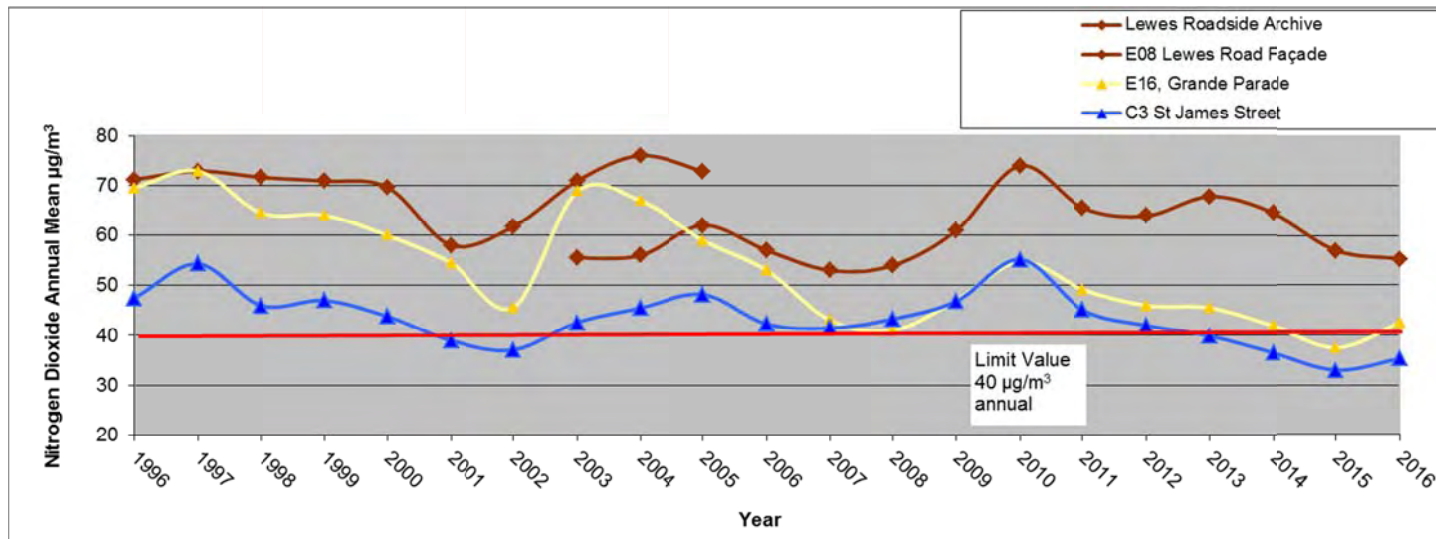
BH6 Lewes Road Automatic Analyser - Quarterly Twelve Month Rolling Mean µg/m³ (2016 Data Capture 99.8%)



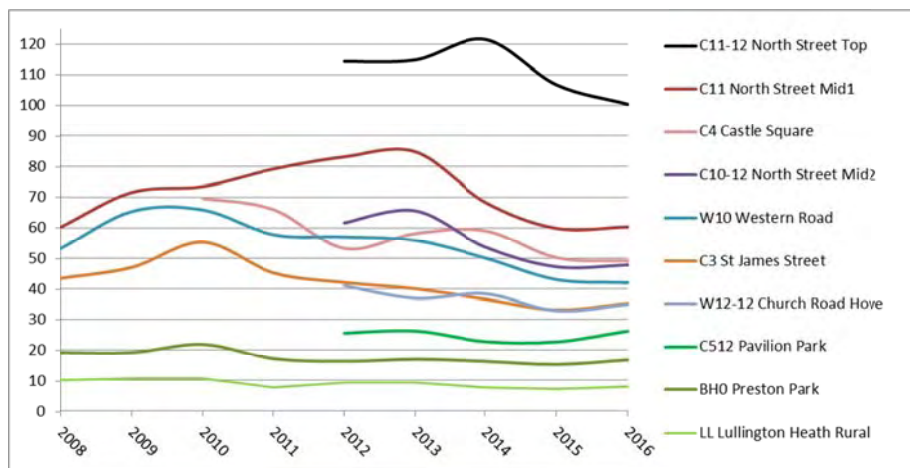
BH10 North Street Automatic Analyser - Quarterly Twelve Month Rolling Mean µg/m³ (2016 Data Capture 98.9%)



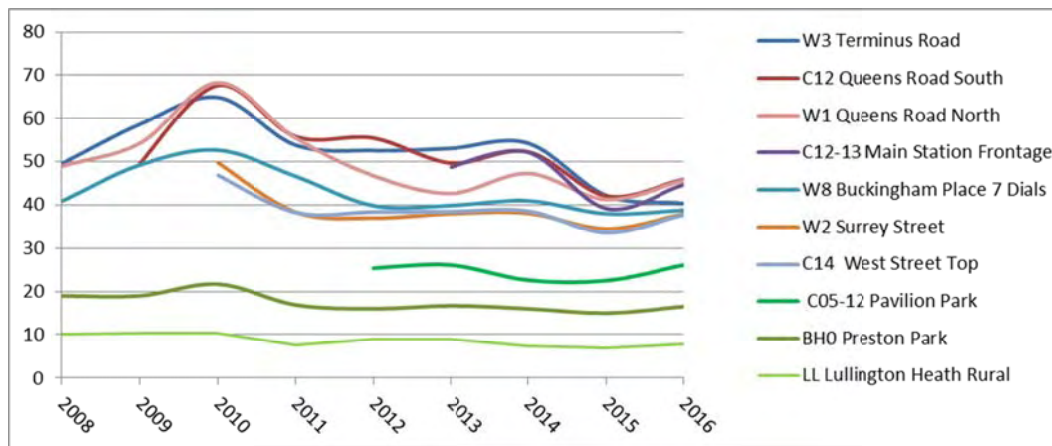
Long Term Diffusion Tube Trend (1996-2016)



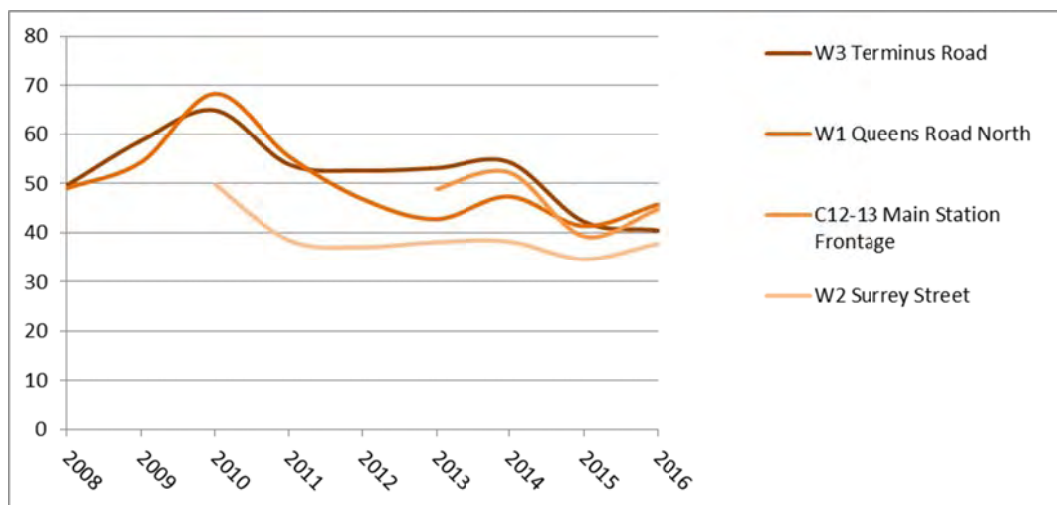
1 Low Emission Zone North Street and Surroundings (Monitors Adjacent to Roads B2066 & B2118)



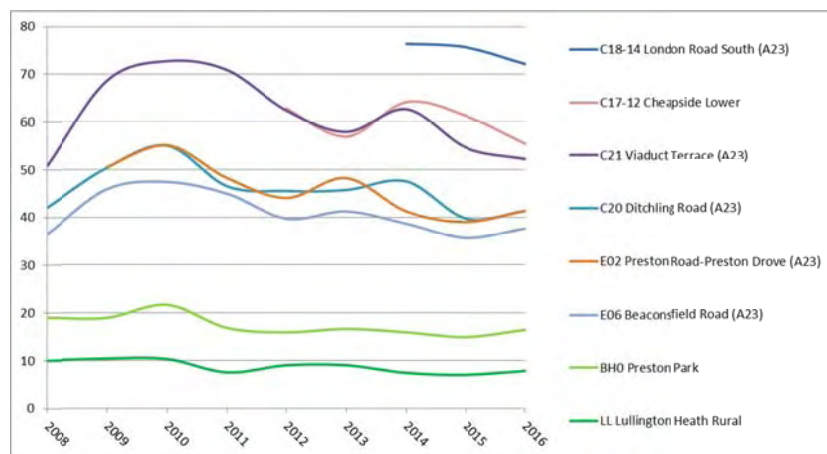
2 Queens Road to Seven Dials (A2010)



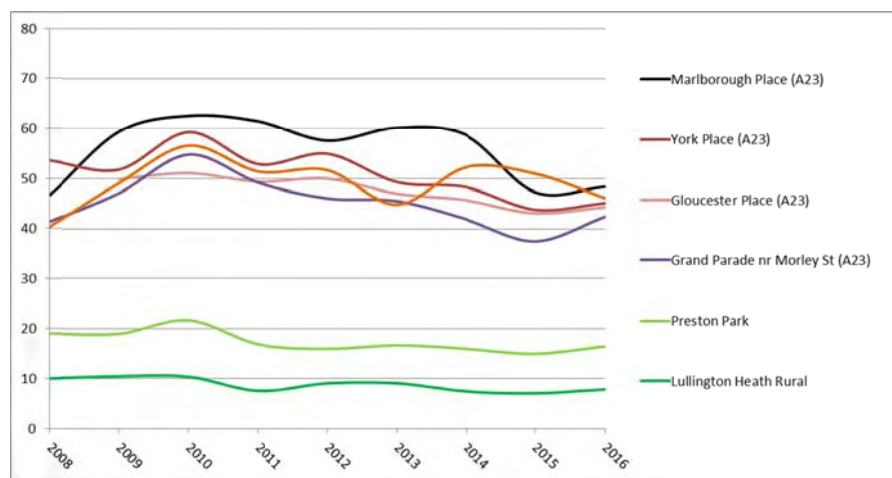
3 Main Railway Station South and West Sides (A2010)



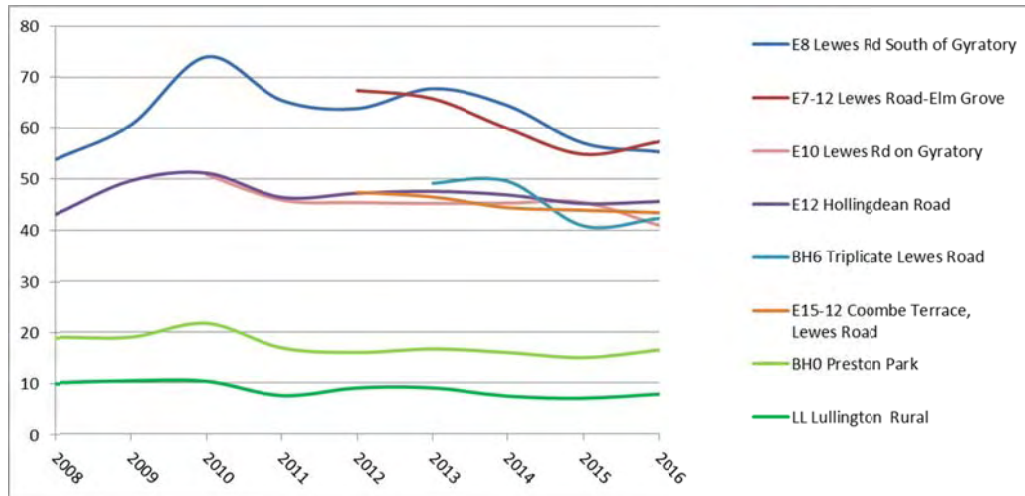
4 North of Valley Gardens (A23)



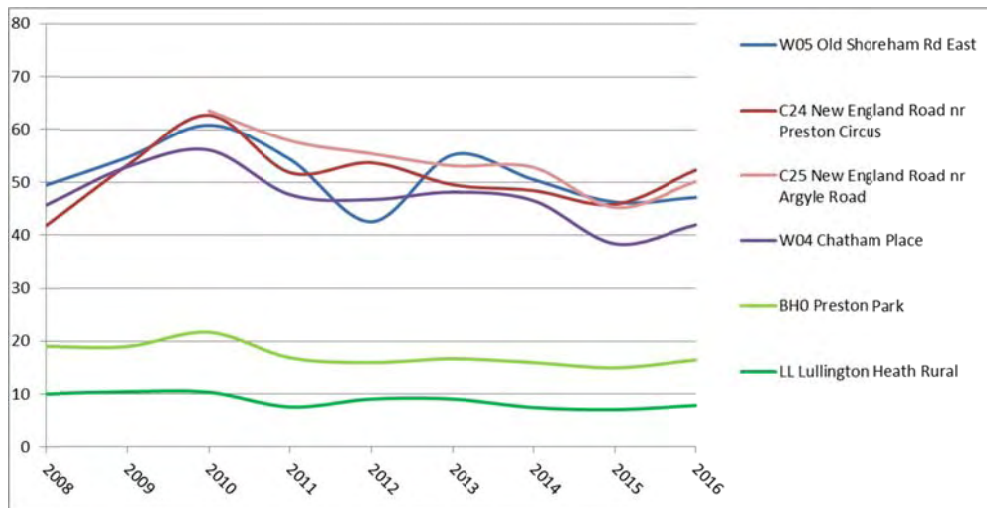
5 Valley Gardens (A23)



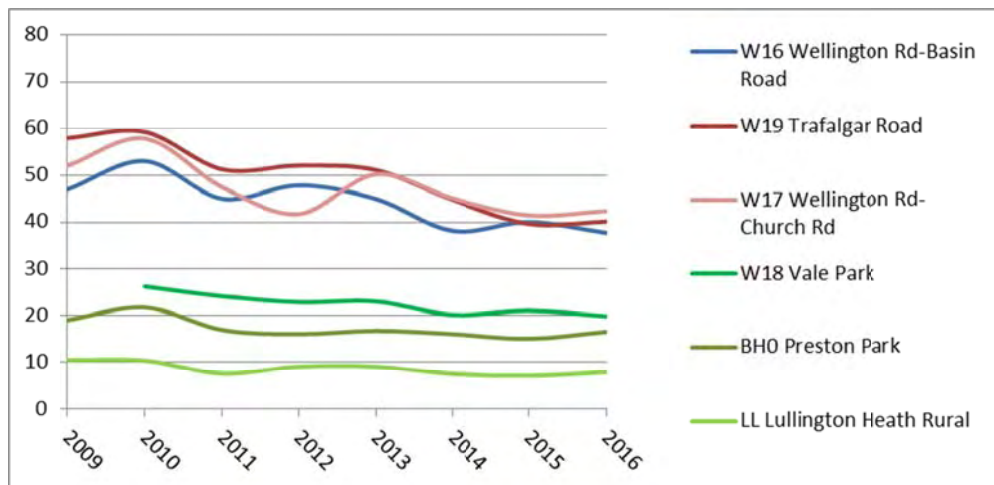
6 Lewes Road Area (A270 Including Holligdean Road C-Classification)



7 New England Road Area (A270)



8 Portslade (A259 & B2193)



9 Rottingdean (A259 & B2123)

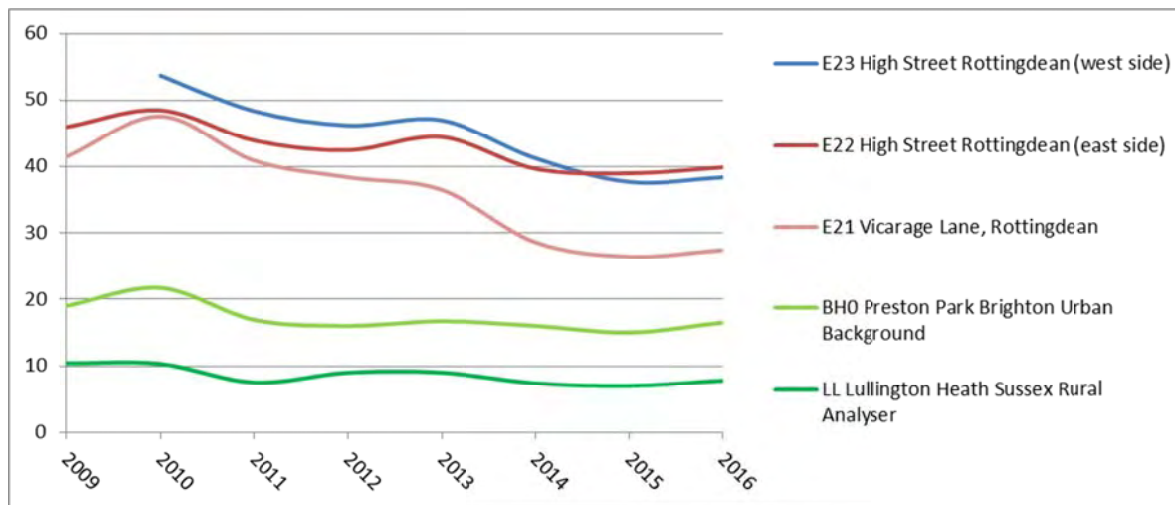


Table A.4 – 1-Hour Mean NO₂ Monitoring Results

Site ID	Site Type	Monitoring Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	NO ₂ 1-Hour Means > 200µg/m ³ ⁽³⁾				
					2012	2013	2014	2015	2016
BH6	Roadside	Automatic	N/A	99.8	6	17	33	1	0
BH10	Roadside	Automatic	N/A	98.9	32	11	8	13	0

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.

Figure A.2 – Trends in Number of NO₂ 1-Hour Means > 200µg/m³

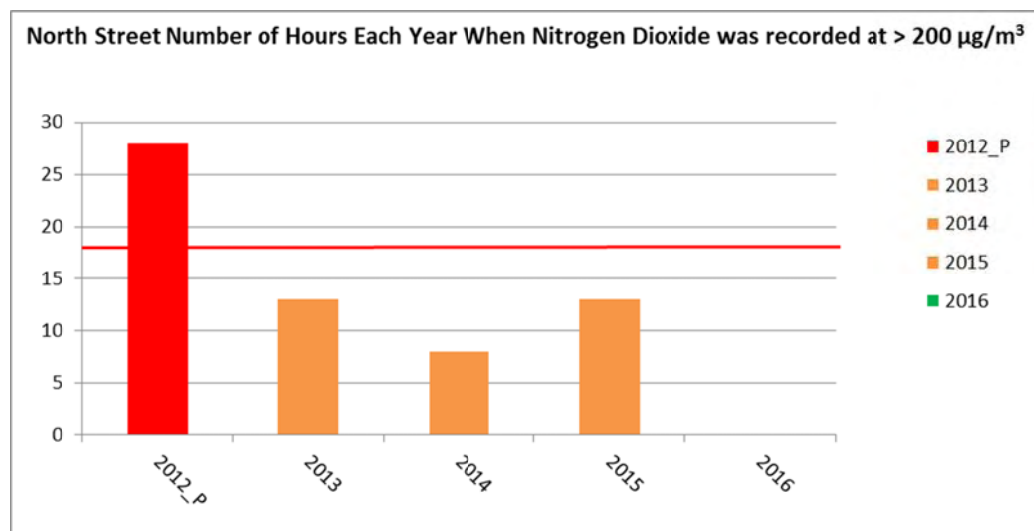
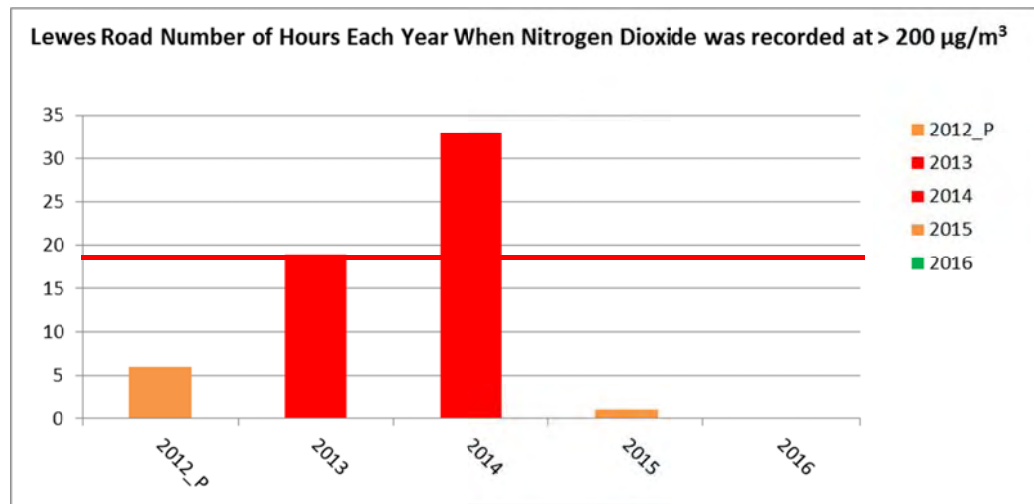


Table A.5 – PM_{2.5} Monitoring Results

Site ID	Site Type	Valid Data Capture for Monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	PM _{2.5} Annual Mean Concentration (µg/m ³) ⁽³⁾				
				2012	2013	2014	2015	2016
BH6	Roadside	N/A	97.3				6.8	7.2
BH10	Roadside	N/A	93.9				13	11
BH0 AURN	Suburban Park	N/A	87	10.9	11.2	9.6	9.3	9

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.

Table A.6 – SO₂ Monitoring Results

Site ID	Site Type	Valid Data Capture for monitoring Period (%) ⁽¹⁾	Valid Data Capture 2016 (%) ⁽²⁾	Number of Exceedances 2016 (percentile in bracket) ⁽³⁾		
				15-minute Objective (266 µg/m ³)	1-hour Objective (350 µg/m ³)	24-hour Objective (125 µg/m ³)
UB	Suburban	?	?	0	0	0

Notes:

Exceedances of the SO₂ objectives are shown in **bold** (15-min mean = 35 allowed a year, 1-hour mean = 24 allowed a year, 24-hour mean = 3 allowed a year)

(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 relevant percentiles are provided in brackets.

Appendix B: Full Monthly Diffusion Tube Results for 2016

Table B.1 – NO₂ Monthly Diffusion Tube Results - 2016

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 (factor) and Annualised ⁽¹⁾	Distance Corrected to Nearest Exposure ⁽²⁾	
C03	38.0	42.8	34.6	38.7	36.9	29.7	31.6	32.6		46.5	43.9	45.5	38.3	35.3	35.3	
C03-2015	43.1			47.2	41.8	42.3	41.2	34.5	40.9	47.6	47.1	53.5	43.9	40.2	37.1	
C04	51.8	62.0	50.7	52.6	48.9	53.2	57.2	44.7	51.4	55.0	60.3	45.5	53.4	49.0	49.0	
C05-2012	29.8	30.6	27.1				15.2	21.7	23.4	31.1	23.9		25.3	26.1	26.1	
C08	33.5	38.8	31.9	34.8	38.0	26.8	30.1	30.4	27.6	42.6	42.2	44.1	35.1	32.4	32.4	
C09	51.4	61.5	46.2	52.2	50.8	48.3	53.2	56.2	49.5	52.5	53.2	57.6	52.7	48.4	48.4	
C10-2012 T1	50.3	58.5	51.0	53.0	54.4	52.9	50.7	46.6	48.4	55.7	49.6	57.8	52.4	48.2	48.2	
C10-2012 T2	48.7	57.0	50.5	59.1	53.8	52.7	51.0	48.9	45.9	51.3	53.5	55.7	52.3	48.2	48.2	
C10-2012 T3	52.2	56.9	46.7	53.4	57.3	50.3	51.8	46.6	51.4	55.0	57.0	52.7	52.6	48.5	48.5	
C11	66.0	72.7	59.5	57.9	67.1	79.1	70.0	48.6	62.6	65.6	68.4	65.2	65.2	60.3	60.3	
C11-2012	106.6	114.0	94.2	109.8		139.1	113.8	128.7	100.3	97.6	103.1	90.8	108.9	100.3	100.3	
C12	50.3	54.2	49.6	48.9		50.9	43.0	44.1	50.8	52.9	52.8	51.8	49.9	45.9	45.9	
C12-2013	53.1	50.2	44.5	43.5	45.3	50.6	38.8	38.9	48.3	56.1	64.1	50.7	48.7	44.7	44.7	
C13-2014	43.9	47.0	40.1	43.4	48.4	45.1	41.4	42.0	41.8	49.8	48.7	48.6	45.0	41.5	41.5	

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C14			41.3	42.3	43.9	33.3	28.6	32.0	38.9	56.3	42.5	48.0	40.7	37.7	37.7
C15	45.6	57.0	39.3	45.6	43.7	50.0	48.8	56.1	44.9	48.6	51.7	48.9	48.3	44.3	44.3
C16	49.0	60.8		45.6	43.6	47.7	45.5	54.1	46.3	45.7	50.3	54.5	49.4	45.1	45.1
C17-2012	53.7	70.7	53.3	67.1	60.8	60.5	60.2	65.2	62.4		68.5	75.6	63.5	58.3	58.3
C18-2014	65.1	95.3	61.6	74.8		84.4	95.1	92.5	70.4	76.5	74.3	78.0	78.9	<u>72.2</u>	<u>72.2</u>
C18	64.7	89.9	59.2	67.1	77.6	59.2	60.0	81.3				70.0	69.9	<u>64.3</u>	<u>64.3</u>
C19	43.8	52.4	42.7	47.4	48.2	42.7	45.1	49.6	41.1	53.9	53.6	50.7	47.6	43.8	43.8
C20	43.8	49.0	40.1	42.9	31.1	37.5	37.3	48.4	41.6	58.3	54.7	54.0	44.9	41.3	41.3
C21	58.0	58.3	42.6	54.4	53.3	53.2	53.7	69.5	56.3	55.6	58.1	65.3	56.5	52.2	52.2
C23	52.4	59.7	38.1	53.9	41.0	47.9	52.9	52.6	47.0	49.2	51.2	64.4	50.9	46.0	46.0
C24			43.0	46.6	57.0	48.2	47.4	51.3	48.6	65.8	65.0	49.8	52.2	52.4	52.4
C25	49.6	65.0	43.3	50.8	54.6	54.0	51.1	69.4	53.0	55.4	53.9	54.9	54.6	50.2	50.2
C27	37.0	48.2	35.7	39.9	41.7	38.1	47.0	42.5	41.1	46.8	49.3	48.1	42.9	39.5	39.5
C28		59.8	39.0	43.6	41.7	47.9	37.4	51.5	39.5	47.9	54.0	55.5	47.0	43.1	43.1
C29	30.9	36.8	38.8	38.5	36.5			28.4	30.7	49.1	42.6	44.5	37.7	35.0	35.0
E01		44.0	40.6	40.4	42.6							52.5	44.0	37.8	37.8
E02	35.2	48.3	38.3	46.2	45.0		37.5	40.9	43.9	48.5	51.5	55.9	44.6	41.3	41.3
E02-2012	43.4	51.1	45.4	47.3	46.2		38.9	36.2	47.2	45.2		61.0	46.5	42.2	42.2
E06	36.1	46.4	36.7	44.5	35.9		35.0	36.1	40.5	43.9	46.1	52.9	41.3	37.6	37.6
E07-2012	47.8	69.6	61.7	67.1	66.7		44.3	52.2	58.0	75.2		72.0	61.5	57.4	57.4
E08	53.6	68.0	52.1	65.9	60.7		48.8	54.9	54.9	68.6	65.5	66.3	59.9	55.4	55.4
E10	38.0		42.0	50.9	43.4		37.2	37.5	44.3		59.7	49.7	44.7	40.9	40.9
E12	38.0	52.6	46.3	54.7	52.3		40.3	53.5	52.6	51.8	41.2	53.5	48.8	45.6	45.6
E14	31.5	43.8	39.8	40.6	36.7		32.2	33.4	42.5	42.6	54.4	53.5	41.0	37.4	37.4
E15-2012			41.9	48.1	48.1		33.1				62.1	49.6	47.2	43.7	43.7
E16	36.0	40.8	42.9	42.6	47.8	45.3	38.4	48.3	51.4	52.7	54.6	50.0	45.9	42.4	42.4
E16-2015		45.5	42.3	54.4	59.7	47.9	44.3	60.0	52.5	59.5	63.7	57.0	53.3	49.3	49.3

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E17	40.0	41.0	49.1	51.9	61.8	48.9	37.4	55.8	52.5	55.6	53.6	50.4	49.8	46.1	46.1
E17-2015	35.8	40.5	36.9	43.3	42.3	40.7	34.7	40.1	39.3	45.5	49.0	43.4	40.9	37.8	37.8
E18	43.5	47.1	40.5	53.6	47.3	47.9	40.0	41.7	48.1	56.1	52.6	50.2	47.4	43.6	43.6
E21	28.0	30.9											27.4	27.5	27.5
E22	40.0	42.2	37.4	40.9	43.5	38.4	39.8	40.5	46.2	44.3	46.4	49.0	42.4	39.1	39.1
E23	32.0	38.4	39.7	50.4	46.7	47.0	32.8	43.4	36.9	44.3	48.1	39.2	41.6	38.4	38.4
E24			37.9	35.9	43.5	30.8	21.3		29.0		42.8	38.0	34.9	32.4	32.4
BH6 T1			46.0	48.4	39.4		40.2	35.9	54.2	55.3	43.2	52.8	46.2	42.0	40.2
BH6 T2	45.3		44.4	50.1	46.0		37.1	37.7	53.9	42.2	47.0	55.7	46.3	42.5	40.7
BH6 T3	44.1		46.1	44.7	42.6		41.8	40.8	55.6	41.4	43.7	60.1	46.1	42.4	40.6
W01	46.7	53.4	41.2	50.4	54.2	47.9	44.3	42.0	45.2	62.6	52.5	51.8	49.4	45.7	45.7
W02	41.4	37.5	53.8	39.5	42.6	37.1	37.6	32.7			55.0	40.3	41.8	37.9	37.9
W03	50.6	40.9	49.9	38.9	43.4	38.7	41.7	36.0		54.4	51.7	50.5	45.2	40.4	40.4
W04	42.9	46.6	44.4	39.9	41.6	46.9	47.4	38.1		57.1	55.2	48.4	46.2	42.0	42.0
W05	45.3	49.2	55.8	47.5	47.5	43.6	54.8	46.0		65.9	64.0	54.0	52.1	47.2	47.2
W07-2014	45.1	35.5	44.3	31.3	36.6	34.8	43.3	38.5		46.5	46.9	46.2	40.8	38.2	38.2
W08	53.6	36.1	33.5	34.2	34.9	39.7	43.8	33.4		40.9	58.2	46.2	41.3	38.8	38.8
W10	48.3	40.4	43.3	40.6	42.8	44.8	55.6					47.4	45.4	41.9	41.1
W12-12	40.1			29.1			24.7	32.8				43.1	42.3	35.3	34.5
W15-15	24.6		31.4			23.2	23.0						25.6	25.5	25.5
W15-16											39.3	41.9	40.6	35.5	35.5
W16	25.3	36.2	35.7	36.8	39.9	43.9	52.1	39.1		46.8	40.3	43.5	41.4	37.8	37.8
W17	33.7	45.0	50.9	40.7	45.4	41.9		39.6		58.7	60.5	60.7	47.7	42.4	42.4
W18	20.5	21.3	22.1	17.5	17.0	17.6	15.5	16.5		28.7	30.4	28.7	21.6	19.8	19.8
W19	42.3	47.8	45.5		41.5	41.3	47.0	37.4		53.4	52.1	48.9	45.7	41.2	41.2
W21	41.6	40.7	43.8	39.4	40.4	36.8	39.7	36.4		52.6	53.6	57.4	43.9	40.1	40.1

W22	31.9	40.8	50.1	41.2	42.2	33.4	43.2	35.2		52.2		44.3	41.5	37.2	36.1
-----	------	------	------	------	------	------	------	------	--	------	--	------	------	------	------

Local bias adjustment factor used

National bias adjustment factor used

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) 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

In the past twelve months construction activity has started on the Royal Sussex County Hospital. At the same time American Express are demolishing their former European Headquarters (new offices already adjacent). Both activities are likely to influence traffic emissions in the vicinity of Eastern Road a C-road carrying approximately 17,000 vehicles a day. Monitoring in the area is within the existing AQMA and shows a small increase in 2016-NO₂ compared with 2015 (this appears to be more localised than the small regional increase monitored across a number of local authorities). The construction activity scheduled until 2026 it is not expected to require declaration of a new AQMA – but could delay revocation of the existing area. The Circus Street site demolition is part of university growth and development. At the time of writing construction activity on this site with full planning permission is delayed.

Further improvement in NO₂ is required across a large area of Portslade and Hove. It is more likely than Brighton City Centre that this part of the AQMA could be revoked by 2020.

All tubes have been corrected using National Physical Laboratories (NPL) calculation utilising Brighton & Hove City Council's diffusion tube triplicate co-location with the automatic analyser at site BH10 on North Street. For 2016 the correction factor used was 0.92 which compares to 0.91 for the previous year. The vast majority Diffusion Tubes are on the façade of the building line. Triangular Distance from the road carriageway to the monitor is one to eight metres. Within the AQMA Brighton & Hove has high population density and residential dwellings that are less than eight metres of roads. Where monitors are not at a relevant location for public exposure these have been corrected for distance in accordance with the LAQM Technical Guidance (TG 2016).

Appendix D: Map(s) of Monitoring Locations

Area maps of 2016 NO₂ diffusion tubes and annotated results

Figure 3 2016 NO₂ Diffusion Tubes Portslade and Hove



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Figure 4 2016 NO₂ Diffusion Tubes Preston Park and Preston Drove



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Figure 5 2016 NO₂ Diffusion Tubes Low Emission Zone and Surroundings



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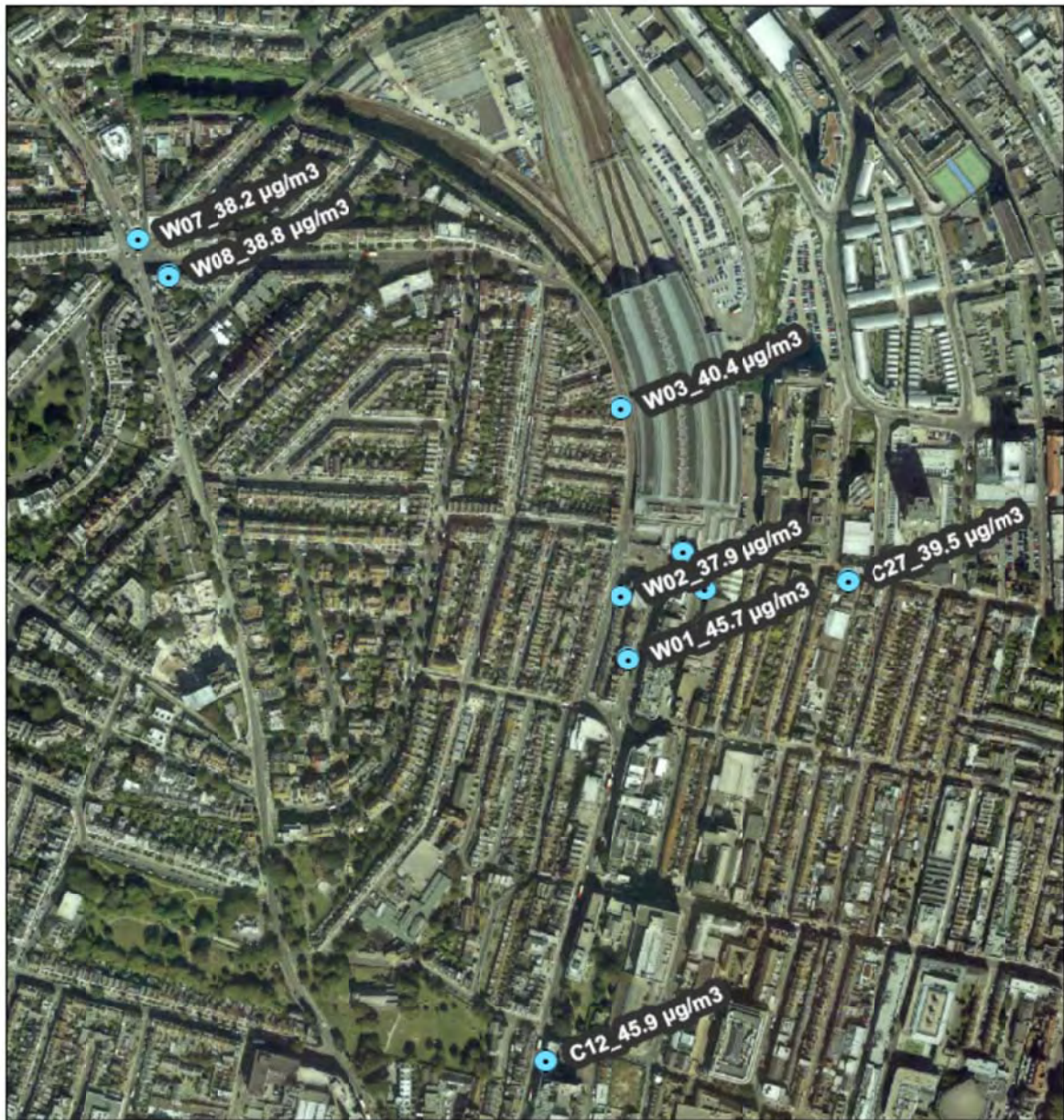


Figure 6 2016 NO₂ Diffusion Tubes Preston Circus Area



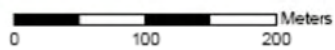
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Figure 7 2016 NO₂ Diffusion Tubes Queens Road Area



Legend

● Diffusion_Tubes_2016



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Figure 8 2016 NO₂ Diffusion Tubes Main Railway Station Area



Legend
● Diffusion_Tubes_2016

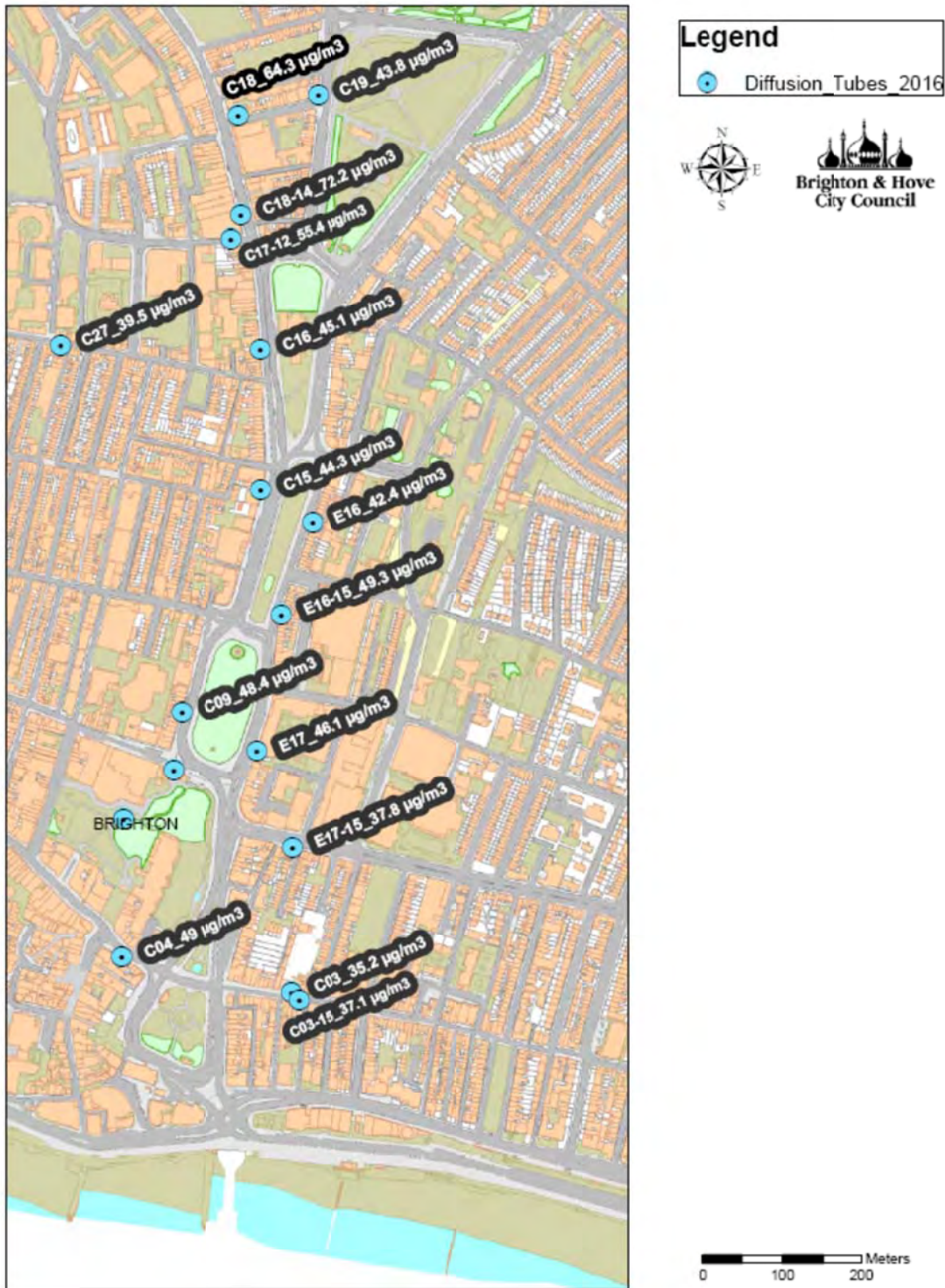


0 20 40 80
Meters



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Figure 9 2016 NO₂ Diffusion Tubes Valley Gardens Area



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Figure 10 2016 NO₂ Diffusion Tubes Lewes Road Area



Legend
 Diffusion Tubes 2016



0 100 200 400 Meters



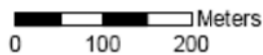
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Figure 11 2016 NO₂ Diffusion Tubes Sussex Royal County Hospital Area



Legend

- Diffusion_Tubes_2016



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Figure 12 2016 NO₂ Diffusion Tubes Rottingdean



Legend
● Diffusion_Tubes_2016



0 15 30 60 Meters



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Appendix E: Summary of Air Quality Objectives in England

Table E.1 – Air Quality Objectives in England

Pollutant	Air Quality Objective ¹⁴	
	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

¹⁴ The units are in microgrammes of pollutant per cubic metre of air (µg/m³).

Glossary of Terms

Abbreviation	Description
ADMS	Atmospheric Dispersion Model System
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 objectives or legally binding standards.
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'
AQS	Air Quality Strategy
ASR	Annual Status Report for Air Quality
AURN	Automatic Urban and Rural Network (UK air quality monitoring network)
AQS	Air Quality Strategy
BAM	Beta Attenuation Monitor (particulate monitoring method)
BH6	Brighton & Hove Automatic Air Analysers on Lewes Road
BH10	Brighton & Hove Automatic Air Analysers on North Street
BREEAM	Building Research Establishment Environment Assessment Methodology
BHCC	Brighton and Hove City Council (unitary authority)
BQPA	Bus Quality Partnership Agreements
C01	Diffusion Tubes Monitor in Central Brighton second number after "C" denotes if the monitor started during a recent year for example C18-14 (Central Monitor started 2014).
CAZ	Clean Air Zone
CBTF	Clean Bus Transport Fund (DfT)
CEMP	Construction Environment Management Plan

CIL	Community Infrastructure Levy
COMEAP	Committee on the Medical Effects of Air Pollutants
CVTF	Clean Vehicle Transport Fund (DfT)
Defra	Department for Environment, Food and Rural Affairs
DMRB	Design Manual for Roads and Bridges – Air quality screening tool produced by Highways England
DPF	Diesel Particulate Filter
E1	Diffusion Tubes Monitor in East Brighton second number after “E” donates if the monitor started during a recent year for example E16-15 (East Monitor started 2015).
EU	European Union
FDMS	Filter Dynamics Measurement System
GIS	Geographical Information Systems
HGV	Heavy Goods Vehicles
JSNA	Joint Strategic Needs Assessment
KERS	Kinetic Energy Recovery System
LAQM	Local Air Quality Management
LDV	Light Duty Vehicles
LDF	Local Development Framework
LEP	Local Enterprise Partnership
LEZ	Low Emission Zone
LSTF	Local Sustainable Transport Fund
LTP4	Local Transport Plan 4
LCVP	Low Carbon Vehicle Partnership
NICE	The National Institute for Health Care Excellence

NO ₂	Nitrogen Dioxide
NO _x	Nitrogen Oxides
NPL	National Physical Laboratory
NPPF	National Planning Policy Framework
O ₃	Ozone near ground level
OLEV	Office of Low Emission Vehicles
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
PAH	Poly Aromatic Hydrocarbons
PHE	Public Health England
QA/QC	Quality Assurance and Quality Control (referring to air monitoring data)
S106	Developer Funding under Town and Country Planning Act 1990
SAQP	Sussex Air Quality Partnership
SCRT	Selective Catalytic Reduction Technology (fitted to vehicle exhausts)
SO ₂	Sulphur Dioxide
TEA	Triethanolamine in water (laboratory method for NO _x diffusion tubes)
TEOM	Tapered Element Oscillating Microbalance (particulate monitoring method)
TRO	Traffic Regulation Order
µg/m ³	Concentration in micrograms per cubic meter
W01	Diffusion Tubes Monitor in West Brighton & Hove second number after "W" denotes if the monitor started during a recent year for example C07-14 (West Monitor started 2014).

References

Defra References

Environmental equity, air quality, socioeconomic status and respiratory health, 2010

Air quality and social deprivation in the UK: an environmental inequalities analysis, 2006

Defra. Abatement cost guidance for valuing changes in air quality, May 2013

Air Quality: A Briefing for Directors of Public Health March 2017 A Local Government Publication Defra and Public Health England found at: <http://www.adph.org.uk/2017/03/air-quality-a-briefing-for-directors-of-public-health/>

Brighton & Hove References

Brighton & Hove City Council Joint Strategic Needs Assessment found at: <http://www.bhconnected.org.uk/sites/bhconnected/files/6.4.9%20Air%20Quality%20JSNA%202016.pdf>

Brighton & Hove 2015 Air Quality Action Plan found at: <http://www.brighton-hove.gov.uk/content/environment/air-quality-and-pollution/air-quality-management-city>

Big Lemon Electric Buses found at: <https://thebiglemon.com/>

Withdean Stadium Electric Charging Point found at: <https://www.zap-map.com/pts/neqhzd1/>

Access Fund for Sustainable Transport found at: <https://www.brighton-hove.gov.uk/content/parking-and-travel/travel-transport-and-road-safety/access-fund-sustainable-travel-brighton>

Local Lift Share Options found at: <https://liftshare.com/uk/journeys/from/brighton>

Journey Planner found at: <http://www.brighton-hove.gov.uk/journeyplanner/>

Brighton & Hove AQMA found online at: https://uk-air.defra.gov.uk/aqma/local-authorities?la_id=35

Preston Park AURN results found at: <https://uk-air.defra.gov.uk/networks/network-info?view=aur>

Further references can be found in previous Local Air Quality Management Reports including the 2015 Air Quality Action Plan online link given above.